ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT FOR

TAUNG THAMAN RESORT PROJECT

(BOOK No. 1)

PREPARED BY:

OSHE SERVICES COMPANY LIMITED

PREPARED FOR:

TAUNG THAMAN THITSAR COMPANY LIMITED

FEBRUARY, 2024

LETTER OF ENDORSEMENT BY THE PROJECT PROPONENT

This Environmental Impact Assessment Report for "Taung Tha Man Resort Project" Project was prepared by OSHE Services Company Limited on behalf of Taung Tha Man Thit Sar Company Limited. I hereby issue my letter of endorsement to confirm:

(a) the accuracy and completeness of the EIA.

(b) that the EIA has been prepared in strict compliance with applicable laws including the EIA Procedure 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 EIA Report.

Signed

Name : **Kyaw Myint**

Position : **Managing Director.**

Organization : **Taung Tha Man Thit Sar Co., Ltd**

OSHE Services Co., Ltd.

Your Trusted Advisor for Occupational Safety, Health & Environmental Solutions

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COMMITMENT OF THIRD PARTY

This Environmental Impact Assessment Report has been done with reasonable skills, care and diligence in accordance with the stipulations of Environmental Conservation Law 2012, Environmental Conservation Rules (2014) and EIA Procedures (2015). I hear by signed this report on behalf of OSHE Services Company Limited to certify that all the information in it are true and convincing to the best of our knowledge.

Signed

Name : **U Soe Myint (Team Leader)**

Position : Executive Director

Organization : OSHE Services Company Limited

Sector-wise Participants

Sr.	Name	Expertise Area
1	U Soe Myint (Team Leader)	Project Management, Socio-Economy & OSH
2	U Yan Naing Aung	Waste Management, Impact Assessment & Mitigation Plan
3	U Khin Maung Maung	Construction Project Analysis & Urban Planning
4	U Khin Maung Htaey, U Yan Naing Aung	Water Sanitation and Wastewater Management
5	U Hla Baw	Water Resources Analysis
6	U Kyaw Zin Lat U Hla Myo Aung	Geological Assessment
7	Daw Htay Htay Win	Soil Assessment
8	Dr. Myo Myint Dr. Zaw Khaing Oo Dr. ReeMon Htun	Biodiversity Assessment
9	Dr. Aung Lay Tin , U Myint Maung Maung Than	Noise & Vibration Air Quality Assessment
10	Dr. Than Htay Oo Dr. Maung Maung Hlaing	Cultural Heritage Impact Assessment
11	Dr. Htin Lin Dr. Aye Hnin Hnin Naing	Traffic Impact Analysis
12	U Lin Thura Aung	Pollution Control Scoping & ToR Drafting, Report Drafing
13	U Soe Myint Dr. Thura Kyaw	Public Consultation & Social Survey
14	U Aung Kyaw Lin	Legal Analysis
15	Dr. Myo Nyunt U Yan Naing Aung U Thet Paing Zaw U Linn Thura Aung	Impact Assessment, Mitigation Measures & Environmental Management Plan
16	U Ye Yint U Wai Yan	Monitoring Schedules, Budgetting, and Report Drafting

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATION

BOD	= Biological Oxygen Demand
˚C	= Degree Celsius
CO	= Carbon monoxide
COD	= Chemical Oxygen Demand
CSH	= Community Safety and Health
CSR	= Cooperate Social Responsibility
dB	= Decibel
DO	= Dissolved Oxygen
EA	= Environmental Assessment
ECC	= Environmental Compliance Certificate
ECD	= Environmental Conservation Department
ECL	= Environmental Conservation Law
ECRs	= Environmental Conservation Rules
EHS	= Environmental, Health, and Safety
EIA	= Environmental Impact Assessment
EMP	= Environmental Management Plan
EMoP	= Environmental Monitoring Plan
GHG	= Greenhouse gases
IEE	= Initial Environmental Examination
IFC	= International Finance Corporation
INGOs	= International Non-Government Organizations
ILO	= International Labour Organization
km	= Kilometer
MONREC	= Ministry of Natural Resources and Environmental Conservation
MEMs	= Mitigation and Enhancement Measures
MITC	= Mandalay Industrial and Trade Center
NEQG	= National Environmental Quality Guidelines
NO	= Nitrogen monoxide
NO_2	= Nitrogen dioxides
OSH	= Occupational safety and health
OSHE Services	= Occupational Safety, Health and Environment Services
Pb	= Lead
PCM	= Public Consultation Meeting
PM2.5	= Particle Matter 2.5
PM10	= Particle Matter 10
SO2	= Sulfur dioxide
ToR	= Term of References
TW	= Tubewell
UNEP	= United Nations Environment Programme
WHO	= World Health Organization

အကျဉ်းချုပ်အစီရင်ခံစာ

၁။ စီမံကိန်းနောက်ခံအကြောင်းအရာ

တောင်သမန်သစ္စာကုမ္ပဏီလီမိတက်အနေဖြင့် မန္တလေးတိုင်းဒေသကြီး၊ အမရပူရ မြို့နယ်၊ တောင်သမန်ကျေးရွာအနီးတွင် မြန်မာ့ရိုးရာယဉ်ကျေးမှုနှင့် တောင်သမန်ကျေးလက်ခရီးသွားအပန်းဖြေစခန်း (Resort service) ကို အကောင်အထည်ဖော်ဆောင်ရွက်မည် ဖြစ်ပါသည်။ စီမံကိန်းသည် အထင်ကရတောင်သမန်အင်း၏ အရှေ့တောင်ဖက်နှင့် ဦးပိန် တံတား၏ မြောက်ဖက်တွင် တည်ရှိပြီး မြန်မာ့ရိုးရာယဉ်ကျေးမှု အမွေအနှစ်များကို ခရီးသွား လုပ်ငန်းမှတဆင့် ဖော်ထုတ်ပြသနိုင်မည့် အခွင့်အလမ်းကောင်းတစ်ရပ်ဖြစ်ပါသည်။

အထက်ပါ စီမံကိန်းရင်းနှီးမြှုပ်နှံမှုကိုလည်း မြန်မာရင်းနှီးမြှုပ်နှံမှုကော်မရှင် (MIC) မှ ၂၀၁၈ ခုနှစ်၊ မတ်လ ၂၇ ရက်နေ့ရက်စွဲပါ ခွင့်ပြုမိန့်အမှတ် ၀၇၂/ ၂၀၁၈ ဖြင့် အတည်ပြု ပေးခဲ့ပြီးဖြစ်ပါသည်။ စီမံကိန်းသည် ၄၀. ၂၇ ဧကခန့် ကျယ်ဝန်းမည်ဖြစ်ပြီး တောင်သမန် သစ္စာကုမ္ပဏီမှ ကြီးကြပ်၍ ရာနှုန်းပြည့်နိုင်ငံသားရင်းနှီးမြှုပ်နှံမှုဖြင့် လုပ်ငန်း ဆောင်ရွက် လည်ပတ်သွားမည်ဖြစ်ပါသည်။

စီမံကိန်းကြောင့် ဖြစ်ပေါ်လာနိုင်သော ပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာ သက်ရောက်မှုများအပေါ် ဆန်းစစ်လေ့လာချက်တစ်ရပ်ကို OSHE Services ကုမ္ပဏီ လီမိတက်မှ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဥပဒေ (၂၀၁၂)၊ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေး နည်းဥပဒေ (၂၀၁၄) နှင့် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း (၂၀၁၅) တို့နှင့်အညီ ဆောင်ရွက်ခဲ့ပါသည်။ OSHE Services ကုမ္ပဏီလီမိတက်မှ ဆန်းစစ်ဆောင်ရွက်ခဲ့သော စီမံကိန်း၏ နယ်ပယ်အတိုင်းအတာသတ်မှတ်ခြင်းအစီရင်ခံစာကို ပတ်ဝန်းကျင်ထိန်းသိမ်းရေး ဦးစီးဌာန၊ ဦးစီးရုံးချုပ် (နေပြည်တော်) ၏ ၂၀၂၂ ခုနှစ် ဧပြီလ ရ ရက်နေ့ပါ ရက်စွဲဖြင့် စာအမှတ် အီးအိုင်အေ-၁/၃/အတည်ပြု(SR) (၆၀၃/ ၂၀၂၂) ကို ရည်ညွှန်း၍ ပတ်ဝန်းကျင် ထိန်းသိမ်းရေးဦးစီးဌာန၊ ညွှန်ကြားရေးမှူးရုံး မန္တလေးတိုင်းဒေသကြီးမှ ၂၀၂၂ ခုနှစ် မေလ ၃ ရက်နေ့ရက်စွဲပါ စာဖြင့် စိစစ်သုံးသပ်အတည်ပြုခဲ့ပြီးဖြစ်ပါသည်။

၁.၁၊ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း၏ ရည်ရွယ်ချက်များ

တောင်သမန်သစ္စာအပန်းဖြေစခန်းစီမံကိန်း၏ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း ကို OSHE ကုမ္ပဏီလီမိတက် မှ အောက်ပါရည်ရွယ်ချက်များ သတ်မှတ်၍ ဆောင်ရွက်ခဲ့ ပါသည်-

(က) စီမံကိန်း၏ တည်ဆဲဥပဒေများနှင့်အညီ ဆောင်ရွက်ထားရှိမှုကိုစုံစမ်းစစ်ဆေးရန်၊

(ခ) စီမံကိန်းအနီးဝန်းကျင်၏ ပတ်ဝန်းကျင်နှင့် လူမှုစီးပွားရေးဆိုင်ရာ နောက်ခံအကြောင်းအရာများ လေ့လာရန်၊

(ဂ) စီမံကိန်းနှင့် ဆက်စပ်သတင်းအချက်အလက်များကို အများပြည်သူသိရှိနိုင်စေရန်၊

(ဃ) ဖြစ်နိုင်ချေရှိ ပတ်ဝန်းကျင်နှင့် လူမှုစီးပွားဆိုင်ရာ ပြဿနာရပ်များကို ဖော်ထုတ်လေ့လာရန်နှင့်

(င) ပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာ အဓိကသက်ရောက်မှုများအတွက် လျော့ပါးသက်သာစေရန်နှင့် ပိုမိုကောင်းမွန်စေမည့် အစီအမံများ ဖော်ထုတ်သတ်မှတ်ရန်တို့ဖြစ်ပါသည်။

၁.၂ ပတ်ဝန်းကျင်ထိခိုက်မှုလေ့လာဆန်းစစ်သည့်အဖွဲ့အစည်း

တောင်သမန်သစ္စာအပန်းဖြေစခန်းစီမံကိန်း၏ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း အစီရင်ခံစာ လေ့လာဆောင်ရွက်ခဲ့သည့် OSHE Services ကုမ္ပဏီလီမိတက်၏ အချက် အလက် အကျဉ်းချုပ်ကို အောက်ပါဇယားတွင် ဖော်ပြထားပါသည်။ ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း ဆောင်ရွက်ခဲ့သည့် အဖွဲ့၏ အသေးစိတ်အချက်အလက်များကို အစီရင်ခံစာတွင် အပြည့်အစုံ ဖော်ပြထားပါသည်။

ဇယား က၊ တတိယအဖွဲ့အစည်းဆိုင်ရာအချက်အလက်များ

ကုမ္ပဏီအမည်	OSHE Services ကုမ္ပဏီလီမိတက်
လုပ်ငန်းအမျိုးအစား	ပတ်ဝန်းကျင်ဆိုင်ရာအကြံပေး ဝန်ဆောင်မှု
သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာန၏ ကြားကာလ အကြံပေးလုပ်ကိုင်သူ အထောက်အထားလက်မှတ် အမှတ် (TCR No.)	၀၁၈
လုပ်ငန်းတာဝန်	ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း ဆိုင်ရာ စီမံခန့်ခွဲရေးနှင့် နည်းပညာပိုင်းကိစ္စရပ်များ၊ အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်းနှင့် သတင်းအချက်အလက်များ ထုတ်ပြန်ခြင်း၊
ဆက်သွယ်ရန်	လိပ်စာ - အမှတ် (၉၂)၊ ကံ့ကော်မြို့ (၂) လမ်း၊ ၃၃ ရပ်ကွက်၊ မြောက်ဒဂုံ မြို့နယ်၊ ရန်ကုန်။ ဖုန်းနံပါတ် - ၀၉၄၉၁၆၀၂၅၅ အီးမေလ်း - sm260859new@gmail.com

၂။ မူဝါဒ၊ ဥပဒေနှင့် အဖွဲ့အစည်းဆိုင်ရာမူဘောင်

စီမံကိန်းအဆိုပြုသူအနေဖြင့် အောက်ဖော်ပြပါ တည်ဆဲဥပဒေ၊ နည်းဥပဒေနှင့် လုပ်ထုံးလုပ်နည်းများနှင့်အညီ လိုက်နာဆောင်ရွက်၍ စီမံကိန်းကို အကောင်အထည်ဖော် ဆောင်ရွက်သွားမည်ဖြစ်ပါသည်။

- ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဥပဒေ (၂၀၁၂)
- ပတ်ဝန်းကျင်ထိန်းသိမ်းရေး နည်းဥပဒေများ (၂၀၁၄)
- ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း (၂၀၁၅)
- အမျိုးသား ပတ်ဝန်းကျင်အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များ (၂၀၁၅)
- မြန်မာ့ခရီးသွားလုပ်ငန်း ဥပဒေ (၂၀၁၈)
- မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှုဥပဒေ (၂၀၁၆)
- မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှုနည်းဥပဒေများ (၂၀၁၇)
- မြန်မာ့ အာမခံ ဥပဒေ (၁၉၉၃)
- ရေနံနှင့် ရေနံထွက်ပစ္စည်းဆိုင်ရာ ဥပဒေ (၂၀၁၇)
- ပေါက်ကွဲစေတက်သော ပစ္စည်းများ အက်ဥပဒေ (၁၉၀၈)
- လုပ်ငန်းခွင်သုံးပေါက်ကွဲစေတက်သော ဝတ္ထုပစ္စည်းများဆိုင်ရာ ဥပဒေ (၂၀၁၈)
- ယာဉ်အန္တရာယ်ကင်းရှင်းရေးနှင့် မော်တော်ယာဉ်စီမံခန့်ခွဲမှုဥပဒေ (၂၀၂၀)
- ယာဉ်အန္တရာယ်ကင်းရှင်းရေးနှင့် မော်တော်ယာဉ်စီမံခန့်ခွဲမှုနည်းဥပဒေ (၂၀၂၀)
- မော်တော်ယာဉ်ဥပဒေ (၂၀၁၅)
- တိုင်းရင်းသားလူမျိုးများ၏ အခွင့်အရေး ကာကွယ်စောင့်ရှောက်သည့် ဥပဒေ (၂၀၁၅)
- တိုင်းရင်းသားလူမျိုးများ၏ အခွင့်အရေး ကာကွယ်စောင့်ရှောက်သည့် နည်းဥပဒေများ (၂၀၁၅)
- ကူးစက်ရောဂါကာကွယ်ထိန်းချုပ်ရေးဥပဒေ (၁၉၉၅) (ပြင်ဆင်သည့် ဥပဒေ ၂၀၁၁)
- ဆေးလိပ်နှင့် ဆေးရွက်ကြီးထွက်ပစ္စည်း သောက်သုံးမှုထိန်းချုပ်ရေးဥပဒေ (၂၀၁၆)
- အလုပ်အကိုင်နှင့် ကျွမ်းကျင်မှုဖွံ့ဖြိုးတိုးတက်ရေးဥပဒေ (၂၀၁၃)
- အလုပ်သမားရေးရာ အငြင်းပွားမှုဖြေရှင်းရေးဥပဒေ (၂၀၁၂)
- ခွင့်နှင့်အလုပ်ပိတ်ရက်များအက်ဥပဒေ၊ ၁၉၅၁ (ပြင်ဆင်သည့် ဥပဒေ ၂၀၁၄)
- ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများ ထိန်းသိမ်းရေး ဥပဒေ ၂၀၀၆ (ပြင်ဆင်သည့် ဥပဒေ ၂၀၁၇)
- မြန်မာနိုင်ငံအင်ဂျင်နီယာကောင်စီဥပဒေ (၂၀၁၃) (ပြင်ဆင်သည့် ဥပဒေ ၂၀၁၉၊ ၂၀၂၂)
- မြန်မာနိုင်ငံ မီးသတ်တပ်ဖွဲ့ ဥပဒေ (၂၀၁၅)
- အလုပ်သမားအဖွဲ့အစည်း ဥပဒေ (၂၀၁၁)
- အနည်းဆုံးအခကြေးငွေ ဥပဒေ (၂၀၁၃)

- အခကြေးငွေ ပေးချေရေးဥပဒေ (၂၀၁၆)
- အလုပ်သမားလျော်ကြေးအက်ဥပဒေ (၁၉၂၄) (ပြင်ဆင်သည့် ဥပဒေ ၁၉၅၁၊ ၁၉၅၅၊ ၁၉၅၊ ၂၀၀၅)
- လူမှုဖူလုံရေးဥပဒေ (၂၀၁၂)
- လုပ်ငန်းခွင်ဘေးအန္တရာယ်ကင်းရှင်းရေးနှင့် ကျန်းမာရေးဆိုင်ရာဥပဒေ (၂၀၁၉)
- ယဉ်ကျေးမှုအမွေအနှစ်ဒေသများ ကာကွယ်ထိန်းသိမ်းရေးဥပဒေ (၂၀၁၉)
- ရေးဟောင်းဝတ္ထုပစ္စည်းများ ကာကွယ်ထိန်းသိမ်းရေးဥပဒေ (၂၀၁၅)
- ရေးဟောင်းအဆောက်အအုံများ ကာကွယ်ထိန်းသိမ်းရေးဥပဒေ (၂၀၁၅)
- သစ်တော ဥပဒေ (၂၀၁၈)
- ဇီဝမျိုးစုံမျိုးကွဲနှင့် သဘာဝထိန်းသိမ်းရေးနယ်မြေများ ကာကွယ်စောင့်ရှောက်ခြင်းဆိုင်ရာ ဥပဒေ (၂၀၁၈)
- ဓာတုပစ္စည်းနှင့် ဆက်စပ်ပစ္စည်းများ အန္တရာယ်မှ တားဆီးကာကွယ်ရေးဥပဒေ (၂၀၁၃)
- လျှပ်စစ်ဥပဒေ (၂၀၁၄)
- ပို့ကုန်၊ သွင်းကုန် ဥပဒေ (၂၀၁၇)
- မြေအောက်ရေ အက်ဥပဒေ (၁၉၃၀)
- ပြည်သူ့ကျန်းမာရေးဥပဒေ (၁၉၇၂)

စီမံကိန်းအဆိုပြုသူအနေဖြင့် အထက်ပါ တည်ဆဲဥပဒေ၊ နည်းဥပဒေများအပြင် အောက်ဖော်ပြပါ ပြည်တွင်း ပြည်ပ လမ်းညွှန်ချက်၊ စံချိန်စံညွှန်းများကိုလည်း လိုက်နာ ဆောင်ရွက်သွားမည် ဖြစ်ပါသည်-

- အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များ (၂၀၁၅)
- မြန်မာနိုင်ငံအဆောက်အအုံဆိုင်ရာစည်းမျဉ်းများ (၂၀၂၀)
- မြန်မာနိုင်ငံမီးဘေးလုံခြုံရေးဆိုင်ရာလုပ်ထုံးလုပ်နည်းများ (၂၀၂၀)
- ကမ္ဘာ့ကျန်းမာရေးအဖွဲ့ (WHO) ၏ သောက်သုံးရေဆိုင်ရာ စံသတ်မှတ်ချက်
- Environmental, Health, and Safety Guidelines for Tourism and Hospitality Development by International Finance Corporation (IFC)
- International Finance Corporation's (IFC's) Performance Standards
- International Labour Organization (ILO) Guidelines on decent work and socially responsible tourism (2017)

စီမံကိန်းအဆိုပြုသူအနေဖြင့် စီမံကိန်းအား သက်ဆိုင်ရာဥပဒေ၊ နည်းဥပဒေများနှင့် အညီလိုက်နာ၍ အကောင်အထည်ဖော်ဆောင်ရွက်နိုင်ရန်အတွက် အောက်ဖော်ပြပါ

အစိုးရဌာနများ၏ လမ်းညွှန်ချက်များနှင့် စစ်ဆေးမှုများကို လက်ခံလိုက်နာဆောင်ရွက်သွားမည်ဖြစ်ပါသည်-

1. မန္တလေးတိုင်းဒေသကြီး အစိုးရအဖွဲ့
2. မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှုကော်မရှင်
3. ရင်းနှီးမြှုပ်နှံမှုနှင့်ကုမ္ပဏီများညွှန်ကြားမှုဦးစီးဌာန (DICA)
4. ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန(ECD)
5. ရေးဟောင်းသုတေသနနှင့် အမျိုးသားပြတိုက်ဦးစီးဌာန
6. အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန
7. မန္တလေးမြို့တော်စည်ပင်သာယာရေးကော်မတီ (MCDC)
8. ဟိုတယ်နှင့် ခရီးသွားညွှန်ကြားမှုဦးစီးဌာန
9. အလုပ်သမားဝန်ကြီးဌာန
10. ပြည်တွင်းအခွန်ဦးစီးဌာန
11. ပြည်သူ့ကျန်းမာရေးဦးစီးဌာန
12. မန္တလေးလျှပ်စစ်ဓာတ်အားပေးရေးကော်ပိုရေးရှင်း (MESC)

၃။ စီမံကိန်းအကြောင်းအရာဖော်ပြချက်

အဆိုပြုစီမံကိန်းဖြစ်သည့် “တောင်သမန်အပန်းဖြေစခန်း” စီမံကိန်းသည် မြန်မာ့ကျေးလက်အငွေ့အသက်များကို အသုံးပြုတင်ဆက်ကာ မြန်မာ့ခရီးသွားလုပ်ငန်းကို တစ်ဖက်တစ်လမ်းမှ တိုးတက်အထောက်အကူပြုဖြစ်စေမည်ဖြစ်ပါသည်။ ဤစီမံကိန်းကို တောင်သမန်သစ္စာကုမ္ပဏီလီမိတက်မှ အကောင်အထည်ဖော်ဆောင်ရွက်သွားမည်ဖြစ်ပါ သည်။

၃.၁၊ စီမံကိန်းတည်နေရာနှင့် အရွယ်အစား

တောင်သမန်အပန်းဖြေစခန်းစီမံကိန်းသည် တောင်သမန်အင်း၏ အရှေ့တောင်ဖက်၊ ဦးပိန်တံတား၏တောင်ဖက်၊ ဦးပိုင်အမှတ် ၉၉၊ ၁၀၀၊ ၁၀၃/၁၊ ၁၀၃/၂၊ ၁၀၄၊ ၁၀၅၊ ၁၃၄/၁၊ ၁၃၅၊ ၁၃၈/၁၊ ၁၃၈/၂၊ ၁၃၉၊ ၁၅၀/၂၊ ၁၅၁/၁၊ ၁၅၁/၂၊ ၁၅၃/၁၊ တောင်သမန်အကွက်အမှတ် ၅၉၂၊ တောင်သမန်ကျေးရွာအုပ်စု၊ အမရပူရမြို့နယ်၊ မန္တလေးခရိုင်၊ မန္တလေးတိုင်းဒေသကြီးတွင် တည်ရှိပါသည်။

စီမံကိန်းသည် မြေဧရိယာ ၄၀.၂၇ ကေကျယ်ဝန်းပြီး၊ စုစုပေါင်း အဆောက်အဦ ဧရိယာကို ၁၁၉,၀၀၀ စတုရန်းမီတာတည်ဆောက်ရန် လျာထားပါသည်။ တောင်သမန်အင်း ဝန်းကျင်သည် မြို့ပြဖွံ့ဖြိုးတိုးတက်မှုများ ဆောင်ရွက်ပြီးစီးထားသည့် နေရာဖြစ်ပါသည်။

၃.၂၊ စီမံကိန်းသက်တမ်းနှင့် ဘတ်ဂျက်

မြန်မာ့ရင်းနှီးမြှုပ်နှံမှုကော်မရှင်သို့တင်ပြချက်အရ စီမံကိန်းသက်တမ်းသည် ၁၅၊ ၀၅၊ ၂၀၁၄ ခုနှစ် မှ ၂၆၊ ၀၃၊ ၂၀၆၄ ခုနှစ်အထိ စုစုပေါင်း နှစ်ပေါင်း ၅၀ ရှိမည်ဖြစ်ပါသည်။ စီမံကိန်း၏ ကနဦးရင်းနှီးမြှုပ်နှံမှုပမာဏသည် ၃၂,၃၈၂,၂၄၅,၀၅၂ ကျပ် ရှိမည်ဖြစ်ပါသည်။

၃.၃၊ စီမံကိန်းအစိတ်အပိုင်းများ

စီမံကိန်းအစိတ်အပိုင်းများကို အောက်ပါ ဇယားတွင် ဖော်ပြထားပါသည်။ ထို့အပြင် အဆိုပါ စီမံကိန်းအစိတ်အပိုင်းများ၏ အကျယ်အဝန်းများကိုလည်း ဇယားဖြင့် ဖော်ပြထားပါ သည်။

စဉ်	အစိတ်အပိုင်း	အရေအတွက် (ခု)
1.	Shop House (Grade – A)	၁၈
2.	Shop House (Grade – B)	၁၆
3.	Shop House (Grade – C)	၂၀
4.	Shop House (Grade – D)	၂၂
5.	Court Yard	၁၅
6.	ဘဏ်	၁
7.	ဈေးဝယ်စင်တာ	၆
8.	ခရီးသွားလုပ်ငန်းဆောင်စစ်စင်တာ	၁
9.	ခန်းမ	၁
10.	အရောင်းစင်တာ	၁
11.	ရေသန့်စင်ရေးစနစ်	၁
12.	ရေဆိုးသန့်စင်ရေးစနစ်	၁
13.	ရေကူးကန်	၁
14.	မီးစက်ခန်း	၁
15.	ထရန်စဖော်မာခန်း	၁
16.	Tower	၁
စုစုပေါင်း		၁၀၇

စီမံကိန်းအစိတ်အပိုင်း စုစုပေါင်း ၁၀၇ ခု တည်ဆောက်သွားမည်ဖြစ်သည်။ shop houses များသည် နှစ်ထပ်အဆောက်အဦများဖြစ်ကြပြီး မြန်မာ့ရိုးရာလက်မှုထုတ်ကုန် များကို အဓိကထား ရောင်းချသွားမည်ဖြစ်ပါသည်။ ထို့အပြင် ခရီးသွားများအတွက် ဝန်ဆောင်မှု ပေးနိုင်သည့် အခန်း ၉၆ ခန်းပါ ခရီးသွားလုပ်ငန်းဝန်ဆောင်မှုစင်တာကိုလည်း ထည့်သွင်း တည်ဆောက်သွားမည်ဖြစ်ပါသည်။

စဉ်	**အစိတ်အပိုင်း**		**ယူနစ်**	**ဧရိယာ**
1	Lot area		စတုရန်း မီတာ	200,319.57
2	Building footprint area		စတုရန်း မီတာ	50,706.35
3	Total floor area		စတုရန်း မီတာ	11,9476.78
	of which	Shop House (Grade – A)	စတုရန်း မီတာ	19,433.70
		Shop House (Grade – B)	စတုရန်း မီတာ	19,989.90
		Shop House (Grade – C)	စတုရန်း မီတာ	27,209.51
		Lakefront Shophouse Type D	စတုရန်း မီတာ	11,360.40
		Private Club Type E	စတုရန်း မီတာ	1,058.00
		Banquet hall	စတုရန်း မီတာ	9,270.00
		Conference center	စတုရန်း မီတာ	3,974.86
		Hotel	စတုရန်း မီတာ	4,870.01
		Shopping center	စတုရန်း မီတာ	14,776.98
		Supermarket	စတုရန်း မီတာ	4,249.29
		Sales office	စတုရန်း မီတာ	2,229.13
		Transformer room	စတုရန်း မီတာ	500.00
		Generator set room	စတုရန်း မီတာ	350.00
		Tower	စတုရန်း မီတာ	205.00
4	FAR		-	0.60
5	Greening rate		-	35.2%

6	Building density	-	25.3%
7	Household count	Unit	220
8	Residents headcount	Head	704
9	Parking spaces	Space	1,120

၃.၄၊ အဆောက်အဦဒီဇိုင်း

၃.၄.၁၊ အခြေခံဒီဇိုင်း

- လေတိုက်နှုန်းခံနိုင်ရည် - အဆောက်အဦများကို ပြင်းထန်သည့်လေတိုက်နှုန်းများ ခံနိုင်ရည်ရှိစေရန် ဒီဇိုင်းပြုလုပ်ထားပါသည်။ reference wind pressure မှာ တစ်စတုရန်းမီတာလျှင် ၀.၃ ကီလိုနယူတန်ဖြစ်ပါသည်။
- ဆီးနှင်းဝန်အား - အဆောက်အဦများသည် ဆီးနှင်းကျဆင်းသည့်ဒဏ်ကို ခံစားရနိုင် ခြေမရှိသည့်အတွက် ဆီးနှင်းဝန်အားကို ထည့်သွင်းတွက်ချက်ထားခြင်း မရှိပါ။
- မြေငလျင် - အဆောက်အဦဒီဇိုင်းများတွင် မြေငလျင်အခြေအနေများကို ထည့်သွင်းစဉ်းစားထားပါသည်။ မြေငလျင်များအတွက် reference magnitude မှာ VIII နှင့် basic acceleration of ground motion အတွက် ဒီဇိုင်းမှာ ၀.၂g ဖြစ်ပါသည်။ အဆောက်အဦများတည်ရှိရာနေရာသည် ငလျင်ဇုန် ၃ သတ်မှတ်ချက်တွင် အကျုံးဝင်ပါသည်။
- ဘူမိနည်းပညာအခြေအနေ - စီမံကိန်းတည်နေရာရှိ မြေသားများ၊ ဘူမိအခြေအနေ များကို သီးခြားဘူမိနည်းပညာအစီရင်ခံစာ ဆောင်ရွက်ထားရှိပါသည်။

၃.၅၊ မီးဘေးကာကွယ်ရေးဒီဇိုင်း

၃.၅.၁၊ ဗိသုကာအခြေခံ

ဤစီမံကိန်း၏ အဆောက်အဦများကို category-2 buildings များအဖြစ်သတ်မှတ် နိုင်ပါသည်။ လူနေအဆောက်အဦများကို grade-2 fire resistance ဖြင့် ဒီဇိုင်းပြုလုပ်ထား ပါသည်။ မီးသတ်လမ်းများသည် အနည်းဆုံး ၄ မီတာကျယ်ဝန်းပြီး တန် ၃၀ ခံနိုင်ဝန်ရှိပါ သည်။

၃.၅.၂၊ ရေအခြေခံ

စီမံကိန်းဝန်း မီးသတ်ပိုက်ခေါင်းများ

သီးခြားခွဲ၍ သုံးစွဲမည့်အစား ဤစနစ်တွင် မီးသတ်ရေနှင့် သာမန်ရေကို ကွန်ယက်တစ်ခုအတွင်းတွင် အသုံးပြုပါသည်။ အနီရောင်ဆေးသုတ်ထားသည့် မီးသတ်ပိုက် ခေါင်းများကို မီတာ ၁၂၀ အကွာအဝေးအတွင်းတွင် ထားရှိမည်ဖြစ်ပြီး နေရာအနေအထား အရ အချို့အစိတ် အပိုင်းများတွင် ၁၅၀ မီတာခန့်ကွာဝေးမည်ဖြစ်သည်။ မီးသတ်ပိုက်ခေါင်း တစ်ခုစီသည် တစ်စက္ကန့်လျှင် လီတာ ၄၀ ခန့် ထွက်ရှိနိုင်ပြီး မီးသတ်သမားများအနေဖြင့် နှစ်နာရီကြာ အသုံးပြုနိုင်ရန် စီစဉ်ထားရှိမည်ဖြစ်သည်။ မီးသတ်ရေလုံလောက်စွာရရှိနိုင် စေရန် ဤစနစ်သည် တစ်နာရီလျှင် ရေပမာဏ ၂၈၈ ကုဗမီတာ အသုံးပြုနိုင်ပါသည်။

မီးသတ်ရေအတွက် လုံလောက်သော ရေဖိအားရရှိစေရန် Pumps နှစ်လုံး အသုံးပြု သွားမည် ဖြစ်သည်။ Pump တစ်လုံးကို အသုံးပြုမည်ဖြစ်ပြီး အခြားတစ်ခုမှာ အရန်သင့်အနေအထား စီစဉ်ထား ရှိပါမည်။

အဆောက်အဦတွင်း မီးသတ်ပိုက်ခေါင်းများ

အဆောက်အဦအတွင်းရှိ မီးသတ်ပိုက်ခေါင်းများသည် တစ်စက္ကန့်လျှင် လီတာ ၂၀ ထွက်ရှိပါမည်။ မီးသတ်သမားများအနေဖြင့် နှစ်နာရီကြာအသုံးပြုနိုင်ရန် စီစဉ်ထားရှိမည်ဖြစ် သည်။ ဤစနစ်တွင် တစ်နာရီလျှင် ရေပမာဏ ၁၄၄ ကုဗမီတာ အသုံးပြုနိုင်ပါမည်။ မီးသတ်ရေအတွက် လုံလောက်သော ရေဖိအားရရှိစေရန် Pumps နှစ်လုံး အသုံးပြုသွားမည်ဖြစ်သည်။ Pump တစ်လုံးကို အသုံးပြုမည်ဖြစ်ပြီး အခြားတစ်ခုမှာ အရန်သင့်အနေအထားစီစဉ်ထားရှိပါမည်။ မီးသတ်ပိုက်ခေါင်း များကို မြင်သာစေရန် စနစ်တကျ တပ်ဆင်ထားရှိသွားပါမည်။ ရေပေးဝေမှုစနစ် တည်ငြိမ်မှုရှိစေရန် လက်စွပ်ပုံစံ ပိုက်လိုင်းများတပ်ဆင်ထားရှိပါသည်။ အလိုအလျောက်ရေဖြန်းစနစ်နှင့် မီးသတ်ပိုက် ခေါင်း များကို ၁၈ ကုဗမီတာရှိ အမိုးပေါ်ရေကန်နှင့် ဆက်သွယ်ထားပါမည်။ အဝေးဆုံး မီးသတ်ပိုက် ခေါင်း၌ပင် အနည်းဆုံး ရေဖိအား ၁၀ မီတာရှိစေရန် ရေကန်ကို စနစ်တကျ နေရာချထားပါမည်။

အလိုလျောက်ရေဖြန်းစနစ်

ခန်းမနှင့် စျေးဝယ်စင်တာတို့တွင် အလိုလျောက်ရေဖြန်းစနစ်ကို အသုံးပြုသွားပါ မည်။ ပိုက်လိုင်းများတွင် အမြဲတစေ ရေအပြည့်ရှိနေစေမည်ဖြစ်ပါသည်။ ဤစနစ်ကို အလယ်အလတ် အဆင့်ရှိမီးဘေး (grade II) အတွက် ရည်ရွယ်၍ ဒီဇိုင်းဆောင်ရွက်ထားပါ သည်။ အလိုလျောက် ရေဖြန်းစနစ်မှ ရေပိုက်ခေါင်းတစ်ခုစီသည် ၁၆၀ မီတာခန့် ရေဖြန်းနိုင် ပါမည်။ အလိုလျောက်ရေဖြန်း စနစ်သည် အလိုလျောက်တစ်နာရီခန့် အလုပ်လုပ်နိုင်ပါသည်။

၃.၆၊ စွမ်းအင်ထိရောက်စွာအသုံးပြုမှု

အဆောက်အဦဒီဇိုင်းများတွင် စွမ်းအင်ကို ထိရောက်စွာအသုံးပြုနိုင်စေရန် စီစဉ်ထား ရှိမည်ဖြစ်သည်-

ဗိသုကာ - အဆောက်အဦများကို လေတိုက်ရာအရပ်များအတိုင်း နေရာချထား စီစဉ်ထား ပါပြီး ရိုးရှင်းသောပုံစံများ အသုံးပြုထားပါသည်။ ထို့အပြင် သဘာဝ အလင်းရောင် နှင့် လေဝင်လေထွက်ကောင်းမွန်ရန် ထည့်သွင်းစဉ်းစားကာ အပူ ဆုံးရှုံးမှုကိုလည်း အနည်းဆုံး ဖြစ်စေရန် အဆောက်အဦများတွင် မှန်တပ်ဆင်ခြင်းကို အနည်းဆုံးလျှော့ချထား ပါသည်။

HVAC - အဆောက်အဦ၏ အပူနှင့် အအေးပေးစနစ်များကို အဆောက်အဦ အကာအရံ များနှင့် လိုက်လျောညီထွေအလုပ်ဖြစ်စေရန် ဒီဇိုင်းပြုလုပ်ထားပါသည်။ ထိုသို့စီစဉ်ထားရှိခြင်း ဖြင့် စွမ်းအင်ပြန်းတီးမှုလျှော့ချနိုင်ခြင်း၊ ဆူညံသံ လျှော့ချနိုင် ခြင်း၊ နှင့် စွမ်းအင်ကို ထိရောက် စွာ အသုံးပြုနိုင်မည်ဖြစ်သည်။

ရေ - ရေချွေတာသည့် သန့်စင်ခန်းများ၊ ရေပန်းများအတွက် ရေကို ပြန်လည် အသုံးပြု ခြင်းအပါအဝင် ရေချွေတာသည့် နည်းလမ်းများ၊ ကိရိယာများကို စီမံကိန်း ကာလတလျှောက် အသုံးပြုသွားမည်ဖြစ်သည်။ စွန့်ပစ်ရေဆိုးများကို စွန့်ပစ်ခြင်း မပြုမီ သန့်စင်သွားမည်ဖြစ် သည်။

လျှပ်စစ် - ဓာတ်အားခွဲရုံနှင့် ထရန်စဖော်များကို စနစ်တကျ နေရာချထားပြီး စွမ်းအင်ဆုံးရှုံးမှု နည်းစေမည့် ပစ္စည်းများ အသုံးပြုသွားမည်ဖြစ်သည်။ စွမ်းအင် အသုံးပြုမှုကိုလည်း အလို လျောက်ချိန်ညှိခြင်းများနှင့် စွမ်းအင်ချွေတာသည့်မီးများ တပ်ဆင်အသုံးပြု၍ ထိရောက် စေရန် ဆောင်ရွက်ပါမည်။

၃.၇၊ လျှပ်စစ်ဒီဇိုင်း

အဆောက်အဦများကို သီးခြားစီ လျှပ်စစ်စွမ်းအင် ရယူနိုင်ရန် ဆက်သွယ်ထားရှိပါ မည်။ လျှပ်စစ်စွမ်းအင်ကို နိုင်ငံတော်မဟာဓာတ်အားလိုင်းမှ အဓိကရယူသွားမည်ဖြစ်ပြီး၊ အရန်အနေဖြင့် မီးစက်များလည်း ထားရှိပါမည်။ အဆောက်အဦတစ်ခုချင်းစီအတွက် သီးခြား ထရန်စဖော်မာများနှင့် အရေးပါမှုအလျောက် ကွဲပြားသည့် လျှပ်စစ်ကိရိယာများ တပ်ဆင်သွားပါမည်။ ဖုန်းလိုင်းများ၊ အင်တာနက်လိုင်းများ၊ တီဗီလိုင်းများကိုလည်း အဆောက်အဦးတစ်ခုချင်းစီအလိုက် တပ်ဆင်သွား မည်ဖြစ်သည်။ မိုးကြိုးလွှဲရန်အတွက် အဆောက်အဦအုတ်မြစ်သို့မြှုပ်ထားသည့်စနစ်ကို အသုံးပြုထား သည်။

၃.၈၊ ရေပေးဝေမှု

မြေအောက်ရေ အသုံးပြုသွားမည်ဖြစ်ပြီး ဂါလံ ၃၀၀,၀၀၀ ဆန့်ကန်တွင် သိုလှောင် ထားရှိပါမည်။ အဆောက်အဦတစ်ခုချင်းစီတွင် (ဂါလံ ၁,၆၀၀ မှ ၄,၀၀၀ ဆန့်) ရေသိုလှောင်ကန်များနှင့် အလိုလျောက်ရေဖိအားပန့်များတပ်ဆင်ထားပါသည်။ ရေအရည်

အသွေးသည် သောက်သုံးရန်အတွက် စံချိန်စံညွှန်းပြည့်မီပါသည်။ ရေလိုအပ်ချက်မှာ တစ်နေ့လျှင် ၈၀၀ ကုဗမီတာဖြစ်ပါသည်။

ရေနုတ်မြောင်းစနစ်သည် တွက်ချက်မှုများအရ နှေ့စဉ်အများဆုံး ၃၃၅ ကုဗမီတာ ထွက်ရှိမည် ဖြစ်သည်။ မိလ္လာရေနှင့် မီးဖိုချောင်စွန့်ပစ်ရေများကို သီးခြားစီးဆင်းစေမည်။ မိလ္လာရေများကို စွန့်ပစ်ခြင်းမပြုမီ septic tank ဖြင့်သန့်စင်သွားပါမည်။ အအေးပေးစနစ်မှ ထွက်ရှိလာသည့် ရေများကိုလည်း သီးခြားစီးဆင်းထုတ်လွှတ်ပါမည်။

ရေကူးကန်

အပန်းဖြေစခန်းစီမံကိန်းတွင် ၂၀ x ၁၅ မီတာရှိ ကွန်ကရစ်ဖြင့် ပြုလုပ်ထားသော ရေကူးကန်လည်း ပါဝင်မည်ဖြစ်သည်။ ရေကူးကန် ရေသန့်စင်စေရန်အတွက် balancing tank ပါဝင်သော filtration စနစ်ဖြင့် ဆောင်ရွက်ပါမည်။ အဆိုပါစနစ်တွင် ရေ ၆၀၀ ကုဗမီတာခန့်ကို အမြဲတစေသန့်ရှင်းနေစေရန် circulating pumps၊ D.E. filters များနှင့် salt chlorination system တို့ဖြင့် ဆောင်ရွက်သွားပါမည်။

၃.၉၊ စီမံကိန်းလုပ်ငန်းများ

စီမံကိန်းလုပ်ငန်းအစအဆုံးတွင် အဆင့် ၄ ဆင့်ပါဝင်မည်ဖြစ်သည်။ တောင်သမန် သစ္စာ ကုမ္ပဏီလီမိတက်မှ စီမံကိန်းတည်ဆောက်ရာတွင် အပြည့်အဝတာဝန်ယူမည်ဖြစ်ပြီး တည်ဆောက် ရေးလုပ်ငန်းများကို မြန်မာနိုင်ငံအဆောက်အဦစံသတ်မှတ်ချက်များနှင့် အညီ ဆောင်ရွက်သွား ပါမည်။

တည်ဆောက်ရေးအကြိုကာလ

တည်ဆောက်ရေးအကြိုကာလ လုပ်ငန်းများမှာ အောက်ပါအတိုင်းဖြစ်သည်

- စီမံကိန်းအစီအစဉ်ချထားမှု
- ဒီဇိုင်းထုတ်ခြင်းနှင့် ခွင့်ပြုမိန့်များ ရယူခြင်း
- ကန်ထရိုက်ရွေးချယ်ခြင်း
- စီမံကိန်းအချိန်ဇယားရေးဆွဲခြင်း
- ကုန်ကြမ်းပစ္စည်းများ ရွေးချယ်ဝယ်ယူနိုင်ရန် စီစဉ်ခြင်း
- ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်ရေးဆွဲခြင်း

တည်ဆောက်ရေးကာလ

တည်ဆောက်ရေးကာလသည် ၁၁ နှစ်ကြာမြင့်မည်ဖြစ်ပါသည်။ တည်ဆောက်ရေး လုပ်ငန်းများကို ၂၀၁၄ ခုနှစ် ဇွန်လတွင် စတင်ပြီး ၂၀၂၅ ခုနှစ်တွင် ပြီးစီးနိုင်ရန် မျှော်မှန်းထား ပါသည်။ အဆိုပါကာလအတွင်း အဆောက်အဦတည်ဆောက်ရေးလုပ်ငန်းများ ဆောင်ရွက် သွားမည်ဖြစ်ပါသည်။

၃.၁၀၊ စက်ယန္တရားများ

အဆောက်အဦများ အားလုံး အောင်မြင်စွာတည်ဆောက်နိုင်ရန်အတွက် စက်ယန္တရား အများ အပြားလိုအပ်မည်ဖြစ်သည်။ အောက်ဖော်ပြပါ ယန္တရားစာရင်းသည် စီမံကိန်း တည်ဆောက်ရေး ကာလအတွင်းတွင် အသုံးပြုသွားမည့် စာရင်းဖြစ်ပါသည်-

Taung Tha Man Thit Sar Company Limited
List of Machineries, Equipment and Others to be purchased in local

Exhibit-2-3

Sr No.	ITEM NAME	Unit	Qty	Unit Price	Amount
	Machineries				
1	But Welder	Unit	8	2,440,800.00	19,038,240.00
2	Bending Machine	Unit	8	788,400.00	6,149,520.00
3	Steel Bar Straightening Machine	Unit	8	2,440,800.00	19,038,240.00
4	Steel Bar Cutting Machine	Unit	8	3,098,400.00	24,167,520.00
5	Steel Bar Set of Silk Machine	Unit	4	2,816,400.00	11,828,880.00
6	Welding Machine	Unit	40	243,600.00	9,792,720.00
7	Air Compressor	Unit	20	1,126,800.00	22,310,640.00
8	Intercon	Unit	160	66,000.00	10,573,200.00
9	Tower Crane (C 5510)	Unit	8	157,946,000.00	1,232,018,800.00
10	Tower Crane (C 5510)	Unit	4	157,946,000.00	663,333,200.00
11	Construction Elevator	Unit	12	30,076,800.00	360,921,600.00
12	Pump Pipe	Unit	4004	19,200.00	76,884,480.00
13	Slump Pipe Accessories	Unit	1201	2,400.00	2,882,880.00
14	Pumping Station (HTB 60)	Unit	8	5,634,000.00	43,945,200.00
15	Material Spreader (HGY 18)	Unit	10	2,253,600.00	22,986,720.00
16	Planer	Unit	12	1,878,000.00	22,536,000.00
17	Commercial Elevator	Unit	56	60,093,600.00	3,353,222,880.00
18	Service Truck	Unit	6	17,433,350.00	104,600,100.00
19	Service Car (Lexus LX 570)	Unit	4	119,262,400.00	429,624,640.00
20	Business Purpose Vehicle (Toyota Camry XLE Hybrid)	Unit	4	40,265,600.00	145,024,160.00
	Total				6,580,879,620.00

၃.၁၁၊ အလုပ်အကိုင်ခန့်ထားမှု

စီမံကိန်း တည်ဆောက်ရေးနှင့် လည်ပတ်ရေးကာလများတွင် အလုပ်အကိုင် အခွင့် အလမ်းများစွာ ပေါ်ပေါက်နိုင်မည်ဖြစ်သည်။ စီမံကိန်းအတွက် ဝန်ထမ်းများကို ဒေသခံများမှ ဦးစားပေးခန့်အပ်သွားမည်ဖြစ်ပြီး တည်ဆောက်ရေးကာလအတွင်း လုပ်သားလိုအပ်ချက်မှာ တစ်ရက်လျှင် အများဆုံး ၁၀၀ - ၁၂၀ ဦးခန့် လိုအပ်ပါမည်။ အလုပ်ချိန်မှာ တစ်ရက်လျှင် ၈ နာရီဖြစ်ပါသည်။ အလုပ်သမားအများစုမှ အလုပ်ချိန်ပြီးစီးပါက ၎င်းတို့အိမ်များသို့ ပြန်ကြမည်ဖြစ်ပြီး စီမံကိန်းတွင် နေထိုင်ရန်အတွက် စီစဉ်ထားရှိရန် မလိုအပ်ပေ။ သို့သော် အလုပ်ချိန်အတွင်း

အနားယူနိုင်ရန် ယာယီနေရာများကို စီစဉ်ထားရှိပေးပါမည်။ လုပ်ငန်းလည်ပတ်ရေးကာလတွင် စီမံကိန်းအတွက် ဝန်ထမ်းလိုအပ်ချက်မှာ အမြဲတမ်း ဝန်ထမ်း ၇၅ ဦးခန့် လိုအပ်မည်ဖြစ်ပါသည်။

၃.၁၂၊ လောင်စာဆီ

တည်ဆောက်ရေးကာလ ယန္တရားများ မောင်းနှင်ရန် လောင်စာဆီအဖြစ် ဒီဇယ်ကို အသုံးပြု သွားမည်ဖြစ်ပါသည်။ လိုအပ်ချက်မှာ တစ်ရက်လျှင် ၁၅ ဂါလန်ခန့်ဖြစ်ပါသည်။ လိုအပ်သော လောင်စာဆီကို စီမံကိန်းနှင့်အနီးဆုံး လောင်စာဆီရောင်းချသည့် နေရာမှ ဝယ်ယူ အသုံးပြု သွားပါမည်၊ စီမံကိန်းအတွင်း လောင်စာဆီသိုလှောင်အသုံးပြုမည့် အစီအစဉ်မရှိပါ။ စီမံကိန်း လည် ပတ်ရေးကာလအတွင်းတွင်မူ မီးစက်များ မောင်းနှင်ရန် လောင်စာဆီ လိုအပ်မည် ဖြစ်ပါသည်။

၃.၁၃၊ အမှိုက်စီမံခန့်ခွဲမှု

စီမံကိန်း တည်ဆောက်ရေးနှင့် လည်ပတ်ရေးကာလအတွင်း အမှိုက်များ ထွက်ရှိမည် ဖြစ်ပါသည်။ တည်ဆောက်ရေးကာလအတွင်း ကွန်ကရစ်၊ သစ်သား၊ စတီးလ်နှင့် ပလတ်စတစ်အမှိုက်များ ထွက်ရှိနိုင်ပါသည်။

လည်ပတ်ရေးကာလအတွင်းတွင် စားသောက်ဆိုင်၊ ဟိုတယ်တို့မှ အော်ဂဲနစ် အမှိုက်များ၊ စက္ကူ၊ ပလတ်စတစ်၊ ဖန်ကွဲစ၊ သတ္တုပစ္စည်းနှင့် လျှပ်စစ်စွန့်ပစ်ပစ္စည်းများ ထွက်ရှိနိုင်ပါသည်။ ယေဘုယျအားဖြင့် လူတစ်ဦးလျှင် စွန့်ပစ်အမှိုက် ၁ ကီလိုဂရမ်ထွက်ရှိ နိုင်ကြောင်း ခန့်မှန်းရပါသည်။

မန္တလေးစည်ပင်သာယာရေးကော်မတီနှင့် ချိတ်ဆက်စွန့်ပစ်ခြင်းမပြုမီ စီမံကိန်းမှ ထွက်ရှိသည့်အမှိုက်များကို စီမံကိန်းအတွင်းတွင် ယာယီသိမ်းဆည်းထားပါမည်။ တာဝန်သိ စွန့်ပစ်အမှိုက်စီမံခန့်ခွဲမှုဆောင်ရွက်နိုင်ရန် အမှိုက်ခွဲခြားစွန့်ပစ်စေမည်ဖြစ်ပြီး မည်သို့ ခွဲခြား စွန့်ပစ်ရမည်ကို အမှိုက်ပုံးများတွင် ဖော်ပြထားမည်ဖြစ်ပါသည်။

၃.၁၄၊ စွန့်ပစ်ရေဆိုး

စီမံကိန်း တည်ဆောက်ရေးနှင့် လည်ပတ်ရေးကာလအတွင်း စွန့်ပစ်ရေဆိုးများ ထွက်ရှိမည် ဖြစ်ပါသည်။

တည်ဆောက်ရေးကာလ - ကွန်ကရစ်ဖျော်စပ်ခြင်း၊ ပစ္စည်းကိရိယာများ ဆေးကြော သန့်စင်ခြင်း၊ စီမံကိန်းမှ ရေစုပ်ထုတ်ခြင်း၊ ဖုန်မှုန့်မထစေရန် ရေဖြန်းခြင်း စသည့် ရေအသုံးပြုဆောင်ရွက်သောလုပ်ငန်းများမှ စွန့်ပစ် ရေဆိုးထွက်ရှိနိုင်ပါသည်။ အဆိုပါ လုပ်ငန်းစီးဆင်းရေများကို ယာယီအနည်ထိုင်ကန်များဖြင့် ဖြတ်သန်း စီးဆင်းစေပြီးမှ ထုတ်လွှတ်ပါမည်။

လည်ပတ်ရေးကာလ - လုပ်ငန်းလည်ပတ်ရေးကာလတွင် စီမံကိန်းအတွင်း နေထိုင်သူများထံမှ တရက်လျှင် ရေဆိုး ၈၀ - ၁၀၀ ဂါလန်ထွက်ရှိနိုင်ပါသည်။ အဆိုပါ ရေဆိုးများကို ရေဆိုးသန့်စင်စနစ်အသုံးပြု၍ သန့်စင်ပါမည်။

၃.၁၄.၁ စွန့်ပစ်ရေဆိုးသန့်စင်ရေးစနစ်

စီမံကိန်းတွင် Johkasou စနစ်ကို အသုံးပြု၍ စွန့်ပစ်ရေဆိုးများကို သန့်စင်သွားမည် ဖြစ်ပါသည်။ လုပ်ငန်းများစတင်လည်ပတ်ချိန်တွင် septic tank များကိုလည်း ထည့်သွင်း အသုံးပြုသွားမည်ဖြစ်ပါသည်။

၄။ အနီးပတ်ဝန်းကျင်ဆိုင်ရာ အကြောင်းအရာဖော်ပြချက်

၄.၁၊ ဇီဝမျိုးစုံမျိုးကွဲ

ဇီဝမျိုးစုံမျိုးကွဲများ သို့မဟုတ် သက်ရှိများနှင့် ၎င်းတို့၏ လုပ်ငန်းစဉ်များသည် ကြီးမားသော ဂေဟစနစ်၊ စီးပွားရေးနှင့် အလှအပဆိုင်ရာ အကျိုးကျေးဇူးများကို ပေးဆောင် သည့် သဘာဝ၏အခြေခံပိုင်ဆိုင်မှုတစ်ခုဖြစ်သည်။ ဇီဝမျိုးစုံမျိုးကွဲဆုံးရှုံးမှုသည် ကြီးမားသော ဂေဟစနစ်နှင့် စီးပွားရေးဆိုင်ရာ အကျိုးဆက်များနှင့်အတူ နိုင်ငံအဆင့်နှင့် ကမ္ဘာလုံးဆိုင်ရာ အဆင့် အဓိကစိုးရိမ်ပူပန်မှုတစ်ခုအဖြစ် အသိအမှတ်ပြုထားသည်။

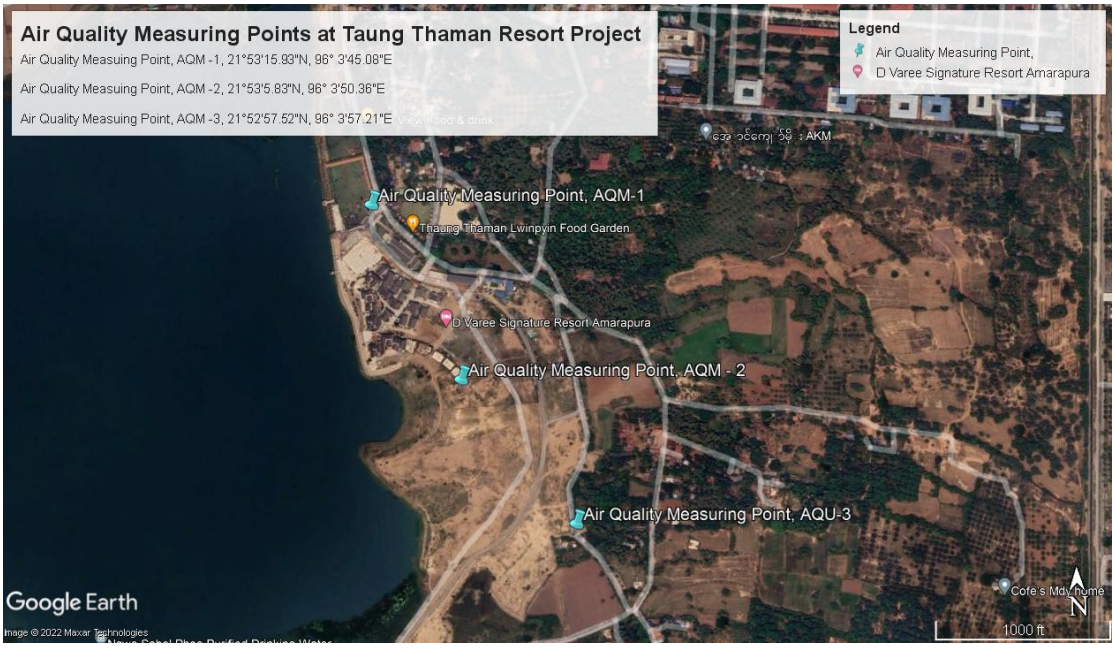
အဆိုပြုစီမံကိန်းနှင့် အနီးဝန်းကျင်နေရာများရှိ သစ်ပင်ပန်းမန်များနှင့် တိရစ္ဆာန်များကို လေ့လာဆန်းစစ်ခဲ့ပါသည်။ တောင်သမန်အင်းသည် ရေဝပ်ဒေသဖြစ်သည်သာမက ကုန်းတွင်း ငါးဖမ်းဧရိယာလည်းဖြစ်သည်။ လေ့လာဆန်းစစ်ခဲ့သည့်ဧရိယာအတွင်း ငှက်မျိုးစိတ် လေးဆယ့်ငါး (၄၅) မျိုး မှတ်တမ်းတင်တွေ့ရှိခဲ့ပြီး အများစုမှ ရေဝပ်ဒေသငှက်မျိုးစိတ်များ ဖြစ်ပါသည်။ သစ်ပင်ပန်းမန်မျိုးကွဲများမှာ ရေဝပ်ဒေသ၊ ကုန်းတွင်းနှင့် စိုက်ပျိုးမြေများတွင် ရှိနေပါသည်။ ရေနေအပင်မျိုးစိတ် ခြောက် (၆) မျိုး၊ ကုန်းတွင်းအပင်မျိုးစိတ် သုံးဆယ့်ခြောက် (၃၆) မျိုးနှင့် သီးပင်စားပင်မျိုးစိတ် ဆယ် (၁၀) မျိုး တွေ့ရှိခဲ့ပါသည်။ ရေညှိပင်ငယ်များ အများအပြား တွေ့ရှိခဲ့သော်လည်း မှတ်တမ်းတင်ခဲ့ခြင်း မရှိပါ။ ငါးမျိုးစိတ် တစ်ဆယ့်လေး (၁၄) မျိုးအပြင် လိပ်ပြာမျိုးစိတ် တစ်ဆယ့်လေး (၁၄) မျိုး၊ ပုစဉ်းမျိုးစိတ် တစ်ဆယ် (၁၀) မျိုးနှင့် ကြွက်နှင့် တွားသွား သတ္တဝါ မျိုးစိတ် ရှစ် (၈) မျိုး တွေ့ရှိမှတ်တမ်းတင်နိုင်ခဲ့ပါသည်။ မှတ်တမ်းတင်တွေ့ရှိခဲ့သော အပင်နှင့် သတ္တဝါမျိုးစိတ်များကို IUCN Red List ဖြင့် နှိုင်းယှဉ် ဆန်းစစ်ခဲ့ရာ မျိုးသုဉ်းလုနီးပါး သို့မဟုတ် ခြိမ်းခြောက်ခံနေရသောမျိုးစိတ်များနှင့် အစုလိုက် မျိုးစိတ်များလည်း မရှိကြောင်း စိစစ်တွေ့ရှိရပါသည်။

၄.၂၊ ရုပ်ပိုင်းဆိုင်ရာပတ်ဝန်းကျင်

၄.၂.၁၊ လေထုအရည်အသွေး

လေထုအရည်အသွေးတိုင်းတာခြင်းလုပ်ငန်းများကို တောင်သမန်သစ္စာအပန်းဖြေ စခန်း အုပ်ချုပ်မှုရုံးခန်း မျက်နှာစာမြေကွက်လပ်၊ တည်ဆောက်ရေးလုပ်ငန်းများအနီးနှင့် စီမံကိန်းဧရိယာ အစွန် တဲနန်းသာကျေးရွာအနီး သုံးနေရာတွင် ရွေးချယ် ဆောင်ရွက်ခဲ့ပါသည်။

တိုင်းတာရေးလုပ်ငန်းများ ဆောင်ရွက်ရာတွင် ဆာလဖာဒိုင်အောက်ဆိုဒ်၊ နိုက်ထရိုဂျင်ဒိုင်အောက်ဆိုက်ဒ်၊ ကာဗွန်မိုနောက်ဆိုက်ဒ်၊ PM2.5၊ PM10၊ လေအရှိန်နှင့် ဦးတည်ရာစသည့် ပါရာမီတာများကို ရွေးချယ် တိုင်းတာခဲ့ပါသည်။ လေအရည်အသွေး တိုင်းတာဆောင်ရွက်ခဲ့သည့် တည်နေရာ အသေးစိတ်ကို အောက်ပါပုံတွင် ဖော်ပြထားပါ သည်။



အထက်ဖော်ပြပါ နေရာများမှ တိုင်းတာရရှိခဲ့သော လေထုအရည်အသွေး ရလဒ် များကို အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များဖြင့် နှိုင်းယှဉ် ဆန်းစစ်ခဲ့ရာ လက်ရှိ လေထုအရည်အသွေးတန်ဖိုးများသည် လမ်းညွှန်ချက်ပါတန်ဖိုးများကို ကျော်လွန်ခြင်း မရှိကြောင်း တွေ့ရှိရပါသည်။ တိုင်းတာမှု အသေးစိတ် ရလဒ်များကို ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း အစီရင်ခံစာတွင် အပြည့်အစုံဖော်ပြထားပါသည်။

၄.၂.၂ ရေအရည်အသွေး

စီမံကိန်းတည်နေရာရှိ မြေပေါ်မြေအောက် လက်ရှိရေအရည်အသွေး အခြေအနေများ သိရှိနိုင်ရန်အတွက် တောင်သမန်အင်းရေနှင့် စီမံကိန်းဧရိယာရှိ မြေအောက်ရေနမူနာများ အပါအဝင် စီမံကိန်းအနီးဝန်းကျင်ရှိ တည်နေရာ ငါးခုမှ ရေနမူနာများ ကောက်ယူ ဆန်းစစ်ခဲ့ပါသည်။ အဆိုပါရေနမူနာများကို စိမ်းလန်းအမိမြေဖွံ့ဖြိုးတိုးတက်ရေးအသင်း (ALARM) ၏ ပတ်ဝန်းကျင်ရေးရာဓာတ်ခွဲခန်းသို့ ပေးပို့၍ ယင်းတို့၏ရူပဓာတုဆိုင်ရာ ဂုဏ်သတ္တိများကို စမ်းသပ်စစ်ဆေးခဲ့ပါသည်။

ရေနမူနာကောက်ယူမည့် နေရာများရွေးချယ်ရာတွင် စီမံကိန်းတည်နေရာ၊ စိုက်ပျိုး မြေများ၊ မြေမျက်နှာလျှောစောက်၊ မြေမျက်နှာသွင်ပြင်အနိမ့်အမြင့်၊ မိလ္လာနှင့် ရေနုတ်မြောင်း စနစ်တည်နေရာနှင့် စွန့်ပစ်မည့်စနစ်များစသည့်အခြေအနေများကို ထည့်သွင်းစဉ်းစား၍ ရွေးချယ်ခဲ့ခြင်း ဖြစ်ပါသည်။

စီမံကိန်းဧရိယာရှိ မြေအောက်ရေနမူနာမှ ရေအရည်အသွေးရလဒ်များကို ကမ္ဘာ့ကျန်းမာရေးအဖွဲ့ (WHO) ၏ သောက်သုံးရေစံသတ်မှတ်ချက်များနှင့် နှိုင်းယှဉ် ဆန်းစစ်ခဲ့ရာ ကလိုရိုက်ဒ်နှင့် ဆာလဖိတ်ဓာတ်များ မြင့်မားနေသည်ကို စိစစ်တွေ့ရှိ ရပါသည်။ မြေအောက်ရေတွင် ဆာလဖိတ်ဓာတ်ပမာဏ မြင့်မားနေရခြင်း ဖြစ်နိုင်ချေ အကြောင်းအရင်းတစ်ခုမှာ ယင်းဧရိယာရှိ

မြေအောက်အလွှာနှင့် ကျောက်လွှာများတွင် ဆာလဖိတ်ဓာတ်များ သဘာဝအလျောက် အများအပြားပါဝင်နေပြီး အချို့မှာ မြေအောက်ရေ အတွင်းသို့ ပျော်ဝင်သွားသောကြောင့် ဖြစ်နိုင်ပါသည်။ အခြားရေနမူနာများမှ ရူပဓာတု ဆိုင်ရာ တန်ဖိုးများမှာမူ စံသတ်မှတ်ချက်ပါ တန်ဖိုးများနှင့်ကိုက်ညီကြောင်း တွေ့ရှိရပါသည်။ တိုင်းတာမှု အသေးစိတ်ရလဒ်များကို ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာတွင် အပြည့်အစုံဖော်ပြထားပါသည်။

၄.၂.၃၊ ဆူညံသံနှင့် တုန်ခါမှု

ဆူညံသံနှင့် တုန်ခါမှုများကို အောက်ပါပုံတွင် ဖော်ပြထားသည့် စီမံကိန်း အနီးဝန်းကျင် တည်နေရာ ၃ ခုတွင် တိုင်းတာလေ့လာခဲ့ပါသည်။ စီမံကိန်းဝန်းကျင်၏ နေ့အချိန်တွင် ယာဉ်များသွားလာခြင်း၊ လူတို့၏ နေ့စဉ်လုပ်ငန်းဆောင်တာများနှင့် တည်ဆောက်ရေး လုပ်ငန်းမှ အသံများဖြင့် ဖုံးလွှမ်းနေသည်ကို တွေ့ရှိခဲ့ရပါသည်။ တိုင်းတာမှု အသေးစိတ် ရလဒ်များကို ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာတွင် အပြည့်အစုံဖော်ပြထားပါ သည်။

၄.၂.၄၊ မြေဆီလွှာအရည်အသွေး

မြေဆီလွှာအရည်အသွေးကို သိရှိနိုင်ရန်အတွက် စီမံကိန်းပရဝုဏ်အတွင်းမှ မြေနမူနာကို ရယူခဲ့ပါသည်။ အဆိုပါ မြေနမူနာကို စိုက်ပျိုးရေးနှင့် ဆည်မြောင်းဝန်ကြီးဌာန၊ မြေအသုံးချမှုဦး စီးဌာနရှိ ဓာတ်ခွဲခန်းသို့ ပေးပို့စစ်ဆေးခဲ့ပြီး စစ်ဆေးချက်ရလဒ်များကို ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်းအစီရင်ခံစာတွင် ဖော်ပြထားပါသည်။

၄.၂.၅၊ မြေမျက်နှာသွင်ပြင်နှင့် ရာသီဥတု

လေ့လာမှုများဆောင်ရွက်ခဲ့သည့် ဧရိယာသည် တောင်သမန်အင်း၏ အရှေ့တောင် ဖက်နှင့် ဦးပိန်တံတား၏ မြောက်ဖက်တွင် တည်ရှိပါသည်။ အဆိုပါဧရိယာအတွင်း ကျေးရွာ များတည်ရှိပြီး မထွန်ယက်မစိုက်ပျိုးသော မြေလွတ်များ ရေကန်များ ပါဝင်ပါသည်။ သို့ဖြစ်ပါ၍ မြေမျက်နှာသွင်ပြင်သည် မြေပြန့်ဖြစ်ပြီး အနိမ့်အမြင့် သိသိသာသာကွာခြားချက် မရှိပါ။ စီမံကိန်းသည် အပူပိုင်း ခြောက်သွေ့ စိုစွတ်သော ရာသီဥတုရှိသည့် ဧရိယာတွင် တည်ရှိပြီး ပျှမ်းမျှအပူချိန်မှာ ၂၁ ဒီဂရီစင်တီဂရိတ်နှင့် ၃၁ ဒီဂရီစင်တီဂရိတ်အကြား ရှိပါသည်။

၄.၃၊ လူမှုစီးပွားရေး

စီမံကိန်းအနီးကျေးရွာများဖြစ်သည့် တောင်သမန်ကျေးရွာ၊ နွားနို့တော်စုကျေးရွာ၊ ရွာသစ်ကျေးရွာနှင့် တဲနန်းသာကျေးရွာများတွင် ကွင်းဆင်းအချက်အလက်များကို စနစ်တကျ ကောက်ယူခဲ့ပြီး ရရှိသည့်အချက်အလက်များအသုံးပြု၍ ဒေသခံလူထု၏ လူမှုစီးပွားဆိုင်ရာ အခြေအနေများကို ဖော်ထုတ်တင်ပြထားပါသည်။ နမူနာအရွယ်အစားကို Cochran ပုံသေနည်းအသုံးပြု၍ တွက်ချက်ထားပါသည်။ အဆိုပါကျေးရွာများတွင် အိမ်ထောင်စု စုစုပေါင်း ၅၁၄ စု ခန့်ရှိပြီး အိမ်ထောင်စု ၂၂ စုကို နမူနာကောက်ယူခဲ့ပါသည်။ အသက်အရွယ် အုပ်စု၊ ကျား/မ အချိုးအစား၊ ပညာရေးနှင့် အလုပ်အကိုင်အခြေအနေများ၏ ဆန်းစစ်တွက်ချက်မှုရလဒ်များကို ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာတွင် ဖော်ပြထားပါသည်။

၄.၃.၁၊ စီမံကိန်းနှင့် သက်ဆိုင်သူများဆန်းစစ်ချက်

စီမံကိန်းနှင့် သက်ဆိုင်သူများကို ဒေသခံပြည်သူများ၊ အစိုးရအဖွဲ့အစည်းများ၊ စီမံကိန်းအဆိုပြုသူနှင့် အခြားစိတ်ပါဝင်စားသည့်အစုအဖွဲ့ ဥပမာ - အစိုးရမဟုတ်သော

အဖွဲ့အစည်းများ (NGOs) ဟု အုပ်စု လေး (၄) ခု ခွဲခြားသတ်မှတ်နိုင်ပါသည်။ ဆန်းစစ်ချက်ကို အခြေခံသက်ရောက်နိုင်သည့်အချက်များဖြစ်သည့် မြေယာကိစ္စရပ်များတွင် ပါဝင်ပတ်သက် မှု၊ စီမံကိန်းအနီးဝန်းကျင်၊ ရေနှင့် အခြေခံအဆောက်အအုံကဲ့သို့သော အရင်းအမြစ်များခွဲဝေ သုံးစွဲရမှုတို့အပေါ် အခြေခံ၍ ဆောင်ရွက်ထားခြင်းဖြစ်ပါသည်။

ဇယား ၈၊ စီမံကိန်းနှင့်သက်ဆိုင်သူများဆန်းစစ်ချက်

စဉ်	သက်ဆိုင်သူ အစုအဖွဲ့	သက်ဆိုင်သူများ	စိတ်ဝင်စားမှုအဆင့်		Interest
			အဆင့်	အကြောင်းပြချက်	
၁	ဒေသခံပြည်သူ	တောင်သမန်ကျေးရွာ	မြင့်မား	နီးကပ်စွာ တည်ရှိခြင်း	- ဒေသဖွံ့ဖြိုး တိုးတက်မှု - လမ်းပျက်စီးမှု - လုံခြုံရေး - လေထုညစ်ညမ်းမှု - ဖုန်မှုန့်၊ အမှုန်အမွှား - ဒေသခံလူထု ဘေးအန္တရာယ် ကင်းရှင်းရေး နှင့် ကျန်းမာရေး - ယာဉ် အသွားအလာ - ရေနုတ်မြောင်း ပိတ်ဆို့မှု
		နွားနို့တော်စုကျေးရွာ	မြင့်မား	နီးကပ်စွာ တည်ရှိခြင်း	
		ရွာသစ်ကျေးရွာ	မြင့်မား	နီးကပ်စွာ တည်ရှိခြင်း	
		တဲနန်းသာကျေးရွာ	မြင့်မား	နီးကပ်စွာ တည်ရှိခြင်း	
၂	အစိုးရ အဖွဲ့အစည်းများ	အထွေထွေအုပ်ချုပ်ရေးဦးစီးဌာန	နည်းပါး	အထွေထွေ အုပ်ချုပ်ရေး လုပ်ငန်းများ	
		မြို့နယ် ပညာရေးမှူးရုံး	အလယ်အလတ်	CSR နှင့် ဆက်စပ်၍	
		မြေစာရင်းဦးစီးဌာန	နည်းပါး	မြေယာပြဿနာ မရှိ	
		မြို့နယ် ပြည်သူ့ကျန်းမာရေး ဦးစီးဌာန	နည်းပါး	အထွေထွေ ကျန်းမာရေး ကိစ္စရပ်များ	

		မြို့နယ် ပတ်ဝန်းကျင် ထိန်းသိမ်းရေး ဦးစီးဌာန	ရုံးဖွင့်လှစ် ထားခြင်း မရှိ		
		မြို့နယ် မီးသတ်တပ်ဖွဲ့	နည်းပါး	-	
		မန္တလေး မြို့တော် စည်ပင်သာယာရေး ကော်မတီ	အလယ် အလတ်		- စွန့်ပစ်အစိုင်အခဲ - ရေနုတ်မြောင်း စနစ် - စွန့်ပစ်ရေ - ယာဉ်ကြော - ရေအသုံးပြုမှု
၃	စီမံကိန်း အဆိုပြုသူ	စီမံကိန်း စီမံခန့်ခွဲရေး စီမံကိန်း တည်ဆောက်ရေး ကန်ထရိုက်များ	မြင့်မား	- စီမံကိန်းပိုင်ရှင်	- လုပ်ငန်းလည်ပတ်မှုနှင့် စီမံခန့်ခွဲရေး - တည်ဆောက်ရေး - ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှုအစီအစဉ်
၄	အခြား စိတ်ပါဝင်စား သည့် အစုအဖွဲ့	မရှိပါ	-	-	-

၄.၃.၂ စီမံကိန်းသက်ရောက်ဧရိယာ

စီမံကိန်းနှင့် သက်ဆိုင်သူများဆန်းစစ်ချက်ရလဒ်ကို အခြေခံ၍ စီမံကိန်းသက်ရောက် ဧရိယာကို ပိုင်းခြားသတ်မှတ်ခဲ့ပါသည်။ အခြေချနေထိုင်မှုများ၊ မီးဘေးအန္တရာယ်၊ ဆူညံသံ၊ ဇီဝဝန်းကျင်နှင့် မြေယာဝန်းကျင်တို့ကို အောက်ဖော်ပြပါ ဇယားတွင် ဖော်ပြထားပါသည်။

ဇယား ၈၊ စီမံကိန်းသက်ရောက်ဧရိယာ

စဉ်	အမျိုးအစား	တည်နေရာ	အကြောင်းခံ
၁	အခြေချနေထိုင်မှု	တောင်သမန်ကျေးရွာ	ဆက်သွယ်ရေးလမ်း
		နွားနို့တော်စုကျေးရွာ	
		ရွာသစ်ကျေးရွာ	
		တဲနန်းသာကျေးရွာ	
၂	မြေယာဝန်းကျင်	အနီးရှိ စိုက်ပျိုးမြေများ စီမံကိန်းပရဝုဏ်	စွန့်ပစ်ပစ္စည်း ရေသွင်းမြောင်းများ

			မြေဆီလွှာ
၃	ဧဝဝန်းကျင်	စီမံကိန်းမှ ၅ ကီလိုမီတာ ဝန်းကျင်	ညစ်ညမ်းမှု
4	လေထုနှင့် ဆူညံသံ ဝန်းကျင်	စီမံကိန်းပရဝုဏ်နှင့် အနီးဝန်းကျင်	ဆူညံသံအဆင့်
၅	ရေထုဝန်းကျင်	တောင်သမန်အင်းနှင့် မြေအောက်ရေ	ရေသုံးစွဲမှု ရေအရည်အသွေး စွန့်ပစ်ရေ

၄.၄၊ ယဉ်ကျေးမှုအမွေအနှစ်များ

တောင်သမန်အပန်းဖြေစခန်း စီမံကိန်းအနီးတွင် နိုင်ငံ့အမွေအနှစ်စာရင်းဝင် ဦးပိန် တံတား တည်ရှိသည့်အပြင် အဆိုပြုစီမံကိန်း အကောင်အထည်ဖော်မှုကြောင့် ထိခိုက် နိုင်ခြေရှိသည့် အခြားရှေးဟောင်းအမွေအနှစ်နေရာများလည်း တည်ရှိပါသည်။ ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်း အစီရင်ခံစာတွင် ထည့်သွင်းစဉ်းစားခဲ့သော ယင်းရှေးဟောင်း အမွေအနှစ် နေရာများကို အောက်တွင် ဖော်ပြထားပါသည်။

ဇယား ၄၊ **စီမံကိန်းအနီးဝန်းကျင် ယဉ်ကျေးမှုအမွေအနှစ်စာရင်း**

နေရာ	စာရင်း ဝင်/ မဝင်	မြေအသုံးချမှု အမျိုးအစား	တည်နေရာ	မှတ်ချက်
တောင်သမန်အင်း	စာရင်းဝင်	ရောက်ဆိုင်ရာ စီမံခန့်ခွဲမှု	အမရပူရမြို့နယ်	
ဦးပိန်တံတား	စာရင်းဝင်	လမ်းကြောင်း ယဉ်ကျေး မှု ဆိုင်ရာ ရှုခင်း	တောင်သမန်အင်း	
မဟာသကျရံသီ တောင်သမန် ကျောက်တော်ကြီး	စာရင်းဝင်	ယဉ်ကျေးမှု	တောင်သမန်ကျေးရွာ	
ပုထိုးတော်ကြီးဘုရား (မဟာဝိဇယရံသီ)	စာရင်းဝင်	ယဉ်ကျေးမှု	တောင်သမန်အင်း မြောက်အရပ်	
အောင်မြေဓာတ်တော် ဘုရား	စာရင်း မဝင်	ယဉ်ကျေးမှု	တောင်သမန်ကျေးရွာ	

ရွှေမုဋ္ဌောဘုရား	စာရင်း မဝင်	ယဉ်ကျေးမှု	တောင်သမန်ကျေးရွာ	
ကန်ဦး ဘုန်းတော်ကြီးကျောင်း	စာရင်း မဝင်	ယဉ်ကျေးမှု	ရွာသစ်ကျေးရွာ	
တဲနန်းသာဘုရား	စာရင်း မဝင်	ယဉ်ကျေးမှု	အေးမြသာယာ ဘုန်းတော်ကြီးကျောင်းဝန်း	

၅။ သက်ရောက်မှုဆန်းစစ်ခြင်းနှင့် လျော့ပါးသက်သာရေးနည်းလမ်းများ

စီမံကိန်းလုပ်ငန်းဆောင်ရွက်ချက်များသည် ပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာ တုံ့ပြန်မှု များနှင့် ဆက်စပ်နေပြီး ၎င်းတို့၏ အပြန်အလှန်ဆက်သွယ်မှုများကို အလားအလာရှိသော သဘာဝ ပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာ သက်ရောက်မှုများအတွက် ဖော်ထုတ်ခဲ့သည်။ ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်း ဆောင်ရွက်ခဲ့သည့်အဖွဲ့အနေဖြင့် ယခုစီမံကိန်းမှ ပတ်ဝန်းကျင်အပေါ် အဓိကသက်ရောက်နိုင်မည့် ပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာ ရှုထောင့် ၁၄ ခု စီစစ်ဖော်ထုတ် သတ်မှတ်ခဲ့ပါသည်။

၅.၁၊ သက်ရောက်မှုစီစစ်သတ်မှတ်ခြင်း

၅.၁.၁၊ တည်ဆောက်ရေးကာလ

တောင်သမန်အပန်းဖြေစခန်းစီမံကိန်း၏ တည်ဆောက်ရေးကာလအတွင်း သက်ရောက်မှုများ ဖြစ်ပေါ်နိုင်မည့် ပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာ ရှုထောင့် ၁၁ ခုမှ အောက်ပါအတိုင်းဖြစ်ပါသည်-

1။ ဇီဝမျိုးစုံမျိုးကွဲအပေါ် သက်ရောက်မှုများ
2။ လေထုအရည်အသွေးအပေါ် သက်ရောက်မှုများ
3။ ရေထုအပေါ် သက်ရောက်မှုများ
4။ မြေဆီလွှာအပေါ်သက်ရောက်မှုများ
5။ ဆူညံသံနှင့် တုန်ခါမှုတို့မှ သက်ရောက်မှုများ
6။ ယာဉ်သွားလာမှုအပေါ် သက်ရောက်မှုများ
7။ ယဉ်ကျေးမှုအမွေအနှစ်အပေါ် သက်ရောက်မှုများ
8။ စွန့်ပစ်အစိုင်အခဲထွက်ရှိမှုမှ သက်ရောက်မှုများ
9။ ဘေးအန္တရာယ်ရှိစွန့်ပစ်ပစ္စည်းများမှ သက်ရောက်မှုများ
10။ လုပ်ငန်းခွင် ဘေးအန္တရာယ်ကင်းရှင်းရေးနှင့် ကျန်းမာရေးအပေါ် သက်ရောက်မှုများ
11။ စီမံကိန်းအနီးဒေသစီးပွားရေးအပေါ် သက်ရောက်မှုများ

၅.၁.၂၊ လုပ်ငန်းလည်ပတ်ရေးကာလ

တောင်သမန်အပန်းဖြေစခန်းစီမံကိန်း၏ လုပ်ငန်းလည်ပတ်ရေးကာလအတွင်း သက်ရောက်မှုများ ဖြစ်ပေါ်နိုင်မည့် ပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာ ရှုထောင့် ၁၄ ခုမှ အောက်ပါအတိုင်းဖြစ်ပါသည်-

1။ ဇီဝမျိုးစုံမျိုးကွဲအပေါ် သက်ရောက်မှုများ

2။ လေထုအရည်အသွေးအပေါ် သက်ရောက်မှုများ
3။ ရေထုအပေါ် သက်ရောက်မှုများ
4။ မြေဆီလွှာအပေါ်သက်ရောက်မှုများ
5။ ဆူညံသံနှင့် တုန်ခါမှုတို့မှ သက်ရောက်မှုများ
6။ စွမ်းအင်သုံးစွဲမှုအပေါ် သက်ရောက်မှုများ
7။ ယာဉ်သွားလာမှုအပေါ် သက်ရောက်မှုများ
8။ ယဉ်ကျေးမှုအမွေအနှစ်အပေါ် သက်ရောက်မှုများ
9။ ရှုမြင်ကွင်းအပေါ်သက်ရောက်မှုများ
10။ မီးဘေးအန္တရာယ်မှ သက်ရောက်မှုများ
11။ စွန့်ပစ်အစိုင်အခဲထွက်ရှိမှုမှ သက်ရောက်မှုများ
12။ ဘေးအန္တရာယ်ရှိစွန့်ပစ်ပစ္စည်းများမှ သက်ရောက်မှုများ
13။ လုပ်ငန်းခွင် ဘေးအန္တရာယ်ကင်းရှင်းရေးနှင့် ကျန်းမာရေးအပေါ် သက်ရောက်မှုများ
14။ စီမံကိန်းအနီးဒေသစီးပွားရေးအပေါ် သက်ရောက်မှုများ

၅.၂။ သက်ရောက်မှုဆန်းစစ်ခြင်း

စိစစ်ဖော်ထုတ်ခဲ့သည့် သက်ရောက်မှုများကို Rating Matrix နည်းလမ်းဖြင့် ဆန်းစစ်ခြင်း ဆောင်ရွက်ခဲ့ပြီး ဆန်းစစ်ချက်ရလဒ်များအနှစ်ချုပ်ကို အောက်ပါဇယားများတွင် ဖော်ပြထားပါသည်-

ဇယား ၈၊ လျော့ပါးသက်သာရေးအစီအမံများ ဆောင်ရွက်ခြင်းမပြုပါက သက်ရောက်မှုအဆင့် သတ်မှတ်ချက်

တည်ဆောက်ရေးကာလ								
စဉ်	သက်ရောက်မှု	ပြင်းထန်မှု	နယ်ပယ်	ကြာမြင့်ချိန်	အကြိမ်ရေ	ဖြစ်နိုင်ခြေ	စုစုပေါင်း အမှတ်	သိသာ ထင်ရှားမှု အဆင့်
၁	ဇီဝမျိုးစုံမျိုးကွဲအပေါ် သက်ရောက်မှုများ	၃	၃	၄	၄	၄	၈၀	အလယ်အလတ် - မြင့်မား
၂	လေထုအရည်အသွေးအပေါ် သက်ရောက်မှုများ	၄	၃	၃	၄	၄	၈၀	အလယ်အလတ် - မြင့်မား
၃	ရေထုအပေါ် သက်ရောက်မှုများ	၄	၃	၃	၄	၄	၈၀	အလယ်အလတ် - မြင့်မား
၄	မြေဆီလွှာအပေါ် သက်ရောက်မှုများ	၄	၂	၂	၄	၄	၅၆	နည်းပါး - အလယ်အလတ်
၅	ဆူညံသံနှင့် တုန်ခါမှုတို့မှ သက်ရောက်မှုများ	၄	၃	၃	၄	၄	၈၀	အလယ်အလတ် - မြင့်မား

၆	ယာဉ်သွားလာမှုအပေါ် သက်ရောက်မှုများ	၄	၃	၃	၅	၄	၉၀	အလယ်အလတ် - မြင့်မား
၇	ယဉ်ကျေးမှုအမွေအနှစ်အပေါ် သက်ရောက်မှုများ	၄	၃	၃	၄	၄	၈၀	အလယ်အလတ် - မြင့်မား
၈	စွန့်ပစ်အစိုင်အခဲထွက်ရှိမှုမှ သက်ရောက်မှုများ	၄	၂	၃	၅	၄	၈၁	အလယ်အလတ် - မြင့်မား
၉	ဘေးအန္တရာယ်ရှိ စွန့်ပစ်ပစ္စည်းမှ သက်ရောက်မှုများ	၄	၂	၃	၃	၄	၆၃	နည်းပါး - အလယ်အလတ်
၁၀	လုပ်ငန်းခွင် ဘေးအန္တရာယ် ကင်းရှင်းရေးနှင့် ကျန်းမာရေးအပေါ် သက်ရောက်မှုများ	၅	၂	၃	၄	၄	၈၀	အလယ်အလတ် - မြင့်မား
၁၁	စီမံကိန်းအနီးဒေသစီးပွားရေးအပေါ် သက်ရောက်မှုများ	၄	၃	၄	၅	၄	၉၉	အလယ်အလတ် - မြင့်မား

လုပ်ငန်းလည်ပတ်ရေးကာလ

စဉ်	သက်ရောက်မှု	ပြင်းထန်မှုအဆင့်	နယ်ပယ်	ကြာမြင့်ချိန်	ဖြစ်နိုင်ခြေ	စုစုပေါင်း	သိသာထင်ရှားမှုအဆင့်
၁	ဧဝမျိုးစုံမျိုးကွဲအပေါ် သက်ရောက်မှုများ	၂	၃	၄	၁	၃	၃၆	နည်းပါး
၂	လေထုအရည်အသွေးအပေါ် သက်ရောက်မှုများ	၃	၃	၄	၃	၃	၆၀	နည်းပါး - အလယ်အလတ်
၃	ရေထုအပေါ် သက်ရောက်မှုများ	၄	၃	၄	၄	၄	၁၁၀	မြင့်မား
၄	မြေဆီလွှာအပေါ် သက်ရောက်မှုများ	၃	၁	၄	၂	၄	၄၈	နည်းပါး
၅	ဆူညံသံနှင့် တုန်ခါမှုတို့မှ သက်ရောက်မှုများ	၃	၁	၄	၂	၄	၄၈	နည်းပါး
၆	စွမ်းအင်သုံးစွဲမှုအပေါ် သက်ရောက်မှုများ	၄	၃	၄	၄	၄	၉၉	အလယ်အလတ် - မြင့်မား
၇	ယာဉ်သွားလာမှုအပေါ် သက်ရောက်မှုများ	၄	၃	၄	၄	၄	၉၉	အလယ်အလတ် - မြင့်မား
၈	ယဉ်ကျေးမှုအမွေအနှစ်အပေါ် သက်ရောက်မှုများ	၃	၃	၄	၄	၄	၈၀	အလယ်အလတ် - မြင့်မား

၉	ရှုမြင်ကွင်းအပေါ် သက်ရောက်မှုများ	၃	၃	၄	၄	၄	၈၀	အလယ်အလတ် - မြင့်မား
၁၀	မီးဘေးအန္တရာယ်မှ သက်ရောက်မှုများ	၅	၃	၁	၅	၄	၈၁	အလယ်အလတ် - မြင့်မား
၁၁	စွန့်ပစ်အစိုင်အခဲထွက်ရှိမှုမှ သက်ရောက်မှုများ	၄	၃	၄	၅	၄	၉၉	အလယ်အလတ် - မြင့်မား
၁၂	ဘေးအန္တရာယ်ရှိ စွန့်ပစ်ပစ္စည်းမှ သက်ရောက်မှုများ	၃	၂	၄	၃	၄	၆၃	နည်းပါး - အလယ်အလတ်
၁၃	လုပ်ငန်းခွင် ဘေးအန္တရာယ် ကင်းရှင်းရေးနှင့် ကျန်းမာရေးအပေါ် သက်ရောက်မှုများ	၃	၁	၄	၄	၄	၆၄	နည်းပါး - အလယ်အလတ်
၁၄	စီမံကိန်းအနီးဒေသစီးပွားရေး အပေါ် သက်ရောက်မှုများ	၄	၃	၄	၅	၄	၉၉	အလယ်အလတ် - မြင့်မား

ဇယား ဆ၊ လျှော့ပါးသက်သာရေးအစီအမံများ ဆောင်ရွက်ပါက သက်ရောက်မှုအဆင့်သတ်မှတ်ချက်

တည်ဆောက်ရေးကာလ								
စဉ်	သက်ရောက်မှု	ပြင်းထန်မှု	နယ်ပယ်	ကြာမြင့်ချိန်	အကြိမ်ရေ	ဖြစ်နိုင်ခြေ	စုစုပေါင်း အမှတ်	သိသာ ထင်ရှားမှု အဆင့်
၁	ဇီဝမျိုးစုံမျိုးကွဲအပေါ် သက်ရောက်မှုများ	၂	၃	၄	၂	၃	၄၅	နည်းပါး
၂	လေထုအရည်အသွေးအပေါ် သက်ရောက်မှုများ	၂	၂	၃	၃	၃	၄၂	နည်းပါး
၃	ရေထုအပေါ် သက်ရောက်မှုများ	၂	၂	၃	၃	၃	၄၂	နည်းပါး
၄	မြေဆီလွှာအပေါ် သက်ရောက်မှုများ	၃	၃	၂	၃	၃	၄၈	နည်းပါး
၅	ဆူညံသံနှင့် တုန်ခါမှုတို့မှ သက်ရောက်မှုများ	၃	၂	၃	၃	၃	၄၈	နည်းပါး
၆	ယာဉ်သွားလာမှုအပေါ် သက်ရောက်မှုများ	၂	၂	၃	၄	၂	၄၂	နည်းပါး

၇	ယဉ်ကျေးမှုအမွေအနှစ်အပေါ် သက်ရောက်မှုများ	၂	၃	၃	၃	၃	၄၈	နည်းပါး
၈	စွန့်ပစ်အစိုင်အခဲထွက်ရှိမှုမှ သက်ရောက်မှုများ	၂	၂	၃	၄	၂	၄၂	နည်းပါး
၉	ဘေးအန္တရာယ်ရှိ စွန့်ပစ်ပစ္စည်းမှ သက်ရောက်မှုများ	၂	၂	၃	၃	၃	၄၂	နည်းပါး
၁၀	လုပ်ငန်းခွင် ဘေးအန္တရာယ် ကင်းရှင်းရေးနှင့် ကျန်းမာရေးအပေါ် သက်ရောက်မှုများ	၃	၁	၃	၃	၃	၄၂	နည်းပါး
၁၁	စီမံကိန်းအနီးဒေသစီးပွားရေးအပေါ် သက်ရောက်မှုများ	၄	၃	၄	၅	၅	၁၁၀	မြင့်မား

လုပ်ငန်းလည်ပတ်ရေးကာလ

စဉ်	သက်ရောက်မှု	ပြင်းထန်မှု	နယ်ပယ်	ကြာမြင့်ချိန်	အကြိမ်ရေ	ဖြစ်နိုင်ခြေ	စုစုပေါင်း	သိသာထင်ရှားမှုအဆင့်
၁	ဇီဝမျိုးစုံမျိုးကွဲအပေါ် သက်ရောက်မှုများ	၂	၂	၄	၁	၂	၂၄	အလွန် နည်းပါး
၂	လေထုအရည်အသွေးအပေါ် သက်ရောက်မှုများ	၂	၂	၄	၃	၂	၄၀	နည်းပါး
၃	ရေထုအပေါ် သက်ရောက်မှုများ	၂	၃	၄	၃	၂	၄၂	နည်းပါး
၄	မြေဆီလွှာအပေါ် သက်ရောက်မှုများ	၁	၁	၄	၁	၁	၁၂	အလွန် နည်းပါး
၅	ဆူညံသံနှင့် တုန်ခါမှုတို့မှ သက်ရောက်မှုများ	၂	၂	၄	၃	၂	၄၀	နည်းပါး
၆	စွမ်းအင်သုံးစွဲမှုအပေါ် သက်ရောက်မှုများ	၃	၃	၄	၄	၂	၆၀	နည်းပါး - အလယ်အလတ်
၇	ယာဉ်သွားလာမှုအပေါ် သက်ရောက်မှုများ	၂	၂	၄	၄	၂	၄၈	နည်းပါး
၈	ယဉ်ကျေးမှုအမွေအနှစ်အပေါ် သက်ရောက်မှုများ	၂	၃	၄	၃	၂	၄၅	နည်းပါး
၉	ရှုမြင်ကွင်းအပေါ် သက်ရောက်မှုများ	၂	၃	၄	၃	၂	၄၅	နည်းပါး

၁၀	မီးဘေးအန္တရာယ်မှ သက်ရောက်မှုများ	၂	၂	၁	၅	၂	၃၅	နည်းပါး
၁၁	စွန့်ပစ်အစိုင်အခဲထွက်ရှိမှုမှ သက်ရောက်မှုများ	၂	၂	၄	၄	၂	၄၈	နည်းပါး
၁၂	ဘေးအန္တရာယ်ရှိ စွန့်ပစ်ပစ္စည်းမှ သက်ရောက်မှုများ	၂	၁	၄	၃	၃	၄၂	နည်းပါး
၁၃	လုပ်ငန်းခွင် ဘေးအန္တရာယ် ကင်းရှင်းရေးနှင့် ကျန်းမာရေးအပေါ် သက်ရောက်မှုများ	၂	၁	၄	၃	၂	၃၅	နည်းပါး
၁၄	စီမံကိန်းအနီးဒေသစီးပွားရေး အပေါ် သက်ရောက်မှုများ	၄	၃	၄	၅	၅	၁၁၀	မြင့်မား

၆။ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်

ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်၏ အဓိကရည်ရွယ်ချက်မှာ ပတ်ဝန်းကျင်ဆိုင်ရာ ပြဿနာရပ်များကို ကာကွယ်ရန်အတွက် စိစစ်ဖော်ထုတ်ခဲ့သော ဖြစ်နိုင်ချေရှိ သက်ရောက်မှု များကို သတ်မှတ်အချိန်ကာလအတွင်း စနစ်တကျစီမံခန့်ခွဲနိုင်ရန်နှင့် အဖွဲ့အစည်းများကြား အခန်းကဏ္ဍနှင့် တာဝန်ခွဲဝေမှုများ ရှင်းလင်းစေရန်ဖြစ်ပါသည်။ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်သည် အဆိုပြုစီမံကိန်းအနေဖြင့် ပတ်ဝန်းကျင်ဆိုင်ရာ တည်ဆဲဥပဒေ နည်းဥပဒေ များအပြင် ပတ်ဝန်းကျင်ရေရှည်တည့်တံ့မှုအလေ့အကျင့်များနှင့်အညီ လုပ်ငန်း အကောင် အထည်ဖော်ဆောင်ရွက်စေရန်အတွက် ရေးဆွဲထားသော စီမံကိန်းအတွက် သီးခြားအစီအစဉ် တစ်ရပ်ဖြစ်ပါသည်။

၆.၁၊ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် အကောင်အထည်ဖော်မည့်အဖွဲ့ (EMPIT)

အဆိုပြုစီမံကိန်း၏ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်ကို အောက်ဖော်ပြပါ အဖွဲ့များ ဖွဲ့စည်း၍ ဆောင်ရွက်သွားမည်ဖြစ်ပါသည်-

No.	EMP Implementation Team Member	Roles
1.	စီမံကိန်းဒါရိုက်တာ	• ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်အပါအဝင် လျော့ပါးစေရေး အစီအမံများတို့ကို အကောင်အထည်ဖော်ခြင်းနှင့် စောင့်ကြပ် ကြည့်ရှုခြင်း. • သဘာဝပတ်ဝန်းကျင်ဆိုင်ရာ စဉ်းစားမှုများကို စီမံကိန်း ရေးဆွဲစဉ် ကာလ၌ ထည့်သွင်းစဉ်းစားဆုံးဖြတ်ပေးခြင်း လုပ်ငန်းစဉ်တို့တွင် ပေါင်းစပ်ညှိနှိုင်းပေးခြင်း၊

2.	စီမံကိန်းမန်နေဂျာ	• Supports the Head of team in implementing the EMP and managing environmen initiatives. • Assists in data collection, analysis, and reporting related to environmental performance indicators.
3.	စီမံကိန်း အင်ဂျင်နီယာ	• ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်ကို အကောင်အထည်ဖော်ရန်နှင့် ပတ်ဝန်းကျင်ဆိုင်ရ စီမံခန့်ခွဲမှုများတွင် အဖွဲ့ခေါင်းဆောင်ကို ပံ့ပိုးပေးခြင်း၊ အချက်အလက်များ စုဆောင်းပေးခြင်း၊ ခွဲခြမ်းစိတ်ဖြာပေးခြင်းနှင့် ပတ်ဝန်းကျင်ဆိုင်ရာ အညွှန်ကိန်းများကို လေ့လာခြင်း
4.	ဘေးအန္တရာယ်ကင်းရှင်းရေးနှင့်ကျန်းမာရေးဆိုင်ရာ ကျွမ်း ကျင် သူ	• စီမံကိန်းအတွင် အများပြည်သူများနှင့် ဝန်ထမ်းများ ဘေးအန္တရာယ် ကင်းရှင်း လုံခြုံ • ပတ်ဝန်းကျင်ဆိုင်ရာ အကြောင်းအချက်များနှင့် ဆက်စပ်၍ ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေးဆိုင်ရာများကို ဖော်ထုတ်ခြင်း
5.	အုပ်ချုပ်ရေး အထောက်အကူပြု အဖွဲ့ဝင်	• ပတ်ဝန်းကျင် • အချိန်မှီဆောင်ရွက်ရန်လုပ်ငန်းများ၊ ဥပဒေရေးရာပြောင်းလဲမှုများ၊ နှင့် လိုက်နာဆောင်ရွက်ရမည့်အကြောင်းအရာများအား အဖွဲ့သို့ အချိန်မှီ သတိပေးခြင်းဆောင်ရွက်ရန်။ • အဖွဲ့အတွင်းလူအားလုံးဆက်သွယ်ဆောင်ရွက်နိုင်ရန်စီစဉ်ပေးခြင်း၊ အစည်းအဝေးများညှိနှိုင်းစီစဉ်ပေးခြင်း၊ ရောက်သည့်နေရာမှ အများ စုပေါင်းဆွေးနွေးနိုင်သော Conference Call များလိုအပ်ပါက စီစဉ်ပေးရန်။
၆.	အုပ်ချုပ်ရေး ရုံးအဖွဲ့မှူး	• ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်အားအကောင်အထည်ဖော်မှုအားကြီးကြပ်ပေးရန်၊ ပတ်ဝန်းကျင်ဆိုင်ရာနည်းဥပဒေများ၊ပေါ်လစီများနှင့်အညီဆောင်ရွက်ရန် တိုက်တွန်း • ပတ်ဝန်းကျင်နှင့်ဆိုင်သောကိစ္စရပ်များနှင့်ပတ်သက်၍ သက်ဆိုင်ရာ အဖွဲ့အစည်းများ၊အကျိုးသက်ဆိုင်သူများ၊ စီမံကိန်းမှတာဝန်ရှိသူများနှင့်တွေ့ဆုံဆွေးနွေးရန်အဓိကဆက်သွယ်ရန်ပုဂ္ဂိုလ်တာဝန်

၆.၂ တည်ဆောက်ရေးကာလ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် အနှစ်ချုပ်

ပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာ အဓိက ကဏ္ဍများ	စီမံခန့်ခွဲရေးအစီအမံများ	စီမံခန့်ခွဲမည့် နေရာ	စီမံခန့်ခွဲမည့် အချိန်ကာလ	စီမံခန့်ခွဲမည့် အဖွဲ့အစည်း
လေထုအရည်အသွေး	တည်ဆောက်ရေးကာလအတွင်း ဖုန်မှုန့်ထွက် ရှိသည့်နေရာများကို တစ်ရက်လျှင် နှစ်ကြိမ် ရေဖြန်းရမည် နောက်ပွင့်ထရပ်ကားများဖြင့် ကုန်ကြမ်းပစ္စည်းများ ပို့ဆောင် အတင်အချ ဆောင်ရွက်စဉ် လုံအပ် သောအဖုံးအကာများဖြင့် ဖုံးအုပ်ထားရမည်။ ဆောက်လုပ်ရေးကုန်ကြမ်းပစ္စည်းအစုအပုံများကို လူနေအိမ်ခြေများမှ (အနည်းဆုံး မီတာ ၁၀၀) အကွာတွင် ထားရှိရမည်။ ရွှေ့လျားယာဉ်နှင့် အသေတပ်ဆင်ထားသော စက်ပစ္စည်းများကို ပုံမှန်စစ်ဆေးထိန်းသိမ်းမှုများ ဆောင်ရွက်ရမည်။	တောင်သမန်အပန်းဖြေစခန်း တည်ဆောက်ရေးစီမံကိန်း ပရဝုဏ်	တည်ဆောက်ရေး ကာလ တလျှောက်လုံး	**အကောင်အထည်ဖော်မှု** • တည်ဆောက်ရေးကာလ EMPIT • သက်ဆိုင်ရာ ဆပ်ကန်ထရိုက်တာများ **ကြီးကြပ်မှု** • MoNREC • ECD (ဦးစီးရုံးချုပ်) • ECD (မန္တလေး) • တောင်သမန်သစ္စာ ကုမ္ပဏီလီမိတက် စီမံခန့်ခွဲရေး **အစီရင်ခံတင်ပြခြင်း** • MoNREC • ECD (ဦးစီးရုံးချုပ်) • ECD (မန္တလေး)
ရေထုဝန်းကျင်	တည်ဆောက်ရေးလုပ်ငန်းမှထွက်ရှိသော စွန့်ပစ်ရေများကို အနည်ထိုင်ကန်ငယ်များတွင် အနည်ထိုင်စေပြီး ကြည်လင်နေသော ရေများကိုသာ	တောင်သမန်အပန်းဖြေစခန်း တည်ဆောက်ရေးစီမံကိန်း ပရဝုဏ်	တည်ဆောက်ရေး ကာလ တလျှောက်လုံး	**အကောင်အထည်ဖော်မှု** • တည်ဆောက်ရေးကာလ EMPIT

	လမ်းမဖက်ရှိ ရေနုတ်မြောင်းများသို့ စွန့်ပစ်ရမည်။ တည်ဆောက်ရေးလုပ်ငန်းမှ ရွှံ့ရေများကို ရေနုတ် မြောင်း သို့မဟုတ် အနီးရှိ ရေထုအတွင်းသို့ တိုက် ရိုက်စွန့်ပစ်ခြင်း သို့မဟုတ် တိုက်ရိုက်စီးဆင်း စေခြင်းမှ ကာကွယ်ရမည်။ စီမံကိန်းဧရိယာအတွင်း MCDC ၏ လမ်းညွှန်မှု ဖြင့် ရေနုတ်မြောင်းများ လုံလောက်စွာ တည် ဆောက်ရမည်။ အချို့လုပ်ငန်းများမှ ထွက်ရှိလာသော ပြန်လည် အသုံးပြု၍ရသည့် ရေများကို အခြားလုပ်ငန်း များတွင် အသုံးပြုရမည်။ (ဥပမာ - ဖုန်မှုန့်များ ရေဖြန်းခြင်း၊ တည်ဆောက်ရေး လုပ်ငန်းခွင် သန့်ရှင်းရေး) ပိုက်လိုင်းများ ယိုစိမ့်ထွက်မှုကို အခါအား လျော်စွာ စစ်ဆေးရမည်။ ရေသုံးစွဲမှုကို လျှော့ချနိုင်မည့် ပိုက်ဆက်ပစ္စည်း များ အသုံးပြုရမည်။			• သက်ဆိုင်ရာ ဆပ်ကန်ထရိုက်တာများ **ကြီးကြပ်မှု** • MoNREC • ECD (ဦးစီးရုံးချုပ်) • ECD (မန္တလေး) • MCDC • တောင်သမန်သစ္စာ ကုမ္ပဏီလီမိတက် စီမံခန့်ခွဲရေး **အစီရင်ခံတင်ပြခြင်း** • MoNREC • ECD (ဦးစီးရုံးချုပ်) • ECD (မန္တလေး)

မြေဆီလွှာ	အလွန်အကျွံတူးဖော်ခြင်းမှ ကာကွယ်ရန်နှင့် မြေမျက်နှာပြင် ချိန်ညှိနိုင်ရန် မြေတူးဖော်ခြင်းနှင့် မြေဖို့ခြင်းလုပ်ငန်းစဉ်ကို အနီးကပ်စောင့်ကြပ်ကြည့်ရှုရမည်။ မြေတူးဖော်ပြီး မကြာမီပင် တည်ဆောက်ရေး လုပ်ငန်းများ စတင်ရမည်။ မြေဆီလွှာညစ်ညမ်းနိုင်မည့် ဇရိယာ (ဥပမာ - ဆီယိုဖိတ်ခြင်း) ကို စိစစ်၍ လိုအပ်မည့် ပြန်လည် ကုစားရေးအစီအမံများ ဖော်ထုတ်ရန် စီမံကိန်းလုပ်ငန်းခွင်ကို အခါအားလျော်စွာ စစ်ဆေးရမည်။	တောင်သမန်အပန်းဖြေစခန်း တည်ဆောက်ရေးစီမံကိန်း ပရဝုဏ်	တည်ဆောက်ရေး ကာလ တလျှောက်လုံး	**အကောင်အထည်ဖော်မှု** • တည်ဆောက်ရေးကာလ EMPIT • သက်ဆိုင်ရာ ဆပ်ကန်ထရိုက်တာများ **ကြီးကြပ်မှု** • MoNREC • ECD (ဦးစီးရုံးချုပ်) • ECD (မန္တလေး) • တောင်သမန်သစ္စာ ကုမ္ပဏီလီမိတက် စီမံခန့်ခွဲရေး **အစီရင်ခံတင်ပြခြင်း** • MoNREC • ECD (ဦးစီးရုံးချုပ်) • ECD (မန္တလေး)
ဆူညံသံနှင့် တုန်ခါမှု	သဘာဝပေါက်ပင်များကို အပြောင်ရှင်းလင်းခြင်း မပြုလုပ်ရ။ ဆူညံသံနှင့် တုန်ခါမှုနည်းပါးသော Pile ရိုက်သည့် စနစ်ကို အသုံးပြုရမည်။ ပြုပြင်ထိန်းသိမ်းရေးလုပ်ငန်းများ ပုံမှန်ဆောင်ရွက်ရမည်။	တောင်သမန်အပန်းဖြေစခန်း တည်ဆောက်ရေးစီမံကိန်း ပရဝုဏ်	တည်ဆောက်ရေး ကာလ တလျှောက်လုံး	**အကောင်အထည်ဖော်မှု** • တည်ဆောက်ရေးကာလ EMPIT • သက်ဆိုင်ရာ ဆပ်ကန်ထရိုက်တာများ **ကြီးကြပ်မှု** • MoNREC • ECD (ဦးစီးရုံးချုပ်)

	ဆူညံသံမြင့်မားသည့် တည်ဆောက်ရေး လုပ်ငန်းများကို ညအချိန် ဆောင်ရွက်ခြင်း ရှောင်ကြဉ်ရမည်။ လုပ်သားများအအတွက် ဆောက်လုပ်ရေး လုပ်ငန်းသုံး နားကြပ်များ ထောက်ပံ့ရမည်။			• ECD (မန္တလေး) • တောင်သမန်သစ္စာ ကုမ္ပဏီလီမိတက် စီမံခန့်ခွဲရေး **အစီရင်ခံတင်ပြခြင်း** • MoNREC • ECD (ဦးစီးရုံးချုပ်) • ECD (မန္တလေး)
ယဉ်ကျေးမှုအမွေအနှစ်	တုန်ခါမှုများလျော့နည်းစေရန် တည်ဆောက်ရေး လုပ်ငန်းများကို စနစ်တကျဆောင်ရွက်ရမည်။ ယဉ်ကျေးမှုအမွေအနှစ်အဆောက်အဦများနှင့် ယဉ်ကျေးမှုဆိုင်ရာရှုမြင်ကွင်းများကို ပျက်စီး စေခြင်း သို့မဟုတ် ပြောင်းလဲစေခြင်းများ မပြုလုပ်ရ။ ယဉ်ကျေးမှုအမွေအနှစ်ဝန်းကျင်တွင် မီတာ ၄၀ ထက် မြင့်သော အဆောက်အဦများ တည် ဆောက်ခြင်း မပြုရ ဆိုသော MCDC ၏ ညွှန်ကြားချက်နှင့်အညီ လိုက်နာရမည်။	တောင်သမန်အပန်းဖြေစခန်း တည်ဆောက်ရေးစီမံကိန်း ပရဝုဏ်	တည်ဆောက်ရေး ကာလ တလျှောက်လုံး	**အကောင်အထည်ဖော်မှု** • တည်ဆောက်ရေးကာလ EMPIT • သက်ဆိုင်ရာ ဆပ်ကန်ထရိုက်တာများ **ကြီးကြပ်မှု** • MoNREC • ECD (ဦးစီးရုံးချုပ်) • ECD (မန္တလေး) • MCDC • ရှေးဟောင်းသုတေသနနှင့် အမျိုးသားပြတိုက် ဦးစီးဌာန • တောင်သမန်သစ္စာ ကုမ္ပဏီလီမိတက် စီမံခန့်ခွဲရေး **အစီရင်ခံတင်ပြခြင်း**

				• MoNREC • ECD (ဦးစီးရုံးချုပ်) • ECD (မန္တလေး)
စွန့်ပစ်အစိုင်အခဲ ထွက်ရှိမှုနှင့် ဘေးအန္တရာယ်ရှိ စွန့်ပစ်ပစ္စည်းများ	တည်ဆောက်ရေးလုပ်ငန်းမှ စွန့်ပစ်ပစ္စည်းများကို လုပ်သားများထံမှ ထွက်ရှိသည့် စွန့်ပစ်ပစ္စည်းများနှင့် ခွဲခြားထားရမည်။ တည်ဆောက်ရေးလုပ်ငန်းမှ ကြွင်းကျန်ပစ္စည်းများကို သတ်မှတ်ထားသည့် ဧရိယာတွင်သာ စုပုံထားရမည်။ တောင်သမန်အင်းအတွင်းသို့ မည်သည့်စွန့်ပစ်ပစ္စည်းမဆို စွန့်ပစ်ခြင်း မပြုရန် တင်းကြပ်စွာ တားမြစ်ရမည်။ ဆီယိုဖိတ်စင်ပါက အနက်ရောင်အိတ်ဖြင့် သုတ်သင်၍ စနစ်တကျစွန့်ပစ်ရမည်။ စွန့်ပစ်ပစ္စည်းစီမံခန့်ခွဲရာတွင် MCDC နှင့် ပူးပေါင်း ဆောင်ရွက်၍ MCDC ၏ လမ်းညွှန်မှုကို လိုက်နာ ဆောင်ရွက်ရမည်။ လုပ်သားနားနေဆောင်များအတွက် မိလ္လာကန် (Septic tank) များ ဆောင်ရွက်ပေးရမည်။	တောင်သမန်အပန်းဖြေစခန်း တည်ဆောက်ရေးစီမံကိန်း ပရဝုဏ် လုပ်သားယာယီ နားနေဆောင်များ	တည်ဆောက်ရေး ကာလ တလျှောက်လုံး	**အကောင်အထည်ဖော်မှု** • တည်ဆောက်ရေးကာလ EMPIT • သက်ဆိုင်ရာ ဆပ်ကန်ထရိုက်တာများ **ကြီးကြပ်မှု** • MoNREC • ECD (ဦးစီးရုံးချုပ်) • ECD (မန္တလေး) • MCDC • တောင်သမန်သစ္စာ ကုမ္ပဏီလီမိတက် စီမံခန့်ခွဲရေး **အစီရင်ခံတင်ပြခြင်း** • MoNREC • ECD (ဦးစီးရုံးချုပ်) • ECD (မန္တလေး)

	အမှိုက်ပုံးများ အမှိုက်ခြင်းများ လုံလောက်စွာ ထားရှိရပါမည်။ လုပ်သားများထံမှ ထွက်ရှိသည့် စွန့်ပစ်ပစ္စည်းများကို နေ့စဉ်သိမ်းဆည်း၍ နောက်ဆုံးစွန့်ပစ်ခြင်းမပြုမီ သတ်မှတ်နေရာတွင် စုပုံသိမ်းဆည်းထားရမည်။ လုပ်ငန်းခွင်အတွင်း စွန့်ပစ်ပစ္စည်း ယာယီစုပုံမည့်နေရာသည် လူနေအိမ်ခြေများနှင့် အလှမ်းကွာရပါမည်။ MCDC ၏ လမ်းညွှန်ချက်ကိုလိုက်နာ၍ စွန့်ပစ်အစိုင်အခဲများကို စီမံခန့်ခွဲရပါမည်။			
လုပ်ငန်းခွင် ဘေးအန္တရာယ် ကင်းရှင်းရေးနှင့် ကျန်းမာရေး	တစ်ကိုယ်ရည်ကာကွယ်ရေးပစ္စည်းများ လုံလောက်စွာထောက်ပံ့ပေး၍ လုပ်ငန်းခွင်တွင်သေချာစွာ အသုံးပြုကြရန် ကြီးကြပ်ရမည်။ လုပ်ငန်းခွင် ဘေးအန္တရာယ် ကင်းရှင်းရေးနှင့် ကျန်းမာရေးအစီအစဉ်ကို စနစ်တကျ အကောင်အထည်ဖော်ရမည်။ လိုအပ်သော လုပ်ငန်းခွင် ဘေးအန္တရာယ် ကင်းရှင်း ရေးနှင့် ကျန်းမာရေးဆိုင်ရာ သင်တန်းများ အခါအားလျော်စွာ ပို့ချဆောင်ရွက် ရမည်။	တောင်သမန်အပန်းဖြေစခန်း တည်ဆောက်ရေးစီမံကိန်း ပရဝုဏ်	တည်ဆောက်ရေး ကာလ တလျှောက်လုံး	**အကောင်အထည်ဖော်မှု** • တည်ဆောက်ရေးကာလ EMPIT • သက်ဆိုင်ရာ ဆပ်ကန်ထရိုက်တာများ **ကြီးကြပ်မှု** • MoNREC • ECD (ဦးစီးရုံးချုပ်) • ECD (မန္တလေး) • တောင်သမန်သစ္စာ ကုမ္ပဏီလီမိတက် စီမံခန့်ခွဲရေး

				အစီရင်ခံတင်ပြခြင်း • MoNREC • ECD (ဦးစီးရုံးချုပ်) • ECD (မန္တလေး)
စီမံကိန်း အနီး ဒေသစီးပွားရေး	ဒေသခံပြည်သူများကို စီမံကိန်းမှအလုပ်အကိုင် အခွင့်အလမ်းများတွင် ဦးစားပေးခေါ်ယူရပါမည်။ CSR အစီအစဉ်မှတဆင့် ဒေသခံပြည်သူများ၏ အထွေထွေစီးပွားရေးအပေါ်အထောက်အကူ ဖြစ်စေမည့် အစီအစဉ်များ ချမှတ် ဆောင်ရွက်ရမည်။ စီမံကိန်းအတွက် မြေယာများရောင်းချပေးခဲ့သော ဒေသခံမိသားစုများကို စီမံကိန်းမှ အလုပ်အကိုင်အခွင့်အလမ်းများအတွက် အထူးဦးစားပေးရပါမည်။	ဒေသခံလူမှုအသိုက်အဝန်း (တောင်သမန်ကျေးရွာ၊ နွားနို့တော်စုကျေးရွာ၊ ရွာသစ်ကျေးရွာ၊ တဲနန်းသာကျေးရွာ)	စီမံကိန်းလုပ်သားများခေါ်ယူသည့် ကာလ တည်ဆောက်ရေးကာလ တလျှောက်လုံး	**အကောင်အထည်ဖော်မှု** • တည်ဆောက်ရေးကာလ EMPIT • တောင်သမန်သစ္စာကုမ္ပဏီလီမိတက်၏ လူစွမ်းအားရင်းမြစ်ဌာနခွဲ • သက်ဆိုင်ရာ ဆပ်ကန်ထရိုက်တာများ **ကြီးကြပ်မှု** • MoNREC • ECD (ဦးစီးရုံးချုပ်) • ECD (မန္တလေး) • တောင်သမန်သစ္စာကုမ္ပဏီလီမိတက် စီမံခန့်ခွဲရေး **အစီရင်ခံတင်ပြခြင်း** • MoNREC • ECD (ဦးစီးရုံးချုပ်) • ECD (မန္တလေး)

၆.၃၊ လုပ်ငန်းလည်ပတ်ရေးကာလ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် အနှစ်ချုပ်

ပတ်ဝန်းကျင်နှင့် လူမှုရေးဆိုင်ရာ အဓိက ကဏ္ဍများ	စီမံခန့်ခွဲရေးအစီအမံများ	စီမံခန့်ခွဲမည့် နေရာ	စီမံခန့်ခွဲမည့် အချိန်ကာလ	စီမံခန့်ခွဲမည့် အဖွဲ့အစည်း
ရေထုဝန်းကျင်	အပန်းဖြေစခန်းလုပ်ငန်းလည်ပတ်ရာတွင် ဂျိုကာစုရေဆိုးသန့်စင်စနစ် တပ်ဆင်အသုံးပြုပါမည်။ ရေနုတ်မြောင်းစနစ် ပိတ်ဆို့မှုမဖြစ်စေရန် အပတ်စဉ်စစ်ဆေးရပါမည်။ ရေနုတ်မြောင်းများကို လိုအပ်သော အဖုံးများ ဖုံးအုပ်ထားရမည်။ တောင်သမန်အင်းနှင့် အနီးဝန်းကျင်ရှိ ရေအသုံးပြုသူများအပေါ် သက်ရောက်မှုများ လျော့နည်းသက်သာစေသည့်နည်းလမ်းဖြင့် စွန့်ပစ်ရေကို စွန့်ထုတ်ရမည်။ စွန့်ပစ်ရေများကို တောင်သမန်အင်း သို့မဟုတ် နောက်ဆုံးနေရာသို့ စွန့်မထုတ်မီ NEQEG လမ်းညွှန်ချက်များနှင့်အညီ သန့်စင်ရမည်။	အပန်းဖြေစခန်းပရဝုဏ်	လုပ်ငန်းလည်ပတ်ရေး ကာလတလျှောက်လုံး	**အကောင်အထည်ဖော်မှု** • လုပ်ငန်းလည်ပတ်ရေး ကာလ EMPIT **ကြီးကြပ်မှု** • MoNREC • ECD (ဦးစီးရုံးချုပ်) • ECD (မန္တလေး) • MCDC • တောင်သမန်သစ္စာ ကုမ္ပဏီလီမိတက် စီမံခန့်ခွဲရေး **အစီရင်ခံတင်ပြခြင်း** • MoNREC • ECD (ဦးစီးရုံးချုပ်) • ECD (မန္တလေး)

	Sludge များကို MCDC ၏အကူအညီဖြင့် စွန့်ပစ်ရမည်။ အချို့လုပ်ငန်းများမှ ထွက်ရှိလာသော ပြန်လည်အသုံးပြု၍ရသည့် ရေများကို အခြားလုပ်ငန်းများတွင် အသုံးပြုရမည်။ (ဥပမာ - ဥယျာဉ်လုပ်ငန်းနှင့် သန့်ရှင်းရေး) ပိုက်လိုင်းများ ယိုစိမ့်မှု မရှိစေရန် အပတ်စဉ် စစ်ဆေးရမည်။ ရေသုံးစွဲမှုလျှော့ချသည့် အလေ့အကျင့်များ ကျင့်သုံးရမည်။ ရေသုံးစွဲမှုကို လျှော့ချနိုင်မည့် ပိုက်ဆက်ပစ္စည်းများ အသုံးပြုရမည်။			
စွမ်းအင်သုံးစွဲမှု	လက်ရှိသုံးစွဲနေသော ဓာတ်အားဖြန့်ဖြူးရေး စနစ်အပေါ် ထိခိုက်မှုမရှိသော စွမ်းအင်ထောက်ပံ့မှုဒီဇိုင်းကို အသုံးပြုရမည်။ အပန်းဖြေခန်း၏ စွမ်းအင်သုံးစွဲမှုကို တိုင်းတာ ထိန်းချုပ်နိုင်ရန် မီတာတပ်ဆင်ရမည်။	အပန်းဖြေခန်းပရဝုဏ်	လုပ်ငန်းလည်ပတ်ရေး ကာလတလျှောက်လုံး	**အကောင်အထည်ဖော်မှု** • လုပ်ငန်းလည်ပတ်ရေး ကာလ EMPIT • အပန်းဖြေစခန်း M&E အဖွဲ့ **ကြီးကြပ်မှု** • MoNREC • ECD (ဦးစီးရုံးချုပ်) • ECD (မန္တလေး)

	ကောင်းမွန်သော housekeeping အစီအမံများ အကောင်အထည်ဖော် ဆောင်ရွက်ရမည်။ LED မီးသီးများ နှင့်/ သို့မဟုတ် စွမ်းအင်ချွေတာသည့် မီးသီးများ အသုံးပြုရမည်။ စွမ်းအင်သုံးစွဲမှု စစ်ဆေးခြင်းများကို အခါအားလျော်စွာ ဆောင်ရွက်ရမည်။ နေ့အချိန်များတွင် အသုံးပြုခြင်း မရှိသော မီးများကို စစ်ဆေး၍ ပိတ်ထားရမည်။ ညအချိန်များတွင် ရုံးခန်းအလွတ်များမှ မလိုအပ်သောမီးများကို ပိတ်ထားရမည်။ စွမ်းအင်ချွေတာရန်အတွက် စကြံ့များတွင် အာရုံခံကိရိယာများကို တပ်ဆင်ရမည်။ အလှဆင်ရန်အတွက် အသုံးပြုသော ညမီးများကို အချိန်ဇယားဖြင့် ထိန်းချုပ် ဆောင်ရွက်ရမည်။			• MESC • တောင်သမန်သစ္စာ ကုမ္ပဏီလီမိတက် စီမံခန့်ခွဲရေး **အစီရင်ခံတင်ပြခြင်း** • MoNREC • ECD (ဦးစီးရုံးချုပ်) • ECD (မန္တလေး)

ယာဉ်အသွားအလာ	ကျေးရွာအတွင်း လမ်းများအသုံးပြုခြင်းကို ရှောင်ရှားနိုင်ရန် အပန်းဖြေစခန်းအတွက် လမ်းအသစ်ဆောင်ရွက်ရမည်။ အပန်းဖြေစခန်းမှ မော်တော်ယာဉ်များကို ပုံမှန်ထိန်းသိမ်းပြုပြင်ရမည်။ Speed bump များ၊ လူကူးမျဉ်းကျားများ၊ လမ်းအကွေ့များနှင့် အချက်ပြသင်္ကေတများ စသည်တို့အပါအဝင် ယာဉ်ကြောကို အရှိန်လျော့ကျစေသည့် အစီအမံများ ဆောင်ရွက်ရမည်။ စီမံကိန်းလုပ်ငန်းများကြောင့် လမ်းပျက်စီးမှုများ ဖြစ်ပေါ်ပါက ပြန်လည်ပြင်ဆင်ရမည်။ ယာဉ်ရပ်နားရန်နေရာများ လုံလောက်စွာ ဆောင်ရွက်ရမည်။ စီမံကိန်းအတွင်းနှင့် အနီးတွင် ယာဉ်များ သွားလာရန် သင့်တော်သော အရှိန်တစ်ခု	အပန်းဖြေစခန်းပရဝုဏ် အပန်းဖြေစခန်းအနီး လမ်းများ	လုပ်ငန်းလည်ပတ်ရေး ကာလတလျှောက်လုံး	**အကောင်အထည်ဖော်မှု** • လုပ်ငန်းလည်ပတ်ရေး ကာလ EMPIT • အပန်းဖြေစခန်း လုံခြုံရေးအဖွဲ့ **ကြီးကြပ်မှု** • MoNREC • ECD (ဦးစီးရုံးချုပ်) • ECD (မန္တလေး) • တောင်သမန်သစ်စာကုမ္ပဏီလီမိတက် စီမံခန့်ခွဲရေး **အစီရင်ခံတင်ပြခြင်း** • MoNREC • ECD (ဦးစီးရုံးချုပ်) • ECD (မန္တလေး)

	(တစ်နာရီ လျှင် ၁၀ မိုင်နှုန်း) သတ်မှတ် ဆောင်ရွက်ရမည်။ ယာဉ်မတော်တဆမှုများ ဖြစ်ပေါ် ပါက အရေးပေါ်တုန့်ပြန်ရေးအစီအစဉ်ပါအတိုင်း လိုက်နာဆောင်ရွက်ရမည်။			
ယဉ်ကျေးမှုအမွေအနှစ်	စီမံကိန်းအစိတ်အပိုင်းများကို မြန်မာ့ရိုးရာ ယဉ်ကျေးမှုအပေါ်အခြေခံသော ဒီဇိုင်းဖြင့် ဆောင်ရွက်ရမည်။ တောင်သမန်အပန်းဖြေစခန်း စီမံကိန်းအတွက် ယဉ်ကျေးမှုအမွေအနှစ်ဆိုင်ရာ သက်ရောက်မှု သီးခြားဆန်းစစ်ချက်ကို ဆောင်ရွက်ရမည်။ (အစီရင်ခံစာ နောက်ဆက်တွဲတွင် ရှု) မြင်ကွင်းဆိုင်ရာ သက်ရောက်မှုကို လျှော့ချနိုင်ရန် ရှုမြင်ကွင်းနှင့် အပင်များ ပြန်လည်စိုက်ပျိုးခြင်းတို့ ဆောင်ရွက်ရပါမည်။ ရှုခင်းကြည့်စင်္ကြံများကို ပရဝုဏ်အစီအစဉ်နှင့်	အပန်းဖြေစခန်းပရဝုဏ်	လုပ်ငန်းလည်ပတ်ရေး ကာလတလျှောက်လုံး	**အကောင်အထည်ဖော်မှု** • လုပ်ငန်းလည်ပတ်ရေး ကာလ EMPIT • သက်ဆိုင်ရာ ဆပ်ကန်ထရိုက်တာများ **ကြီးကြပ်မှု** • MoNREC • ECD (ဦးစီးရုံးချုပ်) • ECD (မန္တလေး) • MCDC • ရှေးဟောင်းသုတေသနနှင့် အမျိုးသားပြတိုက် ဦးစီးဌာန • တောင်သမန်သစ္စာ ကုမ္ပဏီလီမိတက် စီမံခန့်ခွဲရေး **အစီရင်ခံတင်ပြခြင်း** • MoNREC • ECD (ဦးစီးရုံးချုပ်)

	မြန်မာနိုင်ငံအဆောက်အအုံဆိုင်ရာ စည်းမျဉ်းများနှင့်အညီ ထည့်သွင်းသင့်သည်။ ယဉ်ကျေးမှုအမွေအနှစ်ဝန်းကျင်တွင် မီတာ ၄၀ ထက် မြင့်သော အဆောက်အဦများ တည်ဆောက်ခြင်း မပြုရ ဆိုသော MCDC ၏ ညွှန်ကြားချက်နှင့်အညီ လိုက်နာရမည်။			• ECD (မန္တလေး)
ရှမြင်ကွင်း	အင်းအတွင်း မြေပြိုမှု ကာကွယ်ရန် မြေထိန်းနံရံများ တည်ဆောက်ရမည်။ အင်းအတွင်း စီးဆင်းရေ စီးဆင်းမှုကို ထိန်းချုပ်ရန် စနစ်ကျသော ရေနုတ်မြောင်းဒီဇိုင်းဖြင့် ဆောင်ရွက်ရမည်။ စီမံကိန်းဒီဇိုင်းအတွင်း အစိမ်းရောင် နေရာလွတ်နှင့် ရှမြင်ကွင်းအစိတ်အပိုင်းများ ထည့်သွင်းရမည်။ အစုလိုက်တည်ရှိသော အဆောက်အဦများကို အရောင်တစ်ရောင် ရွေးချယ်သတ်မှတ်၍ ဆေးသုတ်ရမည်။ စီးပွားရေးဆိုင်ရာ ကြော်ငြာသင်္ကေတများ အသုံးပြုခြင်းကို တားမြစ်ရမည်။	အပန်းဖြေစခန်းပရဝုဏ်	လုပ်ငန်းလည်ပတ်ရေး ကာလတလျှောက်လုံး	**အကောင်အထည်ဖော်မှု** • လုပ်ငန်းလည်ပတ်ရေး ကာလ EMPIT **ကြီးကြပ်မှု** • MoNREC • ECD (ဦးစီးရုံးချုပ်) • ECD (မန္တလေး) • တောင်သမန်သစ်စာကုမ္ပဏီလီမိတက် စီမံခန့်ခွဲရေး **အစီရင်ခံတင်ပြခြင်း** • MoNREC • ECD (ဦးစီးရုံးချုပ်) • ECD (မန္တလေး)

	ညအချိန် အလှဆင်မီးအသုံးပြုမှုကို လျှော့ချရမည်။ စကြံ့များတွင် အောက်ဘက်သို့ မျက်နှာမူသော မီးသီးများကို အသုံးပြုရမည်။ ဖျော်ဖြေရေးရည်ရွယ်ချက်အတွက် အသုံးပြုသော ညမီးများကို ဖြစ်နိုင်ပါက မီးမှိန်ထားရမည်။			
စွန့်ပစ်အစိုင်အခဲ ထွက်ရှိမှုနှင့် ဘေးအန္တရာယ်ရှိ စွန့်ပစ်ပစ္စည်းများ	စွန့်ပစ်အစိုင်အခဲ စီမံခန့်ခွဲမှုအစီအစဉ် ရေးဆွဲဆောင်ရွက်ရမည်။ ဝန်ထမ်းများကို ပြန်လည်အသုံးချခြင်းနှင့် ပြန်လည်အသုံးပြုခြင်းဆိုင်ရာ အလေ့အကျင့်များ ကျင့်သုံးရန် အားပေးတိုက်တွန်းရမည်။ အမှိုက်ပုံး၊ အမှိုက်ခြင်းများ လုံလောက်စွာ ထားရှိရမည်။ အမှိုက်ခွဲခြားသိမ်းဆည်းသည့် စနစ်ဖြင့် ကောက်ယူသိမ်းဆည်း၍	အပန်းဖြေစခန်းပရဝုဏ်	လုပ်ငန်းလည်ပတ်ရေး ကာလတလျှောက်လုံး	**အကောင်အထည်ဖော်မှု** • လုပ်ငန်းလည်ပတ်ရေး ကာလ EMPIT **ကြီးကြပ်မှု** • MoNREC • ECD (ဦးစီးရုံးချုပ်) • ECD (မန္တလေး) • MCDC • တောင်သမန်သစ္စာ ကုမ္ပဏီလီမိတက် စီမံခန့်ခွဲရေး **အစီရင်ခံတင်ပြခြင်း**

	နောက်ဆုံးစွန့်ပစ်ခြင်း မပြုမီ သတ်မှတ်အမှိုက်ကန်တွင် စွန့်ပစ်ရမည်။ အမှိုက်ကန်များကို လူနေအိမ်ခြေများနှင့် အလှမ်းဝေးသော နေရာများတွင် ထားရှိရမည်။ တောင်သမန်အင်းအတွင်းသို့ စွန့်ပစ်ပစ္စည်းများ စွန့်ပစ်ခြင်းကို တင်းကျပ်စွာ တားမြစ်ရမည်။ ဘေးအန္တရာယ်ရှိ စွန့်ပစ်ပစ္စည်းများကို ခွဲခြားသိမ်းဆည်းစွန့်ပစ်ရမည်။ ဘေးအန္တရာယ်ရှိ စွန့်ပစ်ပစ္စည်းများကို MCDC ၏ လမ်းညွှန်မှုဖြင့် စီမံခန့်ခွဲရမည်။			• MoNREC • ECD (ဦးစီးရုံးချုပ်) • ECD (မန္တလေး)
မီးဘေးအန္တရာယ်	မီးဖိုချောင်အတွင်းတွင် ဖြစ်နိုင်သော မီးဘေးအန္တရာယ်များနှင့် စပ်လျဉ်း၍ မီးဖိုချောင်နှင့် ဆက်စပ်ဝန်ထမ်းများအနေဖြင့် သိရှိနားလည်ထားပြီး သေချာစွာလေ့ကျင့်ထားရမည်။	အပန်းဖြေစခန်းပရဝုဏ်	လုပ်ငန်းလည်ပတ်ရေးကာလတလျှောက်လုံး	**အကောင်အထည်ဖော်မှု** • လုပ်ငန်းလည်ပတ်ရေးကာလ EMPIT **ကြီးကြပ်မှု** • MoNREC • ECD (ဦးစီးရုံးချုပ်) • ECD (မန္တလေး) • မြို့နယ်မီးသတ်တပ်ဖွဲ့

	မှန်ကန်သော မီးသတ်ဆေးဘူးအမျိုးအစား ကို အလွယ်တကူအသုံးပြုနိုင်ရန် ထားရှိရမည်။ ဝန်ထမ်းများလည်း အသုံးပြုတတ်ရန် လေ့ကျင့်သင်ကြားထားရမည်။ ဆီများ၊ မျက်နှာသုတ်ပဝါများနှင့် စက္ကူထုတ်ကုန်များကဲ့သို့ မီးလောင်လွယ်သောပစ္စည်းများ သိုလှောင်ခြင်းကို သတိထားရမည် - ၎င်းတို့ကို မီးလောင်ကျွမ်းမှု ဒဏ်ခံနိုင်သည့်နေရာများ အနီးတွင် သိမ်းဆည်းခြင်းမပြုရ။ ဧည့်သည်တစ်ဦးသည် စည်းကမ်းများကို ဖောက်ဖျက်ပြီး မီးလောင်မှုဖြစ်ပွားပါက၊ မီးခိုးအာရုံခံကိရိယာများသည် လျင်မြန်သောတုံ့ပြန်မှုနှင့် ဘေးကင်းရာသို့ ပြောင်းရွှေ့ရန် ကူညီပေးပါမည်။ အပြင်ဘက်တွင် ရှင်းရှင်းလင်းလင်း၊ ကျယ်ဝန်းသော ဆေးလိပ်သောက်သည့် နေရာများကို သတ်မှတ်ကာ စီးကရက်များကို လွယ်ကူလုံခြုံစွာ			• တောင်သမန်သစ္စာ ကုမ္ပဏီလီမိတက် စီမံခန့်ခွဲရေး **အစီရင်ခံတင်ပြခြင်း** • MoNREC • ECD (ဦးစီးရုံးချုပ်) • ECD (မန္တလေး)

	စွန့်ပစ်ရန်အတွက် စီးကရက်စွန့်ပစ်ရန် ပုံးများအနီးတွင် ထားရှိရမည်။ ထွက်ပေါက်လမ်းကြောင်းများကို အချိန်တိုင်းရှင်းလင်းနေစေရမည်။ အမှိုက်နှင့် အခြားပစ္စည်းများ သိုလှောင်ရန်အတွက် ဘေးကင်းသော ဧရိယာများကို သတ်မှတ်ကာ ၎င်းတို့ကို ပုံမှန်စစ်ဆေးရမည် - အမှိုက်ပုံးများကို ပုံမှန် စွန့်ပစ်ရမည်။ မီးလောင်မှု ဖြစ်ပွားပါက အရေးပေါ် အခြေအနေတုန့်ပြန်ရေး အစီအစဉ်အတိုင်း လိုက်နာဆောင်ရွက်ရမည်။			
စီမံကိန်း အနီး ဒေသစီးပွားရေး	ဒေသခံပြည်သူများကို စီမံကိန်းမှ အလုပ်အကိုင်အခွင့်အလမ်းများတွင် ဦးစားပေးခေါ်ယူရပါမည်။ CSR အစီအစဉ်မှတဆင့် ဒေသခံ ပြည်သူများ၏ အထွေထွေစီးပွားရေး အပေါ်အထောက်အကူ ဖြစ်စေမည့် အစီအစဉ်များချမှတ် ဆောင်ရွက်ရမည်။	ဒေသခံလူမှုအသိုက်အဝန်း (တောင်သမန်ကျေးရွာ၊ နွားနို့တော်စုကျေးရွာ၊ ရွာသစ်ကျေးရွာ၊ တဲနန်းသာကျေးရွာ)	အပန်းဖြေစခန်း လုပ်သားများ ခေါ်ယူသည့် ကာလ လုပ်ငန်းလည်ပတ်ရေး ကာလတလျှောက်လုံး	**အကောင်အထည်ဖော်မှု** • လုပ်ငန်းလည်ပတ်ရေး ကာလ EMPIT • တောင်သမန်သစ္စာ ကုမ္ပဏီလီမိတက်၏ လူ့စွမ်းအားရင်းမြစ်ဌာနခွဲ • သက်ဆိုင်ရာ ဆပ်ကန်ထရိုက်တာများ **ကြီးကြပ်မှု**

	စီမံကိန်းအတွက် မြေယာများ ရောင်းချပေးခဲ့သော ဒေသခံမိသားစုများကို စီမံကိန်းမှ အလုပ်အကိုင်အခွင့်အလမ်းများ အတွက် အထူးဦးစားပေးရပါမည်။ ခရီးသွားလုပ်ငန်းနှင့်ဆက်စပ် စီးပွားရေး လုပ်ငန်းများမှ ဒေသခံပြည်သူများသည် ဝင်ငွေများဖန်တီးရရှိနိုင်စေရန် စီမံကိန်းမှ ထောက်ပံ့ကူညီဆောင်ရွက်ပေးရမည်။			• MoNREC • ECD (ဦးစီးရုံးချုပ်) • ECD (မန္တလေး) • တောင်သမန်သစ္စာ ကုမ္ပဏီလီမိတက် စီမံခန့်ခွဲရေး **အစီရင်ခံတင်ပြခြင်း** • MoNREC • ECD (ဦးစီးရုံးချုပ်) • ECD (မန္တလေး)

၆.၄၊ ပတ်ဝန်းကျင် စောင့်ကြပ်ကြည့်ရှုမှုအစီအစဉ်

ပုံမှန်လုပ်ငန်းများ ဆောင်ရွက်နေစဉ်နှင့် ထူးခြားဖြစ်စဉ်အခြေအနေများအတွင်း ပတ်ဝန်းကျင်အပေါ် သိသာထင်ရှားသော သက်ရောက်မှုများ ရှိနိုင်သည်ဟု ဖော်ထုတ်တွေ့ရှိထားသည့် စီမံကိန်းလုပ်ငန်းများအားလုံးကို ကိုင်တွယ်ဖြေရှင်းရန်အတွက် ပတ်ဝန်းကျင်စောင့်ကြပ်ကြည့်ရှုမှု အစီအစဉ် များကို အကောင်အထည်ဖော် ဆောင်ရွက်ရမည်ဖြစ်သည်။ ပတ်ဝန်းကျင်စောင့်ကြပ်ကြည့်ရှုမှုလုပ်ငန်းများသည် စီမံကိန်းနှင့် သီးသန့်သက်ဆိုင်သော ထုတ်လွှတ်မှု၊ စွန့်ပစ်ပစ္စည်းများနှင့် အရင်းအမြစ် အသုံးပြုမှုတို့၏ တိုက်ရိုက် သို့မဟုတ် သွယ်ဝိုက်သွန်းကိန်းများအပေါ် အခြေခံသင့်သည်။ အောက်ဖော်ပြပါ ဇယားသည် တောင်သမန်အပန်းဖြေစခန်း စီမံကိန်းအတွက် အဆိုပြုပတ်ဝန်းကျင်စောင့်ကြပ် ကြည့်ရှုမှုအစီအစဉ်ဖြစ်သည်။

တည်ဆောက်ရေးကာလ ပတ်ဝန်းကျင်စောင့်ကြပ်ကြည့်ရှုမှုအစီအစဉ်

နယ်ပယ်	ပါရာမီတာများ	တည်နေရာ	ကြိမ်ရေ	ဆောင်ရွက်ရမည့် အဖွဲ့အစည်း
လေထု	NO_2, SO_2, PM_{10}, $PM_{2.5}$, O_3, CO	စီမံကိန်း၏ ဆောက်လုပ်ရေး လုပ်ငန်းခွင် အနီး (21° 53’ 5.83” N, 96° 03’ 50.36” E)	၆ လ တစ်ကြိမ်	စီမံကိန်းအဆိုပြုသူ
မြေအောက်ရေ အရည်အသွေး	Total Coliforms, Fecal Coliforms, Color, Turbidity, Arsenic, Lead, Nitrate, Manganese, Chloride, Hardness, Iron, pH, Sulphate, Total Dissolved Solids	စီမံကိန်းရေိယာ ရှိ မြေအောက်ရေ 21° 53’ 16.98” N 96° 03’ 46.4” E	တစ်နှစ် တစ်ကြိမ်	စီမံကိန်းအဆိုပြုသူ
စွန့်ပစ်ရေအရည် အသွေး	BOD, COD, Oil and Grease, pH, Total Coliform Bacteria, Total Nitrogen, Total Phosphorus, Total Suspended Solids	ရေဆိုးသန့်စင်ကန်မှ နောက်ဆုံးထွက်ရှိသည့် စွန့်ပစ်ရေ (21° 53’ 7.12” N , 96° 03’ 44.08” E)	၃ လ တစ်ကြိမ်	စီမံကိန်းအဆိုပြုသူ
စွန့်ပစ်ပစ္စည်း	ဆောက်လုပ်ရေးလုပငန်းခွင်မှ ထွက်ရှိသည့် စွန့်ပစ်ပစ္စည်းနှင့် ပမာဏ	စွန့်ပစ်ပစ္စည်းထွက်ရှိသည့် နေရာများ	လစဉ်	စီမံကိန်းအဆိုပြုသူ

ဆူညံသံနှင့် တုန်ခါမှု	dBA and Vibraion meter	စီမံကိန်း၏ ဆောက်လုပ်ရေး လုပ်ငန်းခွင် အနီး. (21° 53’ 5.83” N, 96° 03’ 50.36” E)	Once per year	စီမံကိန်းအဆိုပြု သူ
လုပ်ငန်းခွင် ကျန်းမာရေး နှင့် ဘေးအန္တရာယ် ကင်းရှင်းရေး	ရောဂါဖြစ်ပွားမှုနှင့် ထိခိုက်မှု မှတ်တမ်းတင်ရန်	ဆောက်လုပ်ရေး လုပ်ငန်းခွင်နှင့် အုပ်ချုပ်မှုရုံး	လစဉ်	စီမံကိန်းအဆိုပြု သူ
အနီးဝန်းကျင် ကျန်းမာရေးနှင့် ဘေးအန္တရာယ် ကင်းရှင်းရေး	စီမံကိန်းလုပ်ငန်းကြောင့် ဖြစ်ပေါ် ခဲ့သော ဘေးအန္တရာယ်ထိခိုက်မှုနှင့် ရောဂါဖြစ်ပွားမှု မှတ်တမ်းတင်ရန်	စီမံကိန်းအနီး ဝန်းကျင်	လစဉ်	စီမံကိန်းအဆိုပြု သူ

လုပ်ငန်းလည်ပတ်စဉ်ကာလ ပတ်ဝန်းကျင်စောင့်ကြပ်ကြည့်ရှုမှုအစီအစဉ်

Category	Item	Location	Frequency	Resposible Organization
လေထု	NO_2, SO_2, PM_{10}, $PM_{2.5}$, O_3, CO	စီမံကိန်း၏ အုပ်ချုပ်မှု ရုံးအနီးဝန်းကျင် (21° 53’ 15.93” N 96° 03’ 45.08” E)	တစ်နှစ် တစ်ကြိမ်	စီမံကိန်းအဆိုပြု သူ

Category	Item	Location	Frequency	Resposible Organization
မြေအောက်ရေ အရည်အသွေး	Total Coliforms, Fecal Coliforms, Color, Turbidity, Arsenic, Lead, Nitrate, Manganese, Chloride, Hardness, Iron, pH, Sulphate, Total Dissolved Solids	စီမံကိန်းဧရိယာ ရှိ မြေအောက်ရေ 21° 53’ 16.98” N 96° 03’ 46.4” E	၆ လ တစ်ကြိမ်	စီမံကိန်းအဆိုပြု သူ
နောက်ဆုံးစွန့်ပစ် ရေ	BOD, COD, Oil and Grease, pH, Total Coliform Bacteria, Total Nitrogen, Total Phosphorus, Total Suspended Solids	ရေဆိုးသန့်စင်ကန်မှ နောက်ဆုံးထွက်ရှိသည့် စွန့်ပစ်ရေ (21° 53’ 7.12” N , 96° 03’ 44.08” E)	၃ လ တစ်ကြိမ်	စီမံကိန်းအဆိုပြု သူ
မြေပေါ်ရေ အရည်အသွေး	BOD, COD, Oil and Grease, pH, Total Coliform Bacteria, Total Nitrogen, Total Phosphorus, Total Suspended Solids	စီမံကိန်းမှ ထုတ်လွှတ်သည့် နောက်ဆုံး စွန့်ပစ်ရေ ထွက်ရှိသည့် အနီး (21° 53’ 7.12” N , 96° 03’ 44.08” E)	၆ လ တစ်ကြိမ်	စီမံကိန်းအဆိုပြု သူ
စွန့်ပစ်ပစ္စည်း	စီမံကိန်းတစ်ခု လုံးမှ ထွက်ရှိသည့် စွန့်ပစ်ပစ္စည်းနှင့် ပမာဏ	စွန့်ပစ်ပစ္စည်းထွက်ရှိ သည့် နေရာများ	လစဉ်	စီမံကိန်းအဆိုပြု သူ

Category	Item	Location	Frequency	Resposible Organization
ဆူညံသံနှင့် တုန်ခါမှု	dBA and Vibraion meter	စီမံကိန်း၏ အုပ်ချုပ်မှု ရုံးအနီးဝန်းကျင် (21° 53’ 15.93” N 96° 03’ 45.08” E)	တစ်နှစ် တစ်ကြိမ်	စီမံကိန်းအဆိုပြုသူ
Occupational Health and Safery	ရောဂါဖြစ်ပွားမှုနှင့် ထိခိုက်မှု မှတ်တမ်းတင်ရန်	စီမံကိန်း ဧရိယာ တစ်ခုလုံး	လစဉ်	စီမံကိန်းအဆိုပြုသူ
လေ့ကျင့်မှုနှင့် ကျွမ်းကျင်မှု ဖွံ့ဖြိုးရေး	ရပ်ရွာနှင့် စီမံကိန်းရှိ လူငယ်များအတွက် ဖွံ့ဖြိုးတိုးတက်ရေး အစီအစဉ်မများ.	စီမံကိန်းနှင့် စီမံကိန်းအနီး ဝန်းကျင်	တစ်နှစ် တစ်ကြိမ်	စီမံကိန်းအဆိုပြုသူ
မီးဘေးလုံခြုံရေးနှင့် အရေးပေါ်	မီးသတ်ဆေးဗူးများနှင့် ၎င်းတို့၏ သုံးစွဲမှု၊ အရေးပေါ်ထွက်ပေါက် ပြမီးများ၊ အရေးပေါ် ထွက်ပေါက်များ၊ မီးဘေးလုံခြုံရေး ကိရိယာများ ပြုပြင်ထိန်းသိမ်းထား	စီမံကိန်း၏ အဆောက် အအုံနေရာတိုင်း	လစဉ်	စီမံကိန်းအဆိုပြုသူ

Category	Item	Location	Frequency	Resposible Organization
	မှု စစ်ဆေးခြင်း မှတ်တမ်း၊			
မကျေလည်မှုများ ဖြေရှင်းရေး	တိုင်ကြားမှု မှတ်တမ်း များနှင့် တုံ့ပြန်ဖြေရှင်းမှု မှတ်တမ်းများ	တိုင်ကြားမှု လက်ခံသည့် နေရာ	လစဉ်	စီမံကိန်းအဆိုပြု သူ

စောင့်ကြပ်ကြည့်ရှုခြင်းလုပ်ငန်းစဉ်အတွက် ရန်ပုံငွေလျာထားချက်

No.	Item	Budget (USD) per year	
		During Construction	During Operation
1.	လေထုအရည်အသွေးတိုင်းတာမှု	1,200/	700/
2.	ရေအရည်အသွေး (မြေအောက်ရေ၊ စွန့်ပစ်ရေနှင့် မြေပေါ်ရေ)	600/	1,000/
3.	စွန့်ပစ်ပစ္စည်း	500/	1,500/
4.	ဆူညံသံနှင့် တုန်ခါမှု	300	300/
5.	လုပ်ငန်းခွင် ဘေးအန္တရာယ်ကင်းရှင်းရေး နှင့် ကျန်းမာရေး	3,000/	1,000/
6.	စီမံကိန်းအနီးဝန်းကျင် ဘေးအန္တရာယ် ကင်းရှင်းရေးနှင့် ကျန်းမာရေး	1,500/	1,000/
7.	မီးဘေးလုံခြုံရေးနှင့် အရေးပေါ် ကြိုတင် ပြင်ဆင်ခြင်း	1,000/	600/
8.	လေ့ကျင့်မှုနှင့် ကျွမ်းကျင်မှု ဖွံ့ဖြိုးရေး	2,000/	2,000/

၆.၅၊ အစီအစဉ်ခွဲများ

၆.၅.၁၊ လုပ်ငန်းခွင် ဘေးအန္တရာယ်ကင်းရှင်းရေးနှင့် ကျန်းမာရေးအစီအစဉ်

လုပ်ငန်းခွင်ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေးပြဿနာများသည် စီမံကိန်းတည်ဆောက်ရေးနှင့် ဆက်စပ်နေပါသည်။ စီမံကိန်းအဆိုပြုသူနှင့် ၎င်း၏ ဆောက်လုပ်ရေး

ကန်ထရိုက်တာသည် အလုပ်သမားများ၏ ကျန်းမာရေးနှင့် ဘေးကင်းရေးကို ကာကွယ်ရန်အတွက် သင့်လျော်သော ကြိုတင်ကာကွယ်မှုအစီအမံများကို အကောင်အထည်ဖော်ရန် တာဝန်ရှိသည်။ ဤအစီအစဉ်သည် လုပ်ငန်းခွင်ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေးဆိုင်ရာ အဓိက အန္တရာယ်များကို စီမံခန့်ခွဲရာတွင် သင့်လျော်သော ကြိုတင်ကာကွယ်မှုအစီအမံ ဥပမာများနှင့် လမ်းညွှန်ချက်များကို ဖော်ပြထားပါသည်။ ဤအစီအစဉ်သည် စီမံကိန်း၏ တည်ဆောက်ရေးနှင့် ပိတ်သိမ်းရေး လုပ်ငန်းများအတွက် အဓိကရည်ရွယ်ထားခြင်းဖြစ်ပါသည်။ အသေးစိတ်အစီအစဉ်ကို ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း အစီရင်ခံစာ၏ နောက်ဆက်တွဲတွင် ဖော်ပြထားသည်။

၆.၅.၂ အရေးပေါ်အခြေအနေတုန့်ပြန်ရေးအစီအစဉ်

ဤအစီအစဉ်၏ ရည်ရွယ်ချက်မှာ ဖြစ်နိုင်ခြေရှိသော သဘာဝနှင့် လူလုပ် အရေးပေါ် အခြေအနေများနှင့် ဆက်စပ်၍ တောင်သမန်အပန်းဖြေစခန်း၏ ကြိုတင်ပြင်ဆင်မှုနှင့် တုံ့ပြန် ဆောင်ရွက်မှုအစီအမံများကို သတ်မှတ်ဖော်ပြရန်ဖြစ်ပါသည်။ တောင်သမန်အပန်းဖြေစခန်း၏ စီမံခန့်ခွဲမှုအဆင့်တိုင်း၊ ဝန်ထမ်းများနှင့် ဧည့်သည်များသည် မတော်တဆမှုများကြောင့်ဖြစ်ရသည့် အန္တရာယ်များနှင့် ပျက်စီးဆုံးရှုံးမှုများကို လျှော့ချရန်အတွက် အရေးပေါ်အခြေအနေများကို ဖြစ်ပေါ် လာပါက မည်ကဲ့သို့ဆောင်ရွက်ရမည်ကို တိကျသေချာသောနည်းလမ်းများလည်း သတ်မှတ်ထားပြီး ဖြစ်ပါသည်။ အသေးစိတ်အစီအစဉ်ကို ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း အစီရင်ခံစာ၏ နောက်ဆက်တွဲတွင် ဖော်ပြထားသည်။

၆.၅.၃၊ နစ်နာမှုဖြေရှင်းရေးယန္တရား

နစ်နာမှုဆိုသည်မှာ ကုမ္ပဏီ၏လုပ်ငန်းဆောင်ရွက်မှုကြောင့် ထိခိုက်ခံစားရသော လူမှုအသိုင်းအဝိုင်း အတွင်းရှိ လူတစ်ဦးတစ်ယောက် သို့မဟုတ် အုပ်စုတစ်ခုမှ ထွက်ပေါ်လာသော စိုးရိမ်ပူပန်မှု သို့မဟုတ် တိုင်ကြားချက်ဖြစ်သည်။ တောင်သမန်အပန်းဖြေစခန်းအတွက် ထိခိုက်ခံစားရသူများသည် ကုမ္ပဏီ၏ ဝန်ထမ်းများ၊ ထိခိုက်ခံစားရသော အသိုင်းအဝန်းများ သို့မဟုတ် အပန်းဖြေစခန်းသို့ လာရောက်လည်ပတ်သူ များပင် ဖြစ်နိုင်ပါသည်။ ကုမ္ပဏီသည် ရပ်ရွာလူထု၏ အကြံပြုချက်များကို တုံ့ပြန်ရန်အတွက် သတင်း အချက်အလက်ထုတ်ဖော်ခြင်း၊ တိုင်ပင်ဆွေးနွေးခြင်းနှင့် စီမံကိန်းစောင့်ကြပ်ကြည့်ရှုမှုစနစ်တွင် ပါဝင်ရန် ဖိတ်ကြားခြင်းကဲ့သို့သော သက်ဆိုင်ရာ လမ်းကြောင်းများမှတစ်ဆင့် ကောင်းမွန်သော အလေ့အကျင့်များကို ဆောင်ရွက်မည်ဖြစ်ပါသည်။ အသေးစိတ်အစီအစဉ်ကို ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာ၏ နောက်ဆက်တွဲတွင် ဖော်ပြထားသည်။

၇။ အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်းနှင့် သတင်းအချက်အလက်ထုတ်ဖော်တင်ပြခြင်း

၇.၁၊ ပထမအကြိမ် အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်း

စီမံကိန်းဆိုင်ရာ သတင်းအချက်အလက်များ ထုတ်ပြန်ရန်နှင့် စီမံကိန်းနှင့်ပတ်သက်သည့် အများပြည်သူ၏ သဘောထားမှတ်ချက်များနှင့် အကြံပြုချက်များကို တောင်းခံရန်အတွက် ပထမ

အကြိမ် လူထုတွေ့ဆုံပွဲကို ၂၀၁၅ ခုနှစ် မေလ ၂၃ ရက်နေ့တွင် ရွာသစ်ကျေးရွာ၌ ပြုလုပ်ခဲ့သည်။ အဆိုပါ လူထုတွေ့ဆုံပွဲသို့ ဒေသခံလူထု၊ စီမံကိန်းမှ ကိုယ်စားလှယ်များနှင့် OSHE ကုမ္ပဏီမှ ကိုယ်စားလှယ်များအပါအဝင် စုစုပေါင်း ၈၈ ဦးခန့် တက်ရောက်ခဲ့ကြပြီး ပွင့်ပွင့်လင်းလင်း ဆွေးနွေးခဲ့ကြပါသည်။

အစည်းအဝေးတွင် ဒေသခံပြည်သူများ၏ ဆွေးနွေးချက်အကျဉ်းချုပ်မှာ အောက်ပါအတိုင်း ဖြစ်ပါသည်-

1. ကျေးရွာကိုယ်ထူကိုယ်ထလမ်းပေါ်တွင် ကားကြီးများ ဖြတ်သန်းသွားလာနေပါသဖြင့် လမ်းများ ပျက်စီးမည်ဖြစ်သောကြောင့် ကုမ္ပဏီမှ မည်သို့တာဝန်ယူမည်ကို သိလိုပါကြောင်း။
2. နွားနို့တော်စုနှင့် တောင်သမန်ကြားလမ်းကို ပြုပြင်ပေးစေလိုပါကြောင်း။
3. ဒေသခံများ အမှိုက်စွန့်ပစ်မှုကို စနစ်တကျ ဖြစ်လာစေရေးအတွက် စီမံကိန်းမှ ကူညီပေးစေလိုပါကြောင်း။
4. ယာဉ်အန္တရာယ်ကင်းရှင်းရေးလုပ်ငန်းများ ဆောင်ရွက်ပေးစေလိုပါကြောင်း။
5. မော်တော်ယာဉ်ကြီးများကြောင့် ဖုန်နှင့် အမှုန်အမွှားလွင့်ပျံ့မှု နည်းပါးအောင် ဆောင်ရွက်ပေးစေလိုပါကြောင်း။
6. စီမံကိန်းလုပ်ငန်းများ ဆောင်ရွက်ရာတွင် ရွာလမ်းများမပျက်စီးစေရေး ထည့်သွင်းစဉ်းစားစေလိုပါကြောင်း။
7. စီမံကိန်းက အနီးအပါးကျေးရွာများကို မည်သို့ ကူညီထောက်ပံ့ပေးမည်ကို သိရှိလိုပါကြောင်း။

စီမံကိန်းမှ တာဝန်ရှိသူတစ်ဦးကပြန်လည်ရှင်းလင်းဆွေးနွေးရာတွင်-

1. ဝန်နှင့်အားမမျှသည့်အတွက် ရေရှည်တွင် လမ်းများပျက်စီးနိုင်ပါကြောင်း။
2. ကုမ္ပဏီအနေဖြင့် ရွာလမ်းများကို အဆင့်မြှင့်တင် ပြုပြင်ပေးသွားမည် ဖြစ်ပါကြောင်း။
3. ထိုသို့ပြုပြင်မှုများပြုလုပ်သည့်အခါတိုင်းတွင် ဒေသခံများနှင့် ဦးစွာတိုင်ပင်ညှိနှိုင်းသွားမည်ဖြစ်ပါကြောင်း။
4. အမှိုက်စွန့်ပစ်မှုများ စနစ်ကျနစေရေးအတွက် စီမံကိန်းမပြီးမီ စည်ပင်နှင့် တိုင်ပင်ညှိနှိုင်းပြီး လုပ်ဆောင်ပေးမည် ဖြစ်ပါကြောင်း။
5. စီမံကိန်းအနေဖြင့်လည်း အမှိုက်စွန့်ပစ်စနစ်ကို စနစ်တကျဆောင်ရွက်သွားမည်ဖြစ်ပါကြောင်း။
6. မော်တော်ယာဉ်များကို အရှိန်နှုန်းထိန်းသိမ်းရန် လုပ်ဆောင်ပေးမည် ဖြစ်ပါကြောင်း။

7. မီးကိစ္စ၊ လမ်းပိုင်းဆိုင်ရာလိုအပ်ချက်များ အပါအဝင် အနီးအပါး ရွာအားလုံး အတွက် ပါဝင်ကူညီ ဆောင်ရွက်ပေးသွားမည်ဖြစ်ပါကြောင်း။
8. ဖုန်နှင့် အမှုန်အမွှားလွင့်ပျံမှုကို လေ့လာပြီး စဉ်းစားဆောင်ရွက်သွားမည် ဖြစ်ပါကြောင်း။
9. အဖွဲ့တစ်ဖွဲ့သီးသန့်ဖွဲ့စည်းပြီး ရပ်ရွာဖွံ့ဖြိုးတိုးတက်ရေး ဆောင်ရွက်မည် ဖြစ်ပါကြောင်း။

၇.၂ ဒုတိယအကြိမ် အများပြည်သူနှင့် တိုင်ပင်ဆွေးနွေးခြင်း

စီမံကိန်းဆိုင်ရာ သတင်းအချက်အလက်များ ထုတ်ပြန်ရန်နှင့် စီမံကိန်းနှင့်ပတ်သက်သည့် အများပြည်သူ၏ သဘောထားမှတ်ချက်များနှင့် အကြံပြုချက်များကို တောင်းခံရန်အတွက် ဒုတိယအကြိမ် လူထုတွေ့ဆုံပွဲကို ၂၀၁၅ ခုနှစ် စက်တင်ဘာလ ၂၀ ရက်နေ့တွင် ရွာသစ်ကျေးရွာ၌ ထပ်မံပြုလုပ်ခဲ့သည်။ အဆိုပါ လူထုတွေ့ဆုံပွဲသို့ ဒေသခံလူထု၊ စီမံကိန်းမှ ကိုယ်စားလှယ်များနှင့် OSHE ကုမ္ပဏီမှ ကိုယ်စားလှယ်များအပါအဝင် စုစုပေါင်း ၁၇၃ ဦးခန့် တက်ရောက်ခဲ့ကြပြီး ပွင့်ပွင့်လင်းလင်း ဆွေးနွေးခဲ့ကြပါသည်။

ဒုတိယအကြိမ်အစည်းအဝေး ဆွေးနွေးချက်အကျဉ်းချုပ်မှာ-

1. တောင်သမန်ကျေးရွာနေပြည်သူများ အသုံးပြုသည့် ရေတွင်းနှစ်တွင်းသို့ လမ်း ဖောက်လုပ်ပေးစေလိုပါကြောင်း။
2. စီမံကိန်းမှ တည်ဆောက်ထားတဲ့ မြေသားတံတိုင်းကို ဖြတ်၍ လမ်းဖောက်ပေးစေ လိုပါကြောင်း။
3. စီမံကိန်းမှ ဖောက်လုပ်ထားသောလမ်းသည် လက်ရှိတွင် အနည်းငယ်ပါးလွာ သောကြောင့် ထပ်ပိုးအလွှာခင်းပေးစေလိုပါကြောင်း။
4. အမြန်လမ်းနှင့် လမ်းဆုံတွင် လမ်းခင်းပေးစေလိုပါကြောင်း။
5. ကလေးသူငယ်များ ယာဉ်အန္တရာယ်ဘေးကင်းရေးအတွက် ပေါ့လျော့မှုရှိသော ယာဉ်မောင်းများအား ကြီးကြပ်စေလိုပါကြောင်း။
6. ဖုန်မှုန့်နှင့် အမှုန်အမွှားများထိန်းချုပ်ရေးအစီအမံများဖြစ်သည့် ထရပ်ကားများကို အဖုံးအကာအုပ်မိုးခြင်းနှင့် လမ်းကို ရေဖြန်းသည့်အစီအမံများ ဆောင်ရွက်ပေးစေ လိုပါကြောင်း။
7. စီမံကိန်းမှ လမ်းများပျက်စီးခြင်းကို ဂရုမစိုက်သောကြောင့် ကျေးရွာလမ်းများ အသုံးပြုခြင်းမပြုရန် တားမြစ်စေလိုပါကြောင်း။

EXECUTIVE SUMMARY

1. Project Background

Taung Thaman Thitsar Company Limited (TTMTS) is trying to implement Myanmar traditional culture and Taung Thaman Rural Tourist Resort Services at Taung Tha Man Village. The project will be implemented on 40.27 acres of granted land and the project location is U Paing no. 99, 100, 103/2. 104, 105, 134/1, 135, 138/1, 138/2, 139, 150/2, 152/1, 152/2, 153/1, Taung Thaman plot no. (592), Taung Thaman villagetract, Amarapura Township, Mandalay District, Mandalay Region. The project includes inner – roads, shop houses, low-rise commercial buildings, hotels, banquet halls and a conference center, parks, playground, court yard, bank, shopping mall, tourism service center, and sales office.

The project investment was approved by the Myanmar Investment Commission (MIC) permit No. 072/ 2018 issued on 27th March, 2018. The project occupies an area of about 40.27 acres. The project will operate under the supervision of Taung Thaman Thitsar Co., Ltd which is a hundred percent local investment.

In compliance with the Environmental Conservation Law (2012), Environmental Conservation Rules (2014) and Environmental Impact Assessment Procedures (2015), Environmental and Social Impact Assessment (ESIA) study was conducted by OSHE Services Co., Ltd. The scoping report and Terms Of References of the project ESIA study was also conducted by OSHE Services Co., Ltd. and approved by the Director Office, Mandalay Region Environmental Conservation Department on 3rd May, 2022 with the letter No. 2/6/7 EIA (274/2022) referring to the approval letter (Letter No. EIA-1/3/AhTiPyu(SR)603/2022 from Environmental Conservation Department, Naypyitaw dated on 7th April, 2022.

1.1 Objectives of ESIA Study

ESIA study for Taung Thaman Resort Project is performed by OSHE with the following specific objectives:

I. To investigate the legality of the project;
II. To study the background environmental and socioeconomic profile of the area;
III. To release project related information for the general public;
IV. To study the environmental, social and socioeconomic issues likely to occur; and
V. To devise mitigation and enhancement measures for key environmental and social impacts.

1.2 ESIA Study Team

This is the brief information of OSHE Services Co., Ltd. that conducted ESIA study of Taung Thaman Thitsar Resort. More detailed information of study team is described in the EIA report.

Table A. Information of Third Party Consultant

Company name	**OSHE Services Co., Ltd.**
Type of business	Environmental Consulting services
MoNREC Transitional Consultant Registration (TCR) Number	018
Responsibility	Overall management, technical aspect of ESIA study, and public consultation and disclosure
Contact details	Address – No. 92, Kant Kaw Myaing Lane (2), Ward (33), North Dagon Township, Yangon, Myanmar. Phone – +95 9401600255 Email – sm260859new@gmail.com

2. Policy, Legal and Institutional Framework

The project proponent will follow the existing laws and regulations of the Republic of the Union Myanmar and will develop the project in accordance with them. The following table is the overview of project related laws;

- The Environmental Conservation Law (2012)
- The Environmental Conservation Rules (2014)
- The Environmental Impact Assessment Procedures (2015)
- National Environmental Quality (Emission) Guidelines (2015)
- The Myanmar Tourism Law (2018)
- Myanmar Investment Law (2016)
- Myanmar Investment Rule (2017)
- The Myanmar Insurance Law (1993)
- The Petroleum and Petroleum Product Law (2017)
- The Explosive Substances Act (1908)
- The Industrial Explosive Materials Law (2018)
- The Vehicle Safety and Motor Vehicle Management Law (2020)
- The Vehicle Safety and Motor Vehicle Management rules (2022)
- Automobile Law (2015)
- Ehnic Rights Protection Law (2015)
- The Ethnic Rights Protection Rules (2015)

- The Prevention and Control of Communicable Diseases Law (1995_Amending 2011)
- The Control of Smoking and Consumption of Tobacco Product Law (2006)
- The Employment and Skill Development Law (2013)
- The Settlement of Labour Dispute Law (2012)
- The Leave and Holiday Act 1951 (Amended - 2014)
- The Conservation of Water Resources and Rivers Law 2006 (Amended 2017)
- The Myanmar Engineering Council Law (2013) (Amended 2019, 2022)
- Myanmar Fire Force Law (2015)
- The Labour Organization Law (2011)
- The Minimum Wages Law (2013)
- The Payment of Wages Law (2016)
- The Workmen's Compensation Act 1924 (Amendment 1951, 1955, 1957, 2005)
- The Social Security Law (2012)
- The Occupational Safety and Health Law (2019)
- The Protection and Preservation of Cultural Heritage Regions Law (2019)
- The Protection and Preservation of Antique Objects Law (2015)
- The Protection and Preservation of Ancient Monuments Law (2015)
- The Forest Law (2018)
- The Conservation of Biodiversity and Protected Areas Law (2018)
- Prevention of Hazard from Chemical and Related Substances Law (2013)
- The Electricity Law (2014)
- The Export and Import Law (2017)
- Underground Water Act (1930)
- Public Health Law (1972)

In addition to the national legislations, the project proponent will refer following national and international guidelines during the implementation of project.

- National Environmental(Quality)Emission Guidelines (2015)
- Myanmar National Building Code (2020)
- Myanmar Fire Safety Code (2020)
- National Drinking Water Quality Standard
- Environmental, Health, and Safety Guidelines for Tourism and Hospitality Development by International Finance Corporation (IFC)
- International Finance Corporation's (IFC's) Performance Standards
- International Labour Organization (ILO) Guidelines on decent work and socially responsible tourism (2017)

The following government departments are relevant with the development of Taung Thaman Thitsar Resort and the project proponent will have to keep in touch with those departments in order to operate the project successfully in accordance with the legislations.

1. Mandalay Regional Government
2. Myanmar Investment Commission (MIC)
3. Directorate of Investment and Company Administration (DICA)
4. Environmental Conservational Department (ECD)
5. Department of Archeology and National Museum
6. General Administration Department (GAD)
7. Mandalay City Development Committee (MCDC)
8. Directorate of Hotel and Tourism
9. Ministry of Labour
10. Internal Revenue Department
11. Department of Public Health
12. Mandalay Electricity Supply Corporation (MESC)

3. Project Description

The proposed project is called the "Taung Thaman Resort:" to support, in one way, the development of Myanmar tourism, showcase Myanmar rural culture, and create a place for public recreation. This project will be implemented by the Taung Thaman Thitsar Company Limited.

3.1 Project Location and Size

Taung Thaman Lake Resort project is located on the south-east bank of the infamous Taung Thaman Lake, adjacent to the U Bein Bridge on the north, and the location is U Paing no. 99, 100, 103/2. 104, 105, 134/1, 135, 138/1, 138/2, 139, 150/2, 152/1, 152/2, 153/1, Taung Thaman plot no. (592), Taung Thaman villagetract, Amarapura Township, Mandalay District, Mandalay Region.

The project occupies a lot area of about 40.27 acres. The total floor area is planned to be around 119,000 m2. Urbanization already reached the vicinity of Taung Thaman Lake.

3.2 Project Life Span and Budget

According to submission to Myanmar Investment Commission, the life span of the proposed project is 50 years, which started on 15-05-2014 and will expire on 26-03-2064. The investment capital for the proposed project will be (32,382,245,052) Kyats.

3.3 Project Components

List of project's components and its associated facilities are shown in the following table and the area used of project's components and its associated facilities is shown in table following.

Sr.	Component	Quantity (no.)
1.	Shop House (Grade – A)	18
2.	Shop House (Grade – B)	16
3.	Shop House (Grade – C)	20
4.	Shop House (Grade – D)	22
5.	Court Yard	15
6.	Bank	1
7.	Shopping Mall	6
8.	Tourism Service Center	1
9.	Banquet Hall	1
10.	Sale Office	1
11.	Water Treatment Facility	1
12.	Wastewater Treatment Facility	1
13.	Swimming Pool (if included)	1
14.	Generator Room	1
15.	Transformer Room	1
16.	Tower	1
Total		107

A total of 101 units will be built and the shop houses are 2 Storyed Building, and will mainly sell Myanmar cultural and traditional arts and crafts. In addition, a tourism service center will be built for the service business that can provide tourism, and it will have 96 rooms.

Sr.	Items		Unit	Area
1	Lot area		m2	200319.57
2	Building footprint area		m2	50706.35
3	Total floor area		m2	119476.78
	of which	Shophouse A	m2	19433.70
		Shophouse B	m2	19989.90
		Shophouse C	m2	27209.51
		Lakefront Shophouse Type D	m2	11360.40
		Private Club Type E	m^2	1058.00
		Banquet hall	m^2	9270.00

		Conference center	m^2	3974.86
		Hotel	m^2	4870.01
		Shopping center	m^2	14776.98
		Supermarket	m^2	4249.29
		Sales office	m^2	2229.13
		Transformer room	m^2	500.00
		Generator set room	m^2	350.00
		Tower	m^2	205.00
4	FAR		-	0.60
5	Greening rate		-	35.2%
6	Building density		-	25.3%
7	Household count		Unit	220
8	Residents headcount		Head	704
9	Parking spaces		Space	1120

3.4 Structural Design

3.4.1 Basic Principle

- Wind Resistance: The structure is designed to withstand strong winds, specifically those expected to occur once every 50 years. The reference wind pressure is specified as 0.30 kilonewtons per square meter.
- Snow Load: The design does not account for snow pressure, indicating that the structure is not expected to bear any significant snow load.
- Earthquake Considerations: The design takes into account seismic activity. The reference magnitude for earthquakes is VIII, and the design considers a basic acceleration of ground motion of 0.20g. The structure falls under group 3 of earthquake-prone areas in major cities.
- Geotechnical Conditions: For specific information about the site's soil and geological conditions, reference is made to a geotechnical report. This report provides essential details about the ground on which the structure will be built.

3.5 Fire Protection Design

3.5.1 Architectural Discipline

The buildings of this project are classified as category-2 buildings. The residential buildings are designed with grade-2 fire resistance. The fire lanes will be at least 4m wide with a bearing capacity not less than 30 tons.

3.5.2 Water Discipline

Outdoor Fire Hydrants

Instead of separate pipes for fire and regular water, this system combines them into one network. Red fire hydrants will be spaced about 120 meters apart, with some stretching to 150 meters. Each hydrant can pump water at 40 liters per second, and firefighters have 2 hours to extinguish a fire. To ensure enough water, the system is designed to handle 288 cubic meters per hour.

Two pumps will be used to boost water pressure for fighting fires. One pump will be active, while the other is a backup. Water will be drawn from outdoor wells instead of relying solely on the city's water supply.

Indoor Fire Hydrants

Each indoor hydrant can pump 20 liters of water per second. Firefighters have 2 hours to extinguish a fire. The system is designed to handle 144 cubic meters of water per hour. Two pumps will boost water pressure for fighting fires (one active, one standby). Hydrants will be easily visible and strategically placed. Water pressure will be enough for two fully-filled fire hoses simultaneously at any indoor location, meeting fire code requirements. Ring-shaped pipe layout (horizontal and vertical) ensures water supply stability. Every hydrant and sprinkler system is connected to a separate 18 cubic meter roof water tank. Tank placement ensures minimum pressure of 10 meters even for the most distant hydrant.

Automatic Sprinkler System

This system uses automatic sprinklers to control fires in the banquet complex and shopping center. Pipes will always be filled with water. It is designed for medium-risk fires (grade II). Each sprinkler sprays water at a rate of 8 liters per minute per square meter. Each sprinkler covers an area of 160 square meters. Sprinklers will operate for at least 1 hour.

3.5.3 Electrical Discipline

Power supply and switching

Fire pumps, smoke fans, alarms, emergency and evacuation lighting, domestic water pumps, fire elevators, and sewage pumps will have the highest (grade 1) reliability, ensuring they function even during power outages. These critical systems have backup power supplies that automatically switch on if needed.

Emergency Lighting

The commercial and banquet buildings will have emergency lighting in the stairways, anterooms, evacuation passages, mechanical rooms and garages. Evacuation signage will also be set up in the evacuation passages and exits.

Fire Alarm

The sales office will have a central security and fire monitoring room. Key areas like transformer and generator rooms will have sensors for temperature and smoke detection. Additionally, manual fire alarm buttons will be readily available in corridors and exits. In case of a confirmed fire alarm, the system will spring into action. Firefighting pumps will activate, regular ventilation will shut down while smoke extraction kicks in for the affected areas.

3.6 Energy Efficiency

The building design prioritizes energy efficiency across various disciplines:

Architecture: Buildings are aligned with wind patterns, have simple shapes, and use minimal glass to reduce heat loss while maintaining natural light and ventilation.

HVAC: The heating and cooling system is designed to work with the building shell to minimize energy waste, and uses low-noise, energy-efficient equipment.

Water: Eco-friendly water fixtures and appliances are used throughout, including water-saving toilets and a recycling system for public fountains. Wastewater is treated before release, with separate treatment for oily sewage.

Electricity: Substations and transformers are placed efficiently, low-loss equipment is used, and power consumption is optimized through automatic adjustments and energy-saving lighting. Variable-frequency drives are employed to regulate power used by mechanical systems like pumps and fans.

3.7 Electrical Design

Buildings will have separate power supplies for regular and fire protection needs. Electricity comes from the city grid and backup generators. Each building has its own transformers, and electrical equipment is graded based on importance, with critical systems having redundant power supplies. A dedicated room houses phone, internet, and cable TV equipment for the entire development. Each apartment has individual connections for these services. Lightning protection is integrated into the building foundations and grounding system.

3.8 Water Supply

Underground wells feeding a 300,000-gallon reservoir. All buildings have water storage tanks (1,600 to 4,000 gallons) and auto pressure pumps. Water quality meets drinking standards. Daily water needs will be 800 cubic meters.

From underground wells, delivered by ring pipelines for stability. Pressure: 0.30 MPa. Peak daily volume: 600 cubic meters, peak hourly: 31.0 cubic meters. System uses wells, pumps,

water towers, and user connections. Vertical design ensures pressure at lowest fixture is under 0.45 MPa. Two pump rooms and two water tanks (80m2 and 80m3 each) will be built.

Daily peak volume is estimated about 335 cubic meters, peak hourly: 31.0 cubic meters. Black and grey water will be separated. Sewage treatment plant with septic tank cleanses domestic sewage before releasing it into the lake. Air conditioner condensation is drained separately.

Swimming Pool

The resort will feature a refreshing 20-meter by 15-meter swimming pool, constructed with sturdy reinforced concrete. To ensure sparkling clean water, the pool will utilize a filtration system that includes a balancing tank. This system will hold 600 cubic meters of water and keep it sparkling clean through a combination of circulating pumps, D.E. filters, and a salt chlorination system.

3.9 Project Activities

This project will consist of four phases, and Taung Thaman Thitsar Company Limited will be fully responsible for building the shophouses, hotel, conference center and so on, in line with the design codes the Myanmar National Building Code 2022.

Pre-construction phase

The key activities of the Taung Thaman Resort project in this phase are as followed;

- Project Planning
- Design and Permits
- Contractor Selection
- Project Schedule
- Procurement Plan and Material Selection
- Environmental Management Plan.

Construction Phase

The construction phase will be prolonged for 11 years. The activities started in June, 2014 and it is expected to end in 2025. Various construction works will be done during this period.

3.10 Materials and Equipment

A lot of machinery and equipment will also be required to successfully construct the building. The following is the list of equipment and machinery that will be used in the construction phase of this project;

Taung Tha Man Thit Sar Company Limited
List of Machineries, Equipment and Others to be purchased in local

Exhibit-2-2

Sr No.	ITEM NAME	Unit	Qty	Unit Price	Amount
	Machineries				
1	But Welder	Unit	8	2,440,800.00	19,038,240.00
2	Bending Machine	Unit	8	788,400.00	6,149,520.00
3	Steel Bar Straightening Machine	Unit	8	2,440,800.00	19,038,240.00
4	Steel Bar Cutting Machine	Unit	8	3,098,400.00	24,167,520.00
5	Steel Bar Set of Silk Machine	Unit	4	2,816,400.00	11,828,880.00
6	Welding Machine	Unit	40	243,600.00	9,792,720.00
7	Air Compressor	Unit	20	1,126,800.00	22,310,640.00
8	Intercon	Unit	160	66,000.00	10,573,200.00
9	Tower Crane (C 5510)	Unit	8	157,946,000.00	1,232,018,800.00
10	Tower Crane (C 5510)	Unit	4	157,946,000.00	663,333,200.00
11	Construction Elevator	Unit	12	30,076,800.00	360,921,600.00
12	Pump Pipe	Unit	4004	19,200.00	76,884,480.00
13	Slump Pipe Accessories	Unit	1201	2,400.00	2,882,880.00
14	Pumping Station (HTB 60)	Unit	8	5,634,000.00	43,945,200.00
15	Material Spreader (HGY 18)	Unit	10	2,253,600.00	22,986,720.00
16	Planer	Unit	12	1,878,000.00	22,536,000.00
17	Commercial Elevator	Unit	56	60,093,600.00	3,353,222,880.00
18	Service Truck	Unit	6	17,433,350.00	104,600,100.00
19	Service Car (Lexus LX 570)	Unit	4	119,262,400.00	429,624,640.00
20	Business Purpose Vehicle (Toyota Camry XLE Hybrid)	Unit	4	40,265,600.00	145,024,160.00
	Total				6,580,879,620.00

3.11 Employment

The construction period and operation will create employment opportunities for a significant number of workers. The workers who will be working on the construction and operation phase are local. With an estimated peak workforce of 100–120 individuals per day and an 8-hour workday, and as most workers will return to their homes after working hours, the project does not need to arrange the dormitory, but there will be a camp for the workers to take a rest. The proposed project could create opportunities with the ultimate number of 75 permanent staff in the operation phase.

3.12 Fuel Utilities

The energy as the fuel, the diesel will be used for the construction machinery. The estimated requirement amount of fuel is 15 gallons per day, and it will be bought from the nearest gas station. Moreover, this fuel will only be vehicles so that the fuel will not be stored at the project site. For the operation phase, there will not be much need for fuel, but only for generators.

3.13 Solid Waste Management

This project anticipates generating solid waste during both construction and operation phases. During construction, materials like concrete, wood, steel, and plastics will be major contributors due to demolition, excavation, and building activities.

Once operational, the resort, restaurant, and hotels are expected to produce household-like waste, including organic scraps, paper, plastic, glass, metal, and e-waste. On average, each person is estimated to generate around 1 kilogram of waste daily.

All collected waste will be temporarily stored before proper disposal at designated MCDC collection points. To encourage responsible waste management, the project will provide color-coded bins for segregation and informative posters near each bin. This approach aims to minimize environmental impact and promote sustainable waste management practices.

3.14 Wastewater

This project expects wastewater generation during both construction and operational phases.

Construction: Various activities using water will generate wastewater, including concrete mixing, equipment washing, site dewatering, dust control, and cleaning. This wastewater will be treated in a temporary sedimentation tank before discharge.

Operation: Residents are estimated to generate 80-100 gallons of wastewater per day, entering a treatment system. The main types of wastewater include: Greywater: From sinks, showers, and washing machines, containing less contamination than sewage. Blackwater: From toilets, containing human waste and requiring appropriate treatment. Kitchen wastewater: With food particles, oils, and detergents. Laundry wastewater: Containing detergent residues and lint.

3.14.1 Wastewater Treatment System

This project will treat sewage using a reliable "Johkasou" system from Kubota. Once operational, a septic tank with this treatment system will be installed on-site. One key advantage of Johkasou is its circulation system, which allows for repeated treatment, resulting in cleaner wastewater.

4. Description of Surrounding Environment

`4.1 Biodiversity

``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.

Floral components and faunal components are assessed in both direct and indirect sites of the proposed project. Taung Thaman Lake is not only wet land but also inland fishery area. Forty-five species of birds were recorded in the target area. Most of birds were wetland birds. The flora diversity exists in wetland, on-land, and cultivated land. Six species of aquatic (kaing, baydar, kyu…etc.), thirty-six species of on-land trees (meze, magyi, htan, htein are mostly abundant), and ten species of vegetation (paddy, groundnut, sunflower…). Many micro algae species exist but are not recorded. Fourteen species of fishes were recorded. And fourteen species of butterfly, ten species of odonate, and eight species of rodents and reptiles were recorded. Of all the recoded flora and fauna species, there was no endangered or threaten species and also endemic species comparing to the IUCN Red List.

4.2 Physical Environment

4.2.1 Ambient Air Quality

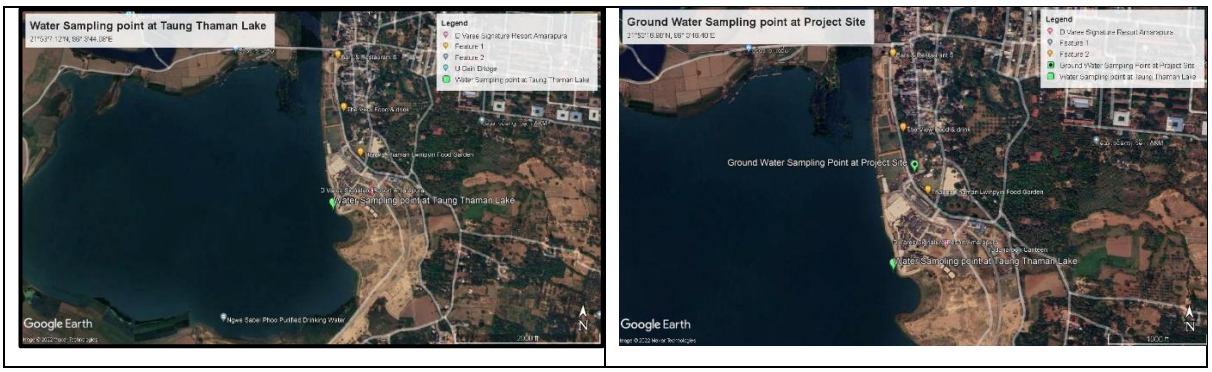
Three survey points for ambient air quality measuring are located the front of the Taung Thaman Resort Project office, near the construction area and the boundary of near the Tae Nan Village and project area of Taung Thaman Resort.

The parameters for air quality survey were SO2, NO2, CO, PM2.5, PM10, Wind Speed and Wind Direction. The detail locations of air quality survey points are presented in figure below.

The measured air quality results from the above locations are compared with the National Environmental (Quality) Emission Guidelines values and none of the results are exceeded the guidelines values. The detailed measured results are fully presented in the ESIA report.

4.2.2 Water Quality

The baseline water quality status in the region is established by analyzing samples at five locations consisting of Taung Thaman lake water and groundwater samples from project site. The water samples were analyzed for their physiochemical properties in ALARM Ecological Laboratory.



The criteria for the selection of sites was determined on the project location, agricultural land, slope of the land surface, topographical land upstream and downstream of the project, channels adjacent to irrigated fields, potential areas of sewage and the location of the drainage and its discharge system.

By comparing the laboratory analysis results of ground water sample from project site with WHO drinking water guideline values, ground water sample has higher Chloride and Sulfate

value than that of WHO guideline values. One of the possible reasons that high sulfate value in ground water is that sulfate minerals contents in soil and rock formation is probably high and some of the sulfate dissolve into the ground water. Other physiochemical properties of all samples are in accordance with WHO guideline values. The detailed measured results are presented in the ESIA report.

4.2.3 Noise and Vibration Study

Noise level and vibration measuring was conducted at three different locations around the project site as described in the following figure. The noise environment at the project is dominated by traffic noise and some human activities, construction activities with most activities during daytime hours. The detailed monitoring results are fully described in the ESIA report.

4.2.4 Soil Quality

Soil sample was collected from the project site compound to record the current condition of soil. The sample was analyzed for their physiochemical properties in Soil Laboratory, Land Use Department of Ministry of Agriculture and Irrigation. And the results are presented in the ESIA report.

4.2.5 Topography and climate

The study area is located on the Southeast Bank of Taung Thaman Lake, adjacent to the U Bein Bridge on the north. The study area is currently occupied by villages, uncultivated lands, fish ponds. Therefore, the topography is quite flat, with no major differences in altitude.

The climate of project area is located in tropical wet and dry climate. Average temperature is 21°C and 31°C.

4.3 Socioeconomic Component

Socioeconomics profile of the local communities including Taung Thaman village, Nwar-noe Taw Su village, Ywar Thit village and Tae Nan Thar village are established by the data obtained by a systematic household data survey. Sample size is calculated using Cochran formula with a confidence level of 95% and a margin of error 5%. There are about (514) numbers of households in the villages where (221) numbers of households were sampled. And the results of age group, gender ratio, marital status, educational conditions and employments are presented in the EIA report.

4.3.1 Stakeholder Analysis

Stakeholders are categorized in four groups 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.

4.3.2 Project Affected Area

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

Sr.	Category	Location	Factor
1	Human Settlements	Taung Thaman village	Access road
		Nwar-noe Taw Su village	
		Ywar Thit village	
		Tae Nan Thar village	
2	Land Environment	Adjacent farmlands Project compound	Waste Irrigation channels Soil
3	Biological Environment	Within 5 km around the project	Pollution
4	Air and Noise Environment	Within project compound and nearby community	Noise levels
5	Water Environment	Taung Thaman Lake and ggroundwater	Water usages Water quality Waste water

4.4 Cultural Heritage Component

The development site identified in the Taung Thaman Waterfront Development Structure Plan includes the U Bein Bridge, which is listed on the State Registered of Heritage places. In addition there are a number of heritage places and structures that are adjacent to the waterfront site that could potentially be impacted upon by the proposed development. These places and structures, listed below, will be considered by this report.

Place	Listed/ Unlisted	Land use Type	Location	Remarks
Taung Tha Man Lake	Listed	Water Management	Amarapura Township	
U Bein Bridge	Listed	Pathways Cultural landscapes	Taung Tha Man Lake	
MAHASAKYA RAMSI Taung Tha Man Kyauk Taw Gyi	Listed	Cultural	Taung Tha Man Village	
Pahtoe Daw Gyi Phaya (MAHAVIJAYARAMSI)	Listed	Cultural	Northern Part of Taung Tha Man Lake	
Aung Myay Dataw Phaya	Unlisted	Cultural	Taung Tha Man Village	
Shwe Moat Htaw Phaya	Unlisted	Cultural	Taung Tha Man Village	
Kan U Kyaung Monastery Compound	Unlisted	Cultural	Ywa Thit Village	
Tae` Nan Thar Phaya	Unlisted	Cultural	Aye-Mya-Thar-Yar-Kyaung (Monastery Compound)	

5. Impact Assessment and Mitigation Measures

To identify the potential environmental and social impacts of the project, project activities were correlated with environmental and social receptors and their interactions were identified for potential environmental and social impacts. EIA team found out thirteen key environmental and social impacts of the project on its environment.

5.1 Impact Identification

5.1.1 Construction Phase

There are eleven environmental and social aspects that can have impacts during the construction phase of the Taung Thaman Thitsar Resort project such as impacts on Biodiversity, Ambient Air Quality, water Body, Soil, Noise and Vibration, Traffic, Cultural Heritage, Solid Waste Generation, Hazardous Waste, Occupational Safety and Health, Local Economy.

5.1.2 Operation Phase

There are fourteen environmental and social aspects that can have impacts while operating the Taung Thaman Thitsar Resort such as impacts on Biodiversity, Ambient Air Quality, Water Body, Soil, Noise and Vibration, Energy Consumption, Traffic, Cultural, Landscape, Fire Hazards, Solid Waste Generation, Hazardous Waste, Occupational Safety and Health, Local Economy.

5.2 Impact Assessment

Assessment of the identified impacts was carried out by rating matrix method. The summary of assessment results are shown in the following table,

CONSTRUCTION								
Sr.	Impact	Severity	Spatial Scope	Duration	Frequency	Probability	Total Rating	Significance Level
1	Impacts on Biodiversity	3	3	4	4	4	80	Medium - High
2	Impacts on Ambient Air Quality	4	3	3	4	4	80	Medium - High
3	Impacts on Water Body	4	3	3	4	4	80	Medium - High
4	Impacts on Soil	4	2	2	4	4	56	Low - Medium
5	Impacts on Noise and Vibration	4	3	3	4	4	80	Medium - High
6	Impacts on Traffic	4	3	3	5	4	90	Medium - High
7	Impacts on Cultural Heritage	4	3	3	4	4	80	Medium - High
8	Impacts from Solid Waste Generation	4	2	3	5	4	81	Medium - High
9	Impacts from Hazardous Waste	4	2	3	3	4	63	Low - Medium
10	Impacts on OSH	5	2	3	4	4	80	Medium - High
11	Impacts on Local Economy	4	3	4	5	4	99	Medium - High

OPERATION								
Sr.	Impact	Severity	Spatial Scope	Duration	Frequency	Probability	Total Rating	Significance Level
1	Impacts on Biodiversity	2	3	4	1	3	36	Low
2	Impacts on Ambient Air Quality	3	3	4	3	3	60	Low - Medium
3	Impacts on Water Body	4	3	4	5	5	110	High
4	Impacts on Soil	3	1	4	2	4	48	Low
5	Impacts on Noise and Vibration	3	1	4	2	4	48	Low
6	Impacts on Energy Consumption	4	3	4	5	4	99	Medium - High
7	Impacts on Traffic	4	3	4	5	4	99	Medium - High
8	Impacts on Cultural Heritage	3	3	4	4	4	80	Medium - High
9	Impacts on Landscape	3	3	4	4	4	80	Medium - High
10	Impacts from Fire Hazards	5	3	1	5	4	81	Medium - High
11	Impacts from Solid Waste Generation	4	3	4	5	4	99	Medium - High
12	Impacts from Hazardous Waste	3	2	4	3	4	63	Low - Medium
13	Impacts on OSH	3	1	4	4	4	64	Low - Medium
14	Impacts on Local Economy	4	3	4	5	4	99	Medium - High

Table . Impacts Rating With Mitigation Measures

CONSTRUCTION								
Sr.	Impact	Severity	Spatial Scope	Duration	Frequency	Probability	Total Rating	Significance Level
1	Impacts on Biodiversity	2	3	4	2	3	45	Low
2	Impacts on Ambient Air Quality	2	2	3	3	3	42	Low

3	Impacts on Water Body	2	2	3	3	3	42	Low
4	Impacts on Soil	3	3	2	3	3	48	Low
5	Impacts on Noise and Vibration	3	2	3	3	3	48	Low
6	Impacts on Traffic	2	2	3	4	2	42	Low
7	Impacts on Cultural Heritage	2	3	3	3	3	48	Low
8	Impacts from Solid Waste Generation	2	2	3	4	2	42	Low
9	Impacts from Hazardous Waste	2	2	3	3	3	42	Low
10	Impacts on OSH	3	1	3	3	3	42	Low
11	Impacts on Local Economy	4	3	4	5	5	110	High
OPERATION								
Sr.	Impact	Severity	Spatial Scope	Duration	Frequency	Probability	Total Rating	Significance Level
1	Impacts on Biodiversity	2	2	4	1	2	24	Very Low
2	Impacts on Ambient Air Quality	2	2	4	3	2	40	Low
3	Impacts on Water Body	2	3	4	3	2	42	Low
4	Impacts on Soil	1	1	4	1	1	12	Very Low
5	Impacts on Noise and Vibration	2	2	4	3	2	40	Low
6	Impacts on Energy Consumption	3	3	4	4	2	60	Low - Medium
7	Impacts on Traffic	2	2	4	4	2	48	Low
8	Impacts on Cultural Heritage	2	3	4	3	2	45	Low
9	Impacts on Landscape	2	3	4	3	2	45	Low
10	Impacts from Fire Hazards	2	2	1	5	2	35	Low
11	Impacts from Solid Waste Generation	2	2	4	4	2	48	Low
12	Impacts from Hazardous Waste	2	1	4	3	3	42	Low

13	Impacts on OSH	2	1	4	3	2	35	Low
14	Impacts on Local Economy	4	3	4	5	5	110	High

6. Environmental Management Plan

The core objective of preparing Environmental Management Plan is to manage the identified potential impacts systematically within a specific time frame for the prevention of environmental aspects and clearing up the roles and responsibilities between the institution bodies. EMP is a site-specific plan developed to ensure that the proposed project is implemented in accordance with environmental legislations and in environmentally sustainable manners.

6.1 EMP Implementation Team

In order to implement project's EMP, TTMS Co., Ltd will organize a team which is responsible for successful implementation of EMP.

No.	EMP Implementation Team Member	Roles
1.	Project Director	• Oversees the overall planning, execution, and monitoring of the project, including environmental management activities. • Ensures that environmental considerations are integrated into project planning and decision-making processes.
2.	Project Manager	• Supports the Head of team in implementing the EMP and managing environmental initiatives. • Assists in data collection, analysis, and reporting related to environmental performance indicators.
3.	Project Engineer	• Provides technical expertise and guidance on environmental management and sustainability practices. • Assists in the design and implementation of environmental controls and mitigation measures.
4.	Health and Safety Officer	• Ensures the health and safety of personnel and the public during project activities. • Identifies and addresses potential health and safety hazards associated with environmental factors.
5.	Administrative Assistant	• Assists in monitoring and tracking compliance with environmental regulations, permit conditions, and project requirements. • Alerts the team to upcoming deadlines, regulatory changes, and compliance issues that require attention or action.

		Facilitates communication within the team and coordinates meetings, conference calls, and other communication activities.
	Senior Executive	• Oversees the implementation of the Environmental Management Plan (EMP) and ensures compliance with environmental regulations and policies. • Acts as the primary point of contact for environmental matters and liaises with regulatory agencies, stakeholders, and project teams.

6.2 Summary of Construction EMP

Managed environmental impact	Source of impact	Mitigation Measures	Management Action
Impacts from Noise and Vibration			
• Excessive noise • Vibration effects, from construction activities such as piling, which could damage the structure of nearest built heritage. • Disturbing noise	• Various construction activities • Operations of heavy machineries • Emergency use of diesel generators • Use of on-site tools • Increased vehicular traffic	Regular Maintenance to Prevent Mechanical Noise.	• Implement a comprehensive maintenance schedule for machinery and equipment to ensure optimal performance and reduce mechanical noise. • Conduct regular inspections and repairs to address any potential sources of noise pollution promptly.
		Avoidance of High Noise Construction Work at Night	• Establish clear guidelines and policies that restrict high noise construction activities during nighttime hours to minimize disturbances to nearby residents • Coordinate construction schedules to prioritize quieter tasks during nighttime operations.
		Communication Channels for Noise Disturbance Issues.	• Establish effective communication channels, such as a hotline or online reporting system, for residents to report noise disturbances promptly. • Designate responsible personnel to address noise complaints and take appropriate action to mitigate issues.
		Avoidance of Heavy Machinery Movements at Night.	• Establish guidelines that prohibit the movement of heavy machinery during nighttime hours unless absolutely necessary. • Plan construction activities to minimize the need for heavy machinery operations during late hours.
		Implementation of Appropriate Vehicular Traffic Speed	• Enforce speed limits and traffic regulations to control vehicular noise in and around the project site.

Managed environmental impact	Source of impact	Mitigation Measures	Management Action
			• Educate drivers and construction personnel on the importance of adhering to speed limits to minimize noise pollution.
		Provision of Hearing Protection Equipment	• Provide hearing protection gear, such as earplugs or earmuffs, to workers exposed to high noise levels during construction activities. • Conduct training sessions to educate workers on the proper use and maintenance of hearing protection equipment.
Impacts on Traffic			
• Traffic related hazards • Dust and carbon dioxide emissions • Road damage	• Increased traffic from transportation of raw materials, machinery for construction and construction workers.	Project Access Routes	• Designate specific access routes for construction vehicles to minimize disruption to local traffic. • Implement traffic control measures to direct construction traffic away from residential areas.
		Transportation Planning for Raw Material	• Develop a transportation plan for raw materials to minimize traffic congestion. • Coordinate with suppliers to optimize delivery times and reduce trips
		Notification to Administration Office	• Notify local authorities about the construction project and planned activities. • Establish channels for ongoing communication with local officials.
		Setting Appropriate Traffic Speeds	• Enforce appropriate speed limits for construction vehicles within the project site and along access routes. • Provide training for construction personnel on speed limit compliance.
Impacts on Cultural Heritage			

Managed environmental impact	Source of impact	Mitigation Measures	Management Action
• Damaging the nearby built heritage due to vibrations from construction process.	• Project's various construction activities	Designs Based on Traditional Culture	• Collaborate with local cultural experts and heritage preservation organizations to incorporate traditional architectural elements and design motifs into the resort's buildings and structures. • Engage local artisans and craftsmen to contribute to the construction process and preserve traditional craftsmanship techniques.
		Compliance with Height Regulation	• Avoiding buildings' designs which are above 40 m in line with the MCDC regulations for cultural heritage environment. • Regularly monitor construction progress to ensure compliance with height restrictions and promptly address any deviations or concerns.
Impacts from Solid Waste Generations & Hazardous Waste			
• Depletion of Taung Thaman Lake water quality. • Soil quality degradation. • Contaminated runoff and plastic wastes. • Pests and vectors attracted to garage and food waste. • Foul smell and serious health issues to the nearby communities.	• Construction wastes • Chemical use in construction process • Domestic wastes and sewage from construction workers	Ensuring Distance from Nearby Communities	• Establish waste disposal areas at a safe distance from nearby communities to minimize health and environmental risks. • Clearly demarcate and secure the waste disposal sites to prevent unauthorized access and potential hazards.
		Prohibiting Waste Disposal into Taung Thaman Lake	• Strictly enforce policies and regulations prohibiting the disposal of solid and hazardous waste into Taung Thaman Lake. • Implement monitoring measures to detect and deter any illegal dumping activities near the lake area.

Managed environmental impact	Source of impact	Mitigation Measures	Management Action
		Implementing Structurally Sound Retaining Wall Fences	• Construct structurally sound retaining wall fences around waste disposal areas to prevent runoff and contamination of surrounding soil and water bodies. • Regularly inspect and maintain the integrity of the retaining walls to ensure effective containment of waste materials.
		Placement of On-Sit Waste Disposal Areas	• Designate specific on-site waste disposal areas equipped with appropriate containment measures and waste segregation facilities. • Implement proper waste management practices, including sorting, recycling, and disposal, to minimize environmental impact and maximize resource recovery.
		Implementation of Hazardous Waste Management Plan	• Develop and implement a comprehensive hazardous waste management plan that outlines procedures for the safe handling, storage, transportation, and disposal of hazardous materials. • Provide training and resources to personnel involved in hazardous waste management to ensure compliance with regulatory requirements and industry best practices.
Impacts on Local Economy			
• Job opportunities for the local communities • Values of lands around the project will be raised. • General economic conditions of the local	Development of the project	Priority Job Opportunities for Local People	• Prioritize hiring local residents for various positions, including construction labor, administrative roles, and service staff. • Provide training and skills development programs to enhance the employability of local residents and promote long-term economic empowerment.

Managed environmental impact	Source of impact	Mitigation Measures	Management Action
communities will be improved.			
Impacts on Ambient Air Quality			
• Excessive dust emission • Generation of greenhouse gases • Deterioration of Air Quality	• Various construction activities. • Emergency use of diesel generators	Dust Suppression During Construction	• Implement dust suppression measures, such as water spraying and dust control agents, at construction sites to minimize airborne dust particles. • Conduct regular watering of construction areas and exposed soil surfaces to prevent dust generation and dispersion.
		Covering Dump Trucks During Loading and Hauling	• Require all dump trucks involved in loading and hauling operations to be covered to prevent the escape of dust and particulate matter. • Enforce strict adherence to covering procedures and provide training to truck operators on proper covering techniques.
		Spraying Unpaved Roads and Tracks	• Apply dust suppressants or water regularly to unpaved roads and tracks used for construction traffic to minimize dust emissions. • Monitor road conditions and reapply suppressants as needed to maintain effective dust control.
		Regular Inspection and Maintenance Equipment	• Establish a comprehensive inspection and maintenance program for construction equipment and vehicles to ensure optimal performance and minimize emissions. • Conduct routine checks for leaks, malfunctions, and emissions compliance, and address any issues promptly.

Managed environmental impact	Source of impact	Mitigation Measures	Management Action
		Regular Inspection and Maintenance Equipment	• Install wheel wash systems or provide designated washing areas to clean dump truck wheels before leaving construction sites. • Enforce strict adherence to wheel washing procedures to prevent the spread of dust and contaminants onto public roads.
		Implementing of Speed Limits	• Establish and enforce speed limits for construction vehicles and equipment within project areas to minimize dust generation and improve safety. • Communicate speed limit regulations to all construction personnel and contractors, and monitor compliance through regular enforcement measures.
Impacts on Water Body			
• Contaminated runoff and oil spilled. • Degrading the quality of Taung Than Man Lake • Degradation • of aquatic life quality in Taung Thaman Lake. • Depletion of groundwater.	• Waste generation from various construction activities. • Chemical substances used for certain construction activities	Settling of Construction Wastewater	• Implement settling ponds or sediment traps to capture and treat construction wastewater before it is discharged into water bodies. • Regularly inspect and maintain settling facilities to ensure proper functionality and effectiveness in removing sediment and contaminants.
		Prevention of Mud Water runoff	• Implement erosion control measures, such as silt fences, straw bales, and mulching, to prevent mud water runoff from construction sites into nearby water bodies. • Monitor erosion control measures regularly and adjust as needed to maintain their effectiveness.

Managed environmental impact	Source of impact	Mitigation Measures	Management Action
	• Groundwater use for construction activities	Exploration of Alternative Water Sources	• Investigate and explore alternative water sources, such as rainwater harvesting or recycled water, for construction activities to reduce reliance on freshwater sources. • Implement systems for collecting and treating alternative water sources for use in construction activities wherever feasible.
		Discharge of Wastewater with Minimal Impact	• Implement best management practices (BMPs) to minimize the environmental impact of wastewater discharge, including controlling flow rates and monitoring water quality parameters. • Conduct regular monitoring of discharged wastewater to ensure compliance with regulatory standards and minimize ecological harm.
		Construction of Adequate Drainages	• Construct adequate drainage systems to manage stormwater runoff and prevent flooding or erosion that could impact nearby water bodies. • Design drainage infrastructure to effectively channel runoff away from construction sites and minimize sediment and pollutant transport into water bodies.
		Treatment of Wastewater Before Disposal	• Install and operate wastewater treatment systems to treat construction wastewater before disposal, ensuring compliance with water quality standards and regulations.

Managed environmental impact	Source of impact	Mitigation Measures	Management Action
			• Implement appropriate treatment processes, such as sedimentation, filtration, and biological treatment, based on the characteristics of the wastewater and local regulatory requirements.
		Safe Handling of Oil and Fuel	• Develop and implement protocols for the safe handling, storage, and disposal of oil and fuel to prevent spills and contamination of water bodies. • Provide training for construction personnel on proper handling procedures and emergency response protocols in the event of a spill or leak.
Impacts on Soil			
• Removal of topsoil due to excavations for foundations and other earth work. • Alteration of soil texture, density, structure and chemistry due to soil mixing, wetting, stockpiling and compaction.	• Various construction activities. • Soil Alteration • Soil Contamination • Soil Erosion	Restriction of Construction Activities to Designated Areas	• Establish clearly defined construction zones and boundaries to limit construction activities to designated areas. • Implement barriers or fencing to prevent encroachment into protected or sensitive soil areas. • Monitor construction activities to ensure compliance with designated areas and minimize soil disturbance outside of approved zones.
		Limiting Soil Compaction	• Implement soil protection measures, such as the use of temporary coverings or mulch, to minimize soil compaction during construction activities. • Utilize specialized equipment and construction techniques that reduce soil compaction and minimize disturbance to the natural soil structure.

Managed environmental impact	Source of impact	Mitigation Measures	Management Action
• Localized soil contamination from accidental spills and leaks of fuels and chemicals. Erosion, Slope alteration, vegetation removal and drainage patterns.		Proper Use and Control of Hazardous substance	• Develop and enforce strict protocols for the use, storage, and disposal of hazardous substances during construction activities. • Provide training to construction personnel on proper handling procedures and safety precautions when working with hazardous materials. • Implement spill prevention and response measures to minimize the risk of soil contamination from hazardous substance leaks or spills.
		Rehabilitation and Restoration of Soil	• Develop a soil rehabilitation and restoration plan to mitigate any adverse impacts on soil quality resulting from construction activities. • Implement soil conservation practices, such as erosion control measures and revegetation efforts, to stabilize soil and restore natural habitat.
Impacts on Occupational Safety and Health			
• Accident with project heavy vehicles resulting in injury or death. • Occupational hazard such as falling from height, hit by fallen objects, injure by sharp objects, electric shock, and slipping etc.	• Accidents and Incidents in Working Area	Safe and Healthy Camps	• Establish safe and healthy living conditions within construction camps, including adequate sanitation facilities, clean water supply, and proper waste management systems. • Provide access to medical services and emergency response capabilities within construction camps to address health-related issues promptly.
		Provision of Personal Protective Equipment (PPE)	• Provide appropriate personal protective equipment (PPE), such as helmets, gloves, safety glasses, and respiratory protection, to all construction workers. • Conduct regular training sessions to educate workers on the importance of using PPE and proper safety practices.

Managed environmental impact	Source of impact	Mitigation Measures	Management Action
		Training on Occupational Safety and Health	• Conduct comprehensive training programs on occupational safety and health (OSH) for all construction workers and supervisory staff. • Provide specialized training for workers involved in high-risk tasks or working in hazardous environments.
		Provision of Health Care Facilities	• Establish on-site health care facilities or provide access to nearby medical facilities to address injuries, illnesses, and medical emergencies. • Ensure that health care facilities are equipped with essential medical supplies, trained personnel, and communication systems for emergency response.
Impacts on Biodiversity			
• Noise and Disturbance • Chemical Contamination • Altered Hydrology	• Various construction activities	Implementation of Environmental Management Programs (EMP)	• Implementation of Environmental Management Programs (EMP) • Development of Plantation and Landscaping • Adherence to Environmental Laws and Regulation. • Integrate measures to minimize habitat disturbance, prevent soil erosion, and mitigate the impact of construction activities on biodiversity into the EMP.
		Development of Plantation and Landscaping	• Incorporate green spaces, vegetative buffers, and wildlife corridors into the construction site design to facilitate movement and connectivity for fauna and flora.
		Adherence to Environmental Laws and Regulation	• Monitor construction activities closely to ensure compliance with environmental standards and promptly address any violations or environmental incidents that may arise.

6.3 Summary of Operational EMP

Managed environmental impact	Source of impact	Mitigation Measures	Management Action
Impacts from Noise and Vibration			
• Excessive noise • Disturbing noise	• Noise from Air Conditioners and other fixed equipment. • Noise from entertainment venues. • Emergency use of diesel generators. • Increased vehicular traffic	Incorporation of Silencers/ Mufflers	• Install silencers or mufflers on air conditioners, generators, and other fixed equipment to reduce noise emissions during operation. • Ensure that all equipment meets noise reduction standards and regulations to minimize disturbance to nearby areas.
		Preservation of Vegetation as Natural Buffer Zone	• Preserve existing vegetation or plant new trees and shrubs as a natural buffer zone to absorb and mitigate noise from vehicular traffic and operational equipment. • Implement landscaping strategies that enhance the effectiveness of vegetation as a noise barrier.
		Implementation of Appropriate Vehicular Traffic Speed	• Enforce appropriate speed limits for vehicular traffic within the resort premises to reduce noise from vehicle movements. • Educate drivers and resort staff on the importance of adhering to speed limits to minimize noise pollution and ensure safety.
Impacts on Energy Consumption			
• Increased energy demand and causing impacts on power distribution.	Electricity use for resort's various facilities	Appropriate Designs for Energy Supply	• Implement energy-efficient designs for energy supply systems, such as HVAC systems and electrical distribution, to optimize energy usage during operation.
		Installation of Energy Meters	• Regularly track and analyze energy consumption data to identify trends and implement targeted energy-saving measures

Managed environmental impact	Source of impact	Mitigation Measures	Management Action
• Alternations to distribution system and reach. • Unstable power system.		Implementation of Good Housekeeping Measures	• Implement good housekeeping practices to promote energy efficiency and reduce waste throughout the resort. • Encourage staff and guests to turn off lights, appliances, and electronics when not in use to conserve energy.
		Use of LED and Energy-Efficient Lighting	• Replace traditional lighting fixtures with LED lights and other energy-efficient lighting technologies to reduce energy consumption and operating costs.
		Preventive Maintenance Procedures	• Establish a preventive maintenance program for all energy-consuming equipment and systems to ensure optimal performance and efficiency. • Conduct regular inspections, cleaning, and servicing of HVAC systems, refrigeration units, and other energy-intensive equipment
		Minimization of Needless Daytime Lighting	• Implement daylight harvesting techniques and utilize natural lighting wherever possible to minimize the need for artificial lighting during daytime hours. • Install light sensors and timers to automatically adjust lighting levels based on natural light conditions and occupancy.
		Consideration of Renewable Energy Sources	• Explore the feasibility of integrating renewable energy sources, such as solar panels or wind turbines, to supplement the resort's energy supply. • Conduct a comprehensive assessment of renewable energy options and evaluate the economic and environmental benefits of implementation.
Impacts on Traffic			

Managed environmental impact	Source of impact	Mitigation Measures	Management Action
•Traffic related hazards •Small traffic congestions if the visitors decided to use village streets. •Dust and carbon dioxide emissions •Road Damage	Increased traffic from resort operations	Provision of Adequate Parking Spaces	• Ensure the provision of sufficient parking spaces within the resort premises to accommodate guests, employees, and visitors. • Designate parking areas strategically to optimize traffic flow and minimize congestion.
		Traffic Awareness Programs	• Implement traffic awareness programs to educate guests, employees, and visitors about traffic rules, parking regulations, and safe driving practices. • Distribute informational materials and signage throughout the resort to promote awareness and encourage responsible behavior.
		Setting Appropriate Traffic Speeds	• Establish and enforce appropriate speed limits within the resort premises to ensure the safety of pedestrians, cyclists, and motorists. • Install speed limit signs and traffic calming measures, such as speed bumps or rumble strips, to encourage compliance with speed regulations.
Impacts on Cultural Heritage			
• Introduction of project visual components that could diminish the integrity of Taung Thaman Lake and U Bein Bridge. • Impacts on views identified in	Project components with contemporary designs.	Landscaping and Replantation	• Preserve and maintain existing cultural features, such as historical structures, indigenous plants, and traditional landscapes. • Incorporate indigenous plant species and traditional landscaping techniques to reflect and honor the cultural heritage of the area.

Managed environmental impact	Source of impact	Mitigation Measures	Management Action
statements of significance for Taung Thaman Lake's environments. • Impacts on Landmark setting of Taung Thaman Lake. • Impacts on views from the vicinity of Taung Thaman Lake to U Bein Bridge.			
Impacts on Landscaping			
• Permanent visual changes to local environment. • Potential views blocking impact for the sightseeing. • Erosion	• Development of project's various facilities • Night-time lighting from TTMS Resort	Integration of Green Spaces and Landscaping Facilities	• Integrate green spaces and landscaping facilities throughout the resort to enhance aesthetics, provide recreational areas, and promote environmental sustainability. • Incorporate native plants and trees into landscaping designs to preserve biodiversity and support local ecosystems.
		Reduction of Decorative Lighting	• Evaluate existing lighting fixtures and reduce decorative lighting where possible to minimize light pollution and energy consumption. • Implement lighting control systems and timers to regulate lighting levels and reduce unnecessary illumination during off-peak hours

Managed environmental impact	Source of impact	Mitigation Measures	Management Action
• Increased runoff entering the Taung Thaman Lake. • Light Pollution		Use of Covered Bulbs with Downward Light Emission	• Install covered bulbs with downward light emission to minimize light spillage and glare, thereby reducing light pollution and preserving nighttime visibility. • Select lighting fixtures with shielded designs that direct light downward and prevent upward light dispersion.
• Impacts from Solid Waste Generations			
• Contaminated runoff and plastic wastes • Pests and vectors attracted to garage and food waste • Foul smell and serious health issues to the nearby communities. • Skin health issues when project's employees are exposed to the hazardous wastes • Degradation of soil quality.	• Domestic wastes from resort operation. • Organic wastes or food residues from bars, kitchens and restaurant. • Hazardous wastes from pesticides, bleaches, stain removers and chemicals use for the swimming pools. Generation of hazardous waste such as bulbs	Encouraging Staff Adoption of Recycling and Reuse Practices	• Conduct training sessions and awareness programs to educate staff about the importance of recycling and reuse practices. • Establish incentives and recognition programs to reward staff members who actively participate in recycling and waste reduction efforts
		Providing Adequate Bins and Skips and Developing Waste Segregation Practices	• Install adequate bins and skips in convenient locations throughout the resort premises for proper waste disposal. • Implement waste segregation practices by providing separate bins for different types of waste, such as recyclables, organic waste, and hazardous materials. • Clearly label bins and provide guidance on proper waste segregation to encourage compliance among staff and guests
		Prohibiting Waste Disposal into Taung Thaman Lake	• Enforce strict policies and regulations prohibiting the disposal of solid and hazardous waste into Taung Thaman Lake. • Educate staff and guests about the importance of preserving water bodies and the adverse effects of waste disposal on the environment

Managed environmental impact	Source of impact	Mitigation Measures	Management Action
• Degradation of Taung Thaman Lake's water quality	(CFLs), batteries and diesel		
Impacts on Local Economy			
• Job opportunities for the local communities • General economic conditions of the local communities will be improved. • Retail trades of local communities near the resort area will be developed with the development of other small business relating to new settlement. • Local community around the resort will be developed by the	• Development of the resort. • Visitors to the project.	Priority Job Opportunities for Local People	• Prioritize hiring local residents for job vacancies within the resort, including positions in administration, hospitality, maintenance, and management. • Provide training and skill development programs to enhance the employability of local workforce and promote career advancement opportunities.
		Corporate Social Responsibility (CSR) Programs for Economic Development	• Implement CSR programs focused on economic development initiatives that benefit the local community, such as vocational training, entrepreneurship support, and microfinance programs. • Foster partnerships with local stakeholders, government agencies, and non-profit organizations to maximize the impact of CSR initiatives on economic empowerment and sustainable development.
		Support for Tourism-Related Business	• Provide opportunities for local businesses to showcase their products and services within the resort premises, such as souvenir shops, cultural performances, and culinary experiences. • Facilitate networking events, trade fairs, and promotional activities that connect tourists with local businesses and artisans, enhancing the overall visitor experience and supporting the local economy.

Managed environmental impact	Source of impact	Mitigation Measures	Management Action
direct and indirect business opportunities relating to tourism development by the resort. • Flow of goods and trades will be improved by the development of new roads by the resort.			
Impacts on Ambient Air Quality			
• Generation of greenhouse gases. • Deterioration of Air Quality	• Emergency use of diesel generators. • Smoke from restaurant and kitchen. • Increased vehicular traffic	Tree Planting and Landscaping	• Implement extensive tree planting and landscaping initiatives throughout the resort premises to enhance air quality and provide natural filtration of pollutants. • Establish green spaces and vegetated buffers to absorb pollutants, mitigate dust, and improve overall air quality within the resort environment.
		Minimizing Ground-Leve Pollution	• Install high chimneys for the resort's combustion-based facilities, such as generators, to facilitate the dispersion of emissions and minimize ground-level air pollution.

Managed environmental impact	Source of impact	Mitigation Measures	Management Action
			• Ensure that chimney height and design comply with regulatory standards and best practices for minimizing air pollutant concentrations
		Implementing Speed Limits	• Establish and enforce speed limits for vehicles within the resort premises to reduce emissions of air pollutants from vehicular traffic. • Promote alternative transportation options, such as walking, cycling, or shuttle services, to reduce reliance on motor vehicles and minimize air pollution.
Impacts on Water Body			
• Contaminated runoff • Degrading the quality of Taung Than Man Lake • Degradation • of aquatic life quality in Taung Thaman Lake. • Depletion of groundwater	• Domestic waste water from resort components and activities in operation period. • Sanitary Sewage. • Groundwater use for resort operation activities	Adoption of Water Reduction Processes	• Implement water reduction processes and technologies to minimize water usage within the resort premises, including efficient irrigation systems, leak detection, and water recycling initiatives.
		Utilization of Water-Efficient Fixtures	• Install water-efficient fixtures and appliances, such as low-flow toilets, faucets, and showerheads, to reduce water consumption and minimize strain on local water resources
		Awareness Programs for Water Utilization	• Conduct awareness programs and educational campaigns to promote responsible water utilization practices among resort guests, employees, and stakeholders
		Provision of Covering for Drainages	• Install covers or protective barriers for drainages and stormwater outlets to prevent the entry of debris, pollutants, and sediment into nearby water bodies.
		Installation of Wastewater Treatment Units	• Install wastewater treatment units or systems to treat wastewater generated within the resort premises before disposal.

Managed environmental impact	Source of impact	Mitigation Measures	Management Action
			• Ensure that wastewater treatment facilities comply with regulatory standards and are designed to effectively remove contaminants and pollutants.
		Treatment of Wastewater Before Disposal	• Treat wastewater using appropriate treatment methods, such as filtration, sedimentation, and biological treatment, to remove impurities and ensure that discharged water meets quality standards.
		Cooperation with MCDC for Sanitary Sewage Disposal	• Collaborate with local authorities, such as the Mandalay City Development Committee, to ensure proper management and disposal of sanitary sewage in compliance with municipal regulations and guidelines.
		Ensuring Quality of Water for Dust Suppression	• Use clean and treated water for dust suppression activities to minimize the introduction of contaminants and pollutants into the environment.
		Adoption of Groundwater recharge practices	• Implement groundwater recharge practices, such as rainwater harvesting, permeable pavement, and green infrastructure, to replenish groundwater resources and sustain local hydrological systems.
Impacts from Fire Hazards			
• Serious injuries and fatalities. • Damage to Property. • Mental damage.	• Kitchen and Cooking Equipment • Electrical Equipment • Smoking • Intentional fires	Staff Training and Awareness	• Conduct regular fire safety training sessions for all resort staff members to educate them about fire hazards, prevention measures, and emergency procedures. • Ensure that staff are familiar with the location and operation of fire alarm systems, firefighting equipment, and emergency exits.
		Availability and Training on Fire Extinguishers	• Install fire extinguishers at strategic locations throughout the resort and ensure that they are easily accessible and properly maintained.

Managed environmental impact	Source of impact	Mitigation Measures	Management Action
	• Storage (including fuel)		• Provide training to staff on the proper use of fire extinguishers and when to initiate firefighting measures in case of a fire emergency.
		Electrical Safety Checks	• Conduct regular inspections and maintenance of electrical systems, wiring, and equipment to identify and address potential fire hazards. • Ensure that electrical installations comply with safety standards and regulations to prevent electrical fires.
		Designated Smoking Area	• Designate specific smoking areas with proper receptacles and ashtrays to contain and minimize the risk of accidental fires caused by discarded cigarette butts or smoking materials
		Clear Exit Routes	• Maintain clear and unobstructed exit routes and emergency exits throughout the resort premises to facilitate safe evacuation in the event of a fire. • Display illuminated exit signs and directional arrows to guide guests and staff to the nearest exits during emergencies.
		Safe Storage Practices	• Store hazardous materials in designated storage areas equipped with proper ventilation, fire-resistant containers, and spill containment measures.
		Legal Requirements and Additional Measures	• Ensure compliance with Myanmar fire Brigade regulations, building codes, and legal requirements applicable to fire prevention and emergency preparedness.

6.4 Environmental Monitoring Programme

Environmental monitoring programs 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. The following table is the proposed monitoring plan for the construction and operation of Taung Thaman Thitsar Resort.

Environmental monitoring plan for the construction

Category	Item	Location	Frequency	Resposible Organization
Air Quality (the results will compare with NEQEG)	NO_2, SO_2, PM_{10}, $PM_{2.5}$, O_3, CO	Adjacent to the construction site within the project confines. (21° 53' 5.83" N, 96° 03' 50.36" E)	Bi-annually	Project Proponent
Ground Water Quality (the results will compare with NDWQS and baseline results)	Total Coliforms, Fecal Coliforms, Color, Turbidity, Arsenic, Lead, Nitrate, Manganese, Chloride, Hardness, Iron, pH, Sulphate, Total Dissolved Solids	Groundwater Origins within the Project Area 21° 53' 16.98" N 96° 03' 46.4" E	Once per year	Project Proponent
Wastewater (the results will compare with NEQEG and baseline results)	BOD, COD, Oil and Grease, pH, Total Coliform Bacteria, Total Nitrogen, Total Phosphorus, Total	Treated wastewater discharge outlet (21° 53' 7.12" N , 96° 03' 44.08" E)	Quarterly per year	Project Proponent

	Suspended Solids			
Waste	Amount and kind of construction waste	Every disposal Area within project.	Monthly	Project Proponent
Noise and VIbration	dBA and Vibraion meter	Adjacent to the construction site within the project confines. (21° 53' 5.83" N, 96° 03' 50.36" E)	Once per year	Project Proponent
Occupational Health and Safery	Record of accidents and infectious diseases	Work site and office	Monthly	Project Proponent
Community Health and Safety	Record of accidents and infectious diseases related to the community.	Around the project area	Monthly	Project Proponent

Environmental monitoring plan for the construction

Category	Item	Location	Frequency	Resposible Organization
Air Quality (the results will compare with NEQEG)	NO_2, SO_2, PM_{10}, $PM_{2.5}$, O_3, CO	Core Location within the Project Premises. (21° 53' 15.93" N 96° 03' 45.08" E)	Once per year	Project Proponent
Ground Water Quality (the results will compare with NDWQS and baseline results)	Total Coliforms, Fecal Coliforms, Color, Turbidity, Arsenic, Lead, Nitrate, Manganese, Chloride, Hardness, Iron,	Groundwater Origins within the Project Area. 21° 53' 16.98" N 96° 03' 46.4" E	Bi-annually	Project Proponent

Category	Item	Location	Frequency	Resposible Organization
	pH, Sulphate, Total Dissolved Solids			
Final Discharge Wastewater (the results will compare with NEQEG)	BOD, COD, Oil and Grease, pH, Total Coliform Bacteria, Total Nitrogen, Total Phosphorus, Total Suspended Solids	Wastewater intake point prior to discharge into Taung Thaman Lake (21° 53’ 7.12” N , 96° 03’ 44.08” E)	Quarterly per year	Project Proponent
Surface Water Quality (this result will be compared with the baseline data when EIA study)	BOD, COD, Oil and Grease, pH, Total Coliform Bacteria, Total Nitrogen, Total Phosphorus, Total Suspended Solids	Water body near the discharge outlet of the project. (21° 53’ 7.12” N , 96° 03’ 44.08” E)	Bi-annually	Project Proponent
Waste	Volume of non-hazardous and hazardous waste handled.	Each waste disposal site within the project.	Monthly	Project Proponent
Noise and VIbration	dBA and Vibraion meter	Core Location within the Project Premises (21° 53’ 15.93” N 96° 03’ 45.08” E)	Once a year	Project Proponent
Occupational Health and Safery	Record of accidents and infectious diseases.	Perimeter of the project site.	Monthly	Project Proponent
Training and skills development	The implementation status for CSR activities such as community	Perimeter of the project site.	Once a year	Project Proponent

Category	Item	Location	Frequency	Resposible Organization
	support program.			
Fire Safery and Emergency	Fire Extinguishers and their accessibility, Emergency Lighting, Emergency exit routes and signage, Maintenance and inspection records for fire safety equipment.	Every element in the project domain.	Monthly	Project Proponent
Grievance Mechanism	Responsiveness and timeliness of grievance handling, Confidentiality and privacy protections for those submitting grievances, Transparency in the grievance process and outcomes.	Feedback collection point	Monthly	Project Proponent

Budget for Environmental Monitoring Plan

No.	Item	Budget (USD) per year	
		During Construction	During Operation
1.	Air Quality	1,200/	700/
2.	Water Body (Including Ground water, wastewater and surface water)	600/	1,000/

3.	Waste	500/	1,500/
4.	Noise and Vibration	300	300/
5.	Occupational Health and Safety	3,000/	1,000/
6.	Community Health and Safety	1,500/	1,000/
7.	Fire Safety and Emergency	1,000/	600/
8.	Training and Skills development	2,000/	2,000/

6.5 Sub-Plans

6.5.1 Occupational Safety and Health Plan

Occupational health and safety issues are associated with the construction of the project. Proponent and its construction contractor are obliged to implement all reasonable precautions to protect the health and safety of workers. This plan provides guidance and examples of reasonable precautions to implement in managing principal risks to occupational health and safety. The focus is placed on the construction and decommissioning activities of the project. The detailed plan is provided in the appendix of the EIA report.

6.5.2 Emergency Response Plan

The purpose of this plan is to establish the resort preparedness and response actions related to the potential natural and man-made emergency situations. It is also to ensure that all level of resort's management, employees and the guests have definitive ways to approach emergencies in order to reduce the risks and damaged caused by the incidents. The detailed plan is provided in the appendix of the EIA report.

6.5.3 Grievance Redress Mechanism

A grievance is a concern or complaint raised by an individual or a group within communities affected by the company operations. For the Taung Thaman Thitsar Resort, it can be either from company's own employees, affected communities or even visitors to our resort. The company will adopt the good practice to respond to communities' feedback through relevant channels such as disclosure, consultation and invitation to participate in project monitoring system. The detailed process of mechanism is provided in the appendix of the EIA report.

7. Public Consultation and Information Disclosure

7.1 First Public Consultation Meeting

First public meeting for releasing project information to general public requesting their comments and suggestions on the project was carried out on May 23rd, 2015 at Ywar Thit village. There were about 88 people from local community, representatives from the project and representative from OSHE Services attended the public meeting and participated in open discussion.

Discussions of the local people in the meeting could be summarized as follows;

1. Asked how the company will take the responsibility for the destruction of village road by the heavy machinery from the project.
2. Requested to carry out maintenance work for the village road between Nwar-noe Taw Su and Taung Thaman villages.
3. Requested to help the local community for a systematic garbage management system
4. Requested to practice road safety works.
5. Requested to prevent dust and particulate emission from vehicles
6. Suggested to consider not to degrade the local village roads
7. Asked how the project will provide aid for the development of the local community

Representative from the project discussed as follows;

1. Destruction of village roads could occur by the over loaded vehicles
2. The company will carry out upgrading works for the village roads
3. Local communities will be consulted for every such upgrade work
4. Proponent will coordinate with MCDC for the systematic solid waste management of local community
5. The project will also carry out a systematic solid waste management programs
6. Supervision of road safety such as speed limitation will be practice
7. The project will participate in the works for the development of local community such as electricity and road infrastructure
8. Measure for the control of dust and particulate emission will be studied and implemented.
9. A special team will be organized to carry out the local community development programs

7.2 Second Public Consultation Meeting

Second public meeting for releasing ESIA study results to general public requesting their comments and suggestions was carried out on September 20th, 2015 at the same venue. There were about 173 people from local community, representatives from the project and representative

from OSHE Services Company Limited attended the public meeting and participated in open discussion.

Discussions in the second public meeting are:

1. Requested to provide access road for the two water wells used by Taung Thaman Village
2. Requested to provide access road to cross the earth wall built by the project
3. Requested to provide a thicker chipping pavement layer for the road built by the project as it is currently a bit thinner
4. Requested to pave the road at the junction with the express way
5. Requested to supervise careless drivers for the safety of children
6. Requested to practice dust and particulate control measure such as covering the dump truck and spraying the road with water

Prohibit the vehicle of the project from using the village roads as the project did not take care for the degradation of the road.

1 INTRODUCTION

1.1 Project Background

The proposed project aims to support the development of Myanmar tourism, showcase Myanmar rural culture, and create a place for public recreation. The project includes inner – roads, shop houses, low-rise commercial buildings, hotels, banquet halls and a conference center, parks, playground, court yard, bank, shopping mall, tourism service center, and sales office. The project will be implemented on 40.27 acres of granted land and the project location is U Paing no. 99, 100, 103/1, 103/2. 104, 105, 134/1, 135, 138/1, 138/2, 139, 150/2, 152/1, 152/2, 153/1, Taung Thaman plot no. (592), Taung Thaman villagetract, Amarapura Township, Mandalay District, Mandalay Region.

The proposed project has been submitted to the Myanmar Investment Commission (MIC) by the company regarding permission to carry out the project. The proposed project has received approval to carry out the project with the letter no.– 072/2018, dated 27-03-2018 to from MIC. Moreover, the proposed project has been submitted to the Ministry of Hotels and Tourism for permission to construct hotels. The Ministry issued its decision on July 30, following the resolution of the 2015 meeting. Permission was granted through Letter No.18-GaNge (Adminstration)/ NPT/2501 dated August 7, 2015, which outlines the regulations and guidelines to be adhered to. (the permissions from the relevant governmental agencies are attached in appendix I)

Taung Thaman lake is located in Amarapura near Mandalay, Myanmar. The famous U Bein Bridge spans across this lake and one of the best places in Amarapura. Taung Thaman is the area where human beings have been living since the prehistoric period. Being located beside the bank of Taung Thaman lake, Taung Thaman is the sanitary and pleasantess village and even the foreigners had once recorded its pleasant and beauty. During the Amarapura period, peace and stability had prevailed in Taung Thaman village as it was situated adjacent to the royal city. Having sufficient cultivated lands for livelihood, abundant water and good soil, it was the area with thriving economy.

The Environmental Conservation Department, as the primary authority responsible for assessing and regulating environmental impact, plays a vital role in this process. The Environmental Conservation Department has been instructed by letter no EIA-1/7 (827 (d) / 2016) dated 7-10-2016 to carry out Environmental Impact Assessment for the proposed project.

The project had carried out scoping by OSHE services Company Limited. The study was performed in accordance with the Environmental Conservation Law (2012), Environmental

Conservation Rules (2014) and EIA Procedures (2015) and had received the scoping report approved by letter no. EIA-1/3/approve (SR) (603/2022) dated 07-04-2022 from the Environmental Conservation Department (Head office) and letter no. 2/ 6/ 7 EIA 274/ 2022 dated 03-05-2022 from the Environmental Conservation Department, Mandalay Region. Once the approval notification was received, the environmental impact assessment process was continued according to the regulations in this approval notification and EIA procedure.

Environmental Conservation Department will review the EIA provided by the project proponent, examining factors such as potential impact including environmental aspects, socio-economic aspects. The department will also evaluate the proposed mitigation measures put forth by the project proponents to ensure their adequacy in protecting the environment. The ECD's comments on the EIA will carry significant weight in determining the fate of the project. If the department identifies substantial environmental risks or inadequate mitigation measures, they may recommend modifications. Conversely, if the report indicates that the project can proceed without significant harm to the environment, the ECD may provide its consent with certain conditions.

1.2 A Brief of Project Information

The name of project, the information of the project proponent, organizational structures and project information is provided below. This includes the contact address, phone number, position and responsibilities of the proposed project are also listed.

Table 1. 1 Project Information

Sr.	Particular	Information
1.	Project Name	Taung Thaman Resort
2.	Project Location	U Paing no. 99, 100, 103/1, 103/2. 104, 105, 134/1, 135, 138/1, 138/2, 139, 150/2, 152/1, 152/2, 153/1, Taung Thaman plot no. (592), Taung Thaman villagetract, Amarapura Township, Mandalay District, Mandalay Region. Latitude – 21.879912 N to 21.887610 N Longitude – 96.062167 E to 96.066218 E
3.	Project Area	About (40.27) acre
4.	Type of the Project	Resort (including shop house, low-rise commercial buildings, hotels, banquet halls and a conference center, parks, playground, court yard, bank, shopping mall, tourism service center.)
5.	Project Proponent	U Kyaw Myint (Managing Director)

6.	Organization	Taung Thaman Thit Sar Compnay Limited
7.	Type of Organization	Private Company
7	Investment Period	50 years
8.	Type of Investment	Myanmar Citizen Investor
9.	Amouts of Investment	32,388.95 million (Kyats)

Table 1. 2 Contact Information Proposed Project

No.	Particular	Information
1.	Name	U Kyaw Myint
2.	Roles	Managing Director
3.	Address	Ywar Thit Village, Group of Ou Yin Taw Village, Amarapura Tsp; Mandalay Region.
4.	Email	taungthamanthitsaroffice@gmail.com
5.	Phone	09-798899999
6.	**Name**	**U Kyaw Swar Win**
7.	Roles	Senior Executive
8.	Address	Ywar Thit Village, Group of Ou Yin Taw Village, Amarapura Tsp; Mandalay Region.
9.	Email	kyawswarwinoffice@gmail.com
10	Phone	09 – 792743218

1.3 Organization

Thaung Thaman Thitsar Compnay Limited will carry out the activities as described below with an organization chart and the list of executive members is provided at the table 1.3.

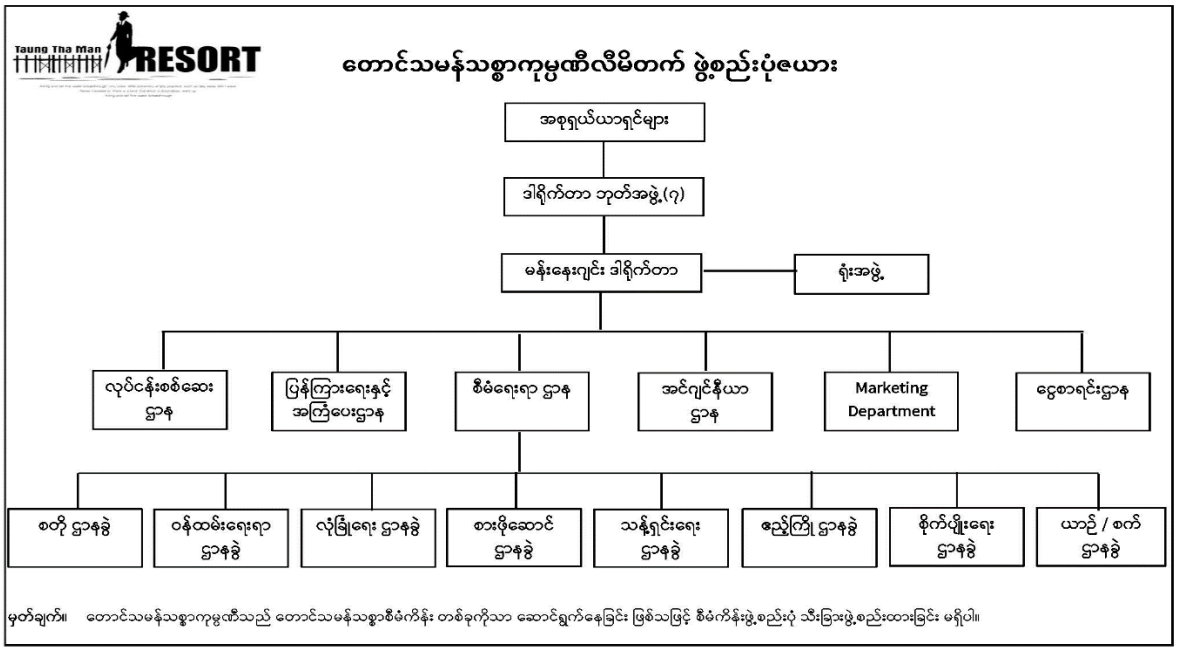


Figure 1. 1 Organization Chart of Taung Thaman Thitsar Co., Ltd.

Table 1. 3 List of Executive Members

No.	Name	Citizen	Roles
1.	U Kyaw Myint	Myanmar	Managing Director
2.	U Than Tun	Myanmar	Director
3.	U Soe Lwin	Myanmar	Director
4.	U Kyaw Htay	Myanmar	Director
5.	DAW Khin Aye Nwe	Myanmar	Director
6.	U Aung Zaw Win	Myanmar	Director
7.	Daw Yan In Nyo	Myanamr	Director

1.4 Objectives of the Study

The aim of Environmental and Social Impact Assessment (ESIA) for Taung Thaman Lake Resort 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.

ESIA study for Taung Thaman Lake Resort project is performed by OSHE services company limited 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.

1.5 Scope of the Study

The ESIA study focusing the project area and its vicinity includes Taung Thaman village, Nwar-noe Taw Su village, Ywar Thit village and Tae Nan Thar village. General study scope of ESIA 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 ESIA to which extent
- Public participation – acquiring public comments, suggestions and input for the project by means of public meetings and consultation works;
- Household survey – carrying out a systematic socioeconomic data survey;
- 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.

1.6 Environmental and Social Study Team

OSHE Services Company Limited will be the third party for ESIA study and reporting for "Taung Thaman Resort" project which is implementing by Taung Thaman Thit Sar Company Limited. OSHE Services Company Limited will perform all ESIA and reporting works by collaborating with subject matter expert teams.

This Environmental Impact Assessment report has been done with resonable skills, care and diligence in accordance with the stipulations of Environmental Impact Assessment Procedure (Paragraph 63).

Table 1. 4 Environmental and Social Study Team

Sr.	Name	Expertise Area
1	U Soe Myint (Team Leader)	Project Management, Socio-Economy & OSH
2	U Yan Naing Aung	Waste Management, Impact Assessment & Mitigation Plan
3	U Khin Maung Maung	Construction Project Analysis & Urban Planning
4	U Khin Maung Htaey, U Yan Naing Aung	Water Sanitation and Wastewater Management
5	U Hla Baw	Water Resources Analysis

6	U Kyaw Zin Lat U Hla Myo Aung	Geological Assessment
7	Daw Htay Htay Win	Soil Assessment
8	Dr. Myo Myint Dr. Zaw Khaing Oo Dr. ReeMon Htun	Biodiversity Assessment
9	Dr. Aung Lay Tin , U Myint Maung Maung Than	Noise & Vibration Air Quality Assessment
10	Dr. Than Htay Oo Dr. Maung Maung Hlaing	Cultural Heritage Impact Assessment
11	Dr. Htin Lin Dr. Aye Hnin Hnin Naing	Traffic Impact Analysis
12	U Lin Thura Aung	Pollution Control Scoping & ToR Drafting, Report Drafing
13	U Soe Myint Dr. Thura Kyaw	Public Consultation & Social Survey
14	U Aung Kyaw Lin	Legal Analysis
15	Dr. Myo Nyunt U Yan Naing Aung U Thet Paing Zaw U Linn Thura Aung	Impact Assessment, Mitigation Measures & Environmental Management Plan
16	U Ye Yint U Wai Yan	Monitoring Schedules, Budgetting, and Report Drafting

Table 1. 5 Contact information of OSHE Services Co.,Ltd.

Sr.	**Name**	**Position**	**Email and Phone Number**
1.	U Soe Myint	Executive Director	sm260859new@gmail.com 09401600255
2.	U Yan Naing Aung	General Manager	yannaingaung123@gmail.com 09797508797

2 POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

This chapter describes the policy of the Taung Thaman Thitsar Co.ltd, objectives of implementation of this project, law, rules and regulation, guidelines and procedures which are related to the project and commitment of proposed project. Moreover, the institutional framework are also listed.

2.1 Objectives of Implementation of Taung Thama Resort

Taung Thaman Lake is located in Amarapura, near Mandalay, Myanmar. The famous U-Bein Bridge spans across this lake and is one of the best places in Amarapura. The objectives of the implementation of this project are –

- to create an international resort for tourists, travelers, and local visitors,
- to expose Myanmar's cultural heritage, and
- to provide a good service place for local people to relax.
- Helping to generate foreign income and
- To improve the standards of living.

2.2 Policy of Taung Thaman Thitsar Co., Ltd.

Taung Thaman Thitsar Company Limited is committed to conducting business ethically, responsibly, and in compliance with all applicable laws and regulations. This policy outlines our commitment to our employees, customers, stakeholders, and the communities in which we operate.

1. Ethical Conduct:

- Conduct all business activities with the highest standards of ethics and integrity.

- Avoid conflicts of interest and act in the best interests of the company and its stakeholders.

2. Compliance:

- Adhere to all relevant local, national, and international laws and regulations.

- Regularly review and update policies to ensure ongoing compliance.

3. Equal Opportunity:

- Provide equal employment opportunities based on merit and qualifications.

- Prohibit discrimination on the basis of race, color, religion, gender, sexual orientation, age, or disability.

4. Health and Safety:

- Prioritize the health and safety of employees, visitors, and the public.
- Implement measures to prevent accidents, injuries, and work-related illnesses.

5. Environmental Responsibility:

- Minimize our environmental impact by adopting sustainable practices.
- Contribute to environmental conservation efforts and promote responsible resource management.

6. Customer Satisfaction:

- Strive for excellence in products and services to meet or exceed customer expectations.
- Address customer concerns promptly and seek continuous improvement.

7. Employee Development:

- Invest in the professional development and well-being of our employees.
- Foster a positive work environment that encourages growth, creativity, and collaboration.

8. Information Security:

- Safeguard sensitive company and customer information through secure practices.
- Implement measures to protect against unauthorized access or data breaches.

9. Community Engagement:

- Actively engage with and support the communities in which we operate.
- Contribute to social initiatives that align with our values and principles.

10. Continuous Improvement:

- Regularly review and assess company policies and procedures for effectiveness.
- Encourage employee feedback and engagement in the ongoing improvement process.

By following this company policy, Taung Thaman Thitsar Company Limited aims to build trust, foster positive relationships, and contribute to the well-being of our employees and the communities we serve.

2.3 Governmental Policy Framework

2.3.1 Responsible Tourism Policy (2012)

Myanmar's Responsible Tourism Policy was published in 2012, focusing on 'maximizing economic, social and environmental benefits and minimizing costs to destinations', with economic growth, environmental sustainability and social justice as the three approaches to achieve sustainable development. "We intend to use tourism to make Myanmar a better place to live in – to provide more employment and greater business opportunities for all our people, to contribute to the conservation of our natural and cultural heritage and to share with us our rich cultural diversity. We warmly welcome those who appreciate and enjoy our heritage, our way of life and who travel with respect". (Responsible Tourism Policy 2012, page 6)

2.3.2 Myanmar Ecotourism Policy (2015)

MoNREC and MoHT collaboratively passed Myanmar's Ecotourism Policy in 2015, with focus on the relationship between tourism and protected areas. This is particularly pertinent to Tanintharyi, who officially gazette Myanmar's first Marine National Park in the Lampi islands. The Ecotourism Policy highlights that tourism-related activities in and around protected areas must be managed according to systems and processes that deliver:

1. Biodiversity and ecosystems conservation,
2. Education and learning to enable hosts and visitors to understand and engage with management approaches to protect and conserve the natural and cultural assets of these areas;
3. Economic and social benefits to communities in and around protected areas
    - Reduce and eliminate unsustainable practices, and
    - Engage collaborative approaches to protected area management.

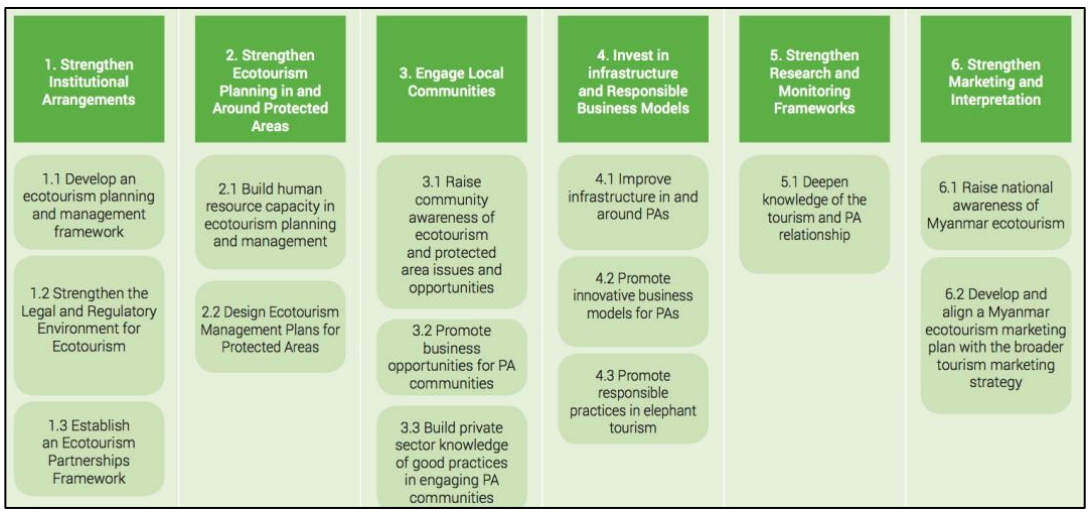


Figure 2. 1 Ecotourism Policy: Strategic programs and key objectives

2.3.3 National Environmental Policy of Myanmar (2019)

This Policy builds on Myanmar's 1994 National Environment Policy and reaffirms its core values:

a. The wealth of the nation is its people, its cultural heritage, its environment and its natural resources.
b. It is the responsibility of the State and every citizen to preserve our natural resources in the interests of present and future generations.
c. Environmental protection should always be the primary objective in seeking development.

It also builds on the 1997 Myanmar Agenda 21, the 2009 National Sustainable Development Strategy. It is grounded in the environmental responsibilities in the 2008 Constitution of the Republic of the Union of Myanmar, and the obligations contained in the 2012 Environmental Conservation Law. It also aligns with, and expands upon, the environmental considerations in the 2015 National Comprehensive Development Plan and the 2018 Myanmar Sustainable Development Plan. The Policy recognises and integrates Myanmar's commitments to Multilateral Environmental Agreements, including the 2015 Paris Agreement.

This National Environmental Policy will serve as a guide in mapping out detailed action plans for environmental protection and sustainable development, and set the direction for the on-going implementation and enhancement of relevant laws and policies. Further it will establish a foundation for mainstreaming environmental considerations into decision-making on economic and social development and activities by:

a. conceiving a long-term vision for environmental protection and sustainable development, supported by key national environmental policy principles;
b. providing a framework for incorporating environmental protection and sustainable development into all relevant sectoral policies; and
c. setting a basis for enhancing environmental governance in Myanmar.

Table 2. 1 National Environmental Policy- Vision and Mission

National Environmental Policy Vision & Mission	
Vision	A Clean environment, with healthy and functioning ecosystems, that ensures inclusive development and wellbeing for all people in Myanmar.
Mission	To establish national environmental policy principles for guiding environmental protection and sustainable development and for mainstreaming environmental considering into all policies, laws, regulations, plans, strategies, programmes and projects in Myanmar.

Source: i National Environmental Policy of Myanmar

To pursue this vision, the Government of the Republic of the Union of Myanmar adopts the following 23 National Environmental Policy principles as the guiding framework for achieving: a clean environment and healthy, functioning ecosystems; sustainable economic and social development; and the mainstreaming of environmental protection and management.

2.4 Government Legal Framework

The proposed project will be conducted in compliance with all relevant Union Laws, Regional law and regulations entacted by the state related to the project. The Laws and regluation to be complianced and followed by the Taung Thaman Thitsar Company Limited are summarized as follows and detailed in Table 2.1.

1. Environmental Conservation Law (2012)
2. Environmental Conservation Rules (2014)
3. Environmental Impact Assessment Procedures (2015)
4. National Environmental Quality (Emission) Guideline (2015)
5. Myanmar Investment Law (2016)
6. Myanmar Investment Rules (2017)
7. The Electricity Law (2014)
8. The Export and Import Law (2017)
9. Factories Act (1951) (Amended 2016)
10. Myanmar Engineering Council Law (2013)
11. Myanmar Fire Brigade Law (2015)
12. Automobile Law (2015)
13. The Underground Water Act (1930), and Underground Water Rule (1941)
14. The Conservation of Water Resources and Rivers Law (2006)
15. Forest Law (2018)
16. The Private Industrial Enterprise Law (1990)
17. The Insurance Business Law (1996)
18. The Petroleum and Petroleum Product Law (2017)
19. Prevention of Hazard from Chemical and Related Substances Law (2013)
20. Public Health Law (1972)
21. The Law Amending the Prevention and Control of Communicable Diseases Law (2011)

22. The Control of Smoking and Consumption of Tobacco Product Law (2006)
23. Occupational Safety and Health Law (2019)
24. The Labor Organization Law (2011)
25. The settlement of Labor Dispute Law (2012)
26. Employment and Skill Development Law (2013)
27. Minimum Wages Law (2013)
28. The Payment of Wages Law (2016)
29. The Social Security Law (2012)
30. The Workmen's Compensation Act (1924, Amended 2005)
31. The Leave and Holiday Act (1951,Amended 2014)
32. The Ethnic Rights Protection Law (2015)
33. The Protection and Preservation of Cultural Heritage Regions Law (1998)
34. The Protection and Preservation of Antique Objects Law (2015)
35. The Protection and Preservation of Ancient Monuments Law (2015)
36. The Protection of Wildlife and Protected Areas Law (1994)

Table 2. 2 Commitment of the enacted law and rules by Taung Thaman Thitsar Co.,Ltd.

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
Para-	**The Environmental Conservation Law (2012)**
7 (o)	Taung Thaman Thitsar Co., Ltd. makes a commitment to managing if the project makes pollution to compensate for environmental impact, cause to contribute fund by the organizations which obtain benefit from the natural environmental service system, cause to contribute a part of the benefit from the businesses which explore, trade and use the natural resources in environmental conservation works;
14	Taung Thaman Thitsar Co., Ltd. makes a commitment to treat, emit, discharge and deposit the substances which cause pollution in the environment in accord with stipulated environmental quality standards.
15.	Taung Thaman Thitsar Co., Ltd. makes a commitment, material or place which causes a point source of pollution will 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 will be arranged to dispose the wastes in accord with environmentally sound methods.

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
22.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the requirement that, as the owner or occupier of a business, worksite, or factory workshop falling under the category stipulated by the Ministry under section 21, Taung Thaman Thitsar Co., Ltd. shall apply for prior permission to the Ministry in accordance with the stipulations.
24.	Taung Thaman Thitsar Co., Ltd. makes a commitment to fully cooperate to be conducted inspection whether or not it is performed in conformity with such terms and conditions by Ministry according to issuing the prior permission, stipulate terms and conditions relating to environmental conservation or inform the relevant Government departments, Government organizations to carry out inspections.
26.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the requirement that, as the holder of prior permission for its business, worksite, or factory workshop, Taung Thaman Thitsar Co., Ltd. shall effect insurance according to the category of its operations for any accidents that may cause an impact on the environment, in accordance with existing law.
28.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the requirement that no one shall operate a business, work-site, or factory workshop without prior permission if such permission is required under this Law.
29.	Taung Thaman Thitsar Co., Ltd. makes a commitment not to violate any prohibition contained in the rules, notifications, orders, directives and procedures issued under this Law.
30.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the requirement that, without permission from the Ministry, no one shall import, export, produce, store, carry, or trade any material that causes an impact on the environment as prohibited by the Ministry.
Para-	**The Environmental Conservation Rules (2014)**
69.	(a) Taung Thaman Thitsar Co., Ltd. makes a commitment that it shall not emit, cause to emit, dispose, cause to dispose, pile, or cause to pile, by any means, the pollutants and the hazardous waste or hazardous material stipulated by notification under the Law and any of these rules at any place that may affect the public directly or indirectly.

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	(b) Taung Thaman Thitsar Co., Ltd. makes a commitment not carry out to damage the ecosystem and the natural environment which is changing due to such system, except for carrying out with the permission of the Ministry for the interest of the people.
Para-	**The Environmental Impact Assessment Procedures (2015)**
3.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the requirements stipulated in Section 21 of the Law and Articles 52, 53, and 55 of the Rules regarding projects and project expansions. Taung Thaman Thitsar Co., Ltd. understands that all projects and expansions undertaken by various entities, including ministries, government departments, organizations, corporations, boards, development committees, local governments, companies, cooperatives, institutions, enterprises, firms, partnerships, or individuals, which may cause adverse impacts on environmental quality, are required to undertake Initial Environmental Examination (IEE) or Environmental Impact Assessment (EIA), or to develop an Environmental Management Plan (EMP), and to obtain an Environmental Compliance Certificate (ECC) in accordance with the specified procedure.
84.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the obligations outlined for all projects and activities, regardless of their categorization in Annex 1 'Categorization of Economic Activities for Assessment Purposes,' as requiring an Initial Environmental Examination (IEE), an Environmental Impact Assessment (EIA), or neither: (i) Taung Thaman Thitsar Co., Ltd. understands that it is obliged to obtain all required authorizations, permits, licenses, and approvals, and to comply with all applicable laws, regulations, procedures, ministerial directives, zoning, planning requirements, and other governmental requirements. (ii) Taung Thaman Thitsar Co., Ltd. acknowledges that its projects and activities shall remain subject to any environmental and/or social conditions imposed by the Ministry as a condition for the commencement or continuation of construction or operation.
87.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the requirement that upon receipt of the written approval from the relevant authority, Taung Thaman Thitsar Co., Ltd., as the Project Proponent, shall commence implementation of the Project strictly in accordance with the conditions attached to the Environmental

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	Compliance Certificate (ECC) and including the Environmental Management Plan (EMP), within the time prescribed by the Ministry.
102.	Taung Thaman Thitsar Co., Ltd. makes a commitment to bear full legal and financial responsibility for: a. all of the Project'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 would 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.
103.	Taung Thaman Thitsar Co., Ltd. makes a commitment to 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.
104.	Taung Thaman Thitsar Co., Ltd. makes a commitment 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.
105.	Taung Thaman Thitsar Co., Ltd. makes a commitment to timely notify and identify in writing to the Ministry, providing detailed information as to the proposed Project's potential Adverse Impacts.
106.	Taung Thaman Thitsar Co., Ltd. makes a commitment, 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.
107.	Taung Thaman Thitsar Co., Ltd. makes a commitment 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

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	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.
108.	Taung Thaman Thitsar Co., Ltd. makes a commitment 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.
109.	Taung Thaman Thitsar Co., Ltd. makes a commitment to submit monitoring reports which will be included: a. documentation of compliance with all conditions; b. progress made to date on implementation of the EMP against the submitted implementation schedule; c. difficulties encountered in implementing the EMP and recommendations for remedying those difficulties and steps proposed to prevent or avoid similar future difficulties; d. number and type of non-compliance with the EMP and proposed remedial measures and timelines for completion of remediation; e. accidents or incidents relating to the occupational and community health and safety, and the environment; and monitoring data of environmental parameters and conditions as committed in the EMP or otherwise required.
110	Within ten (10) days of completing a monitoring report as contemplated in Article 108 and Article 109 in accordance with the EMP schedule, Taung Thaman Thitsar Co., Ltd. makes a commitment to make such report (except as may relate to National Security concerns) publicly available on the Project's website, at public meeting places (e.g. libraries, community halls) and at the Project offices. Any organization or person may request a digital copy of a monitoring report and Taung Thaman Thitsar Co., Ltd. would, within ten (10) days of receiving such request, submit a digital copy via email or as may otherwise be agreed upon with the requestor.
113.	For purposes of monitoring and inspection, Taung Thaman Thitsar Co., Ltd. makes a commitment which: a. will 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

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	b. from time to time as and when the Ministry may reasonably require, will 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.
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 Taung Thaman Thitsar Co., Ltd. with all applicable environmental and social requirements, Taung Thaman Thitsar Co., Ltd. makes a commitment to grant full and immediate access to the Ministry at any time as may be required by the Ministry.
117.	Taung Thaman Thitsar Co., Ltd. further ensure that the Ministry's rights of access hereunder shall extend to access by the Ministry to the Project's contractors and subcontractors.
Para	**National Environmental Quality (Emission) Guidelines (2015)**
6.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to ensuring that the provisions of the general and applicable industry-specific guidelines are reflected in the project's Environmental Management Plan (EMP) and Environmental Compliance Certificate (ECC). Taung Thaman Thitsar Co., Ltd. understands that these documents constitute the project's commitment to taking necessary measures to avoid, minimize, and control adverse impacts to human health and safety, as well as the environment. Taung Thaman Thitsar Co., Ltd. is dedicated to: Reducing the total amount of emissions generation. Adopting process modifications, including waste minimization, to lower the load of pollutants requiring treatment. Applying treatment techniques, as necessary, to further reduce the load of contaminants prior to release or discharge. Taung Thaman Thitsar Co., Ltd. is committed to implementing these measures as outlined in the EMP and ECC, in alignment with the general and industry-specific guidelines.
7.	Taung Thaman Thitsar Co., Ltd. commits to adhering to environmental guidelines aimed at preventing pollution by reducing the mass of pollutants emitted into the environment. Taung Thaman Thitsar Co., Ltd. understands that dilution of air emissions and effluents to achieve maximum permitted values is unacceptable. Taung Thaman Thitsar Co., Ltd. will strive to achieve specified guideline values

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	without dilution at least 95 percent of the time during project operation, calculated as a proportion of annual operating hours.
9.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to using, complying with, and referring to applicable national guidelines, standards, or international standards adopted by the Ministry, as specified in the Environmental Impact Assessment (EIA) Procedure. Taung Thaman Thitsar Co., Ltd. understands that these guidelines will be applied by the Ministry to meet this requirement until they are modified or succeeded by other guidelines or standards.
12.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to engaging in continuous, proactive, and comprehensive self-monitoring of our projects as specified in the Environmental Impact Assessment (EIA) Procedure. Taung Thaman Thitsar Co., Ltd. understands the importance of complying with applicable guidelines and standards throughout the project lifecycle. For the purposes of these guidelines, Taung Thaman Thitsar Co., Ltd. accepts responsibility for monitoring compliance with general and applicable industry-specific guidelines specified in the project's Environmental Management Plan (EMP) and Environmental Compliance Certificate (ECC).
13.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to sampling and measuring air emissions, noise, odor, and liquid/effluent discharges at points of compliance as specified in the project's Environmental Management Plan (EMP) and Environmental Compliance Certificate (ECC).
Para	**The Myanmar Tourism Law (2018)**
14.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the responsibilities outlined for operating a tourism business in Myanmar. Taung Thaman Thitsar Co., Ltd. recognizes that it has the responsibility to: (a) operate in a responsible and sustainable manner; (b) respect Myanmar cultural heritage, customs and traditions, and conserve the natural environment; (c) abide by the provisions of this Law, rules, notifications, orders and directives issued by this Law; (d) ensure the fundamental health, security and safety of tourists; (e) protect the privacy and personal data of tourists; (f) pay taxes and fees to the relevant departments in accordance with the existing laws;

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	(g) abide by terms and conditions of the license.
Para	**Myanmar Investment Law (2016)**
50.	(a) Taung Thaman Thitsar Co., Ltd. pledge to apply for the necessary permit or endorsement and comply under this Law has the right to obtain a long-term lease of land or building from the owner if it is private land or building, or from the relevant government departments or government organization if it is land managed by the government, or land or building owned by the Union in accordance with the stipulations in order to do investment. Citizen investors may invest in their own land or building in accordance with relevant laws. (d) Taung Thaman Thitsar Co., Ltd. makes a commitment to register the land lease contract at the Office of Registry of Deeds in accordance with the Registration Act.
51.	Taung Thaman Thitsar Co., Ltd. commits to the following: (a) may appoint of any citizen who is a qualified person as senior manager, technical and operational expert, and advisor in his investment within the Union in accordance with the Laws; (b) shall appoint them to replace, after providing for capacity building programs in order to be able to appoint citizens to different level positions of management, technical and operational experts, and advisors; (c) shall appoint only citizens for works which does not require skill; (d) shall appoint skilled citizen and foreign workers, technicians, and staff by signing an employment contract between employer and employee in accordance with the labor laws and rules; (e) shall ensure to obtain the entitlements and rights in the labor laws and rules, including minimum wages and salary, leave, holiday, overtime fee, damages, compensation of the workman, social welfare, and other insurance relating to workers in stipulating the rights and duties of employers and employees and occupational terms and conditions in the employment contract; (f) shall settle disputes arising among employers, among workers, between employers and workers, and technicians or staff in the investment in accordance with the applicable laws.
65.	Taung Thaman Thitsar Co., Ltd. commits to the following: (a) shall respect and comply with the customs, traditions and traditional culture of the ethnic groups in the Union;

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	(b) shall establish and register a company or sole proprietorship or legal entities or branches of such entities under the Laws in order to invest; (c) shall abide by the terms and conditions, stipulations of special licenses, permits, and business operation certificates issued to them, including the rules, notifications, orders, and directives and procedures issued by this Law and the applicable laws, terms and conditions of contract and tax obligations; (d) shall carry out in accordance with the stipulations of the relevant department if it is, by the nature of business or by other need, required to obtain any license or permit from the relevant Union Ministries, government departments and government organizations, or to carry out registration; (e) shall immediately inform to the Commission if it is found that natural mineral resources or antique objects and treasure trove are not related to the 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 investor shall continue to carry out the investment in such land, and if not allowed, the investor shall transfer and carry out, by obtaining the permission, at the substituted place which is selected and submitted by him; (f) shall not make any significant alteration of topography or elevation of the land on which he is entitled to lease or to use, without the approval of the Commission; (g) shall abide by 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; (h) shall list and keep proper records of books of account and annual financial statement, and necessary financial matters relating to the investments performed by permit or endorsement in accordance with internationally and locally recognized accounting standards. (i) shall 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;

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	(j) shall 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) shall 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) shall supervise foreign experts, supervisors and their families, who employ in their investment, to abide by the applicable laws, rules, orders and directives, and the culture and traditions of Myanmar; (m) shall respect and comply with the labor laws; (n) shall have the right to sue and to be sued in accordance with the laws; (o) shall pay effective compensation for loss incurred to the victim, if there are 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) shall allow the Commission to inspect in any places, when the Commission informs the prior notice to inspect the investment; (q) shall take in advance permit or 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, and shall submit the situation of environmental and social impact assessment to the Commission along the period of activities of the investments which obtained permit or endorsement of the Commission.
66.	Taung Thaman Thitsar Co., Ltd. hereby commits to adhere to the provisions of the law. Subject to the assessment under section 65 (q), the Commission may administer the investments carried out by Taung Thaman Thitsar Co., Ltd., including the authority to conduct or suspend activities deemed necessary in accordance with the law.
73.	Taung Thaman Thitsar Co., Ltd. commits to comply with the law, ensuring that the investor shall obtain the types of insurance stipulated in the provision of the rules

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	from any insurance enterprise entitled to carry out insurance businesses within the Union.
Para-	**Myanmar Investment Rule (2017)**
7.	Taung Thaman Thitsar Co., Ltd. acknowledges and understands that under subsection (d) of section 36 of the Law, it is not required to apply for a permit in the following circumstances: (a) leasing or receiving a license for the land or building for a term of 5 years or less; (b) sub-leasing such state-owned land or building by the investor from any of the following persons in a manner permitted under lease agreement, agreement or other agreement: (i) a person who has previously obtained the right to use the state-owned land or buildings from the government department and government organization in accordance with the laws of the Union, including the Law; and (ii) a person authorized to sub-lease or sub-license the state-owned land or building in accordance with the approval of the government department and government organization. Taung Thaman Thitsar Co., Ltd. commits to complying with the conditions outlined in subsection (d) of section 36 of the Law when engaging in leasing or sub-leasing arrangements for land or buildings.
28.	Taung Thaman Thitsar Co., Ltd. acknowledges and recognizes that as a person desiring to invest, it has the option to submit an investment screening application to the Commission for non-binding guidance on proposed investments.: (a) businesses required to submit a proposal to the Commission under section 36 of the Law; (b) businesses likely to be submitted to the Pyidaungsu Hluttaw for approval under section 46 of the Law; (c) investment activities restricted under section 42 of the Law and its related notification; (d) investment activities involved in investment promoted sectors; or (e) investment activities prohibited under section 41 of the Law.

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
29.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the requirements outlined for the investment screening application process: (a) fully disclose the nature of the investment; (b) disclose all information which appropriate person may consider in the assessment of the Commission; and (c) right fully disclose information
64.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the following requirements for the investment: a. Taung Thaman Thitsar Co., Ltd. will act, and the investment will be made, in accordance with the laws of the Union. b. The proposal for investment by Taung Thaman Thitsar Co., Ltd. is in accordance with the laws. c. Taung Thaman Thitsar Co., Ltd. has demonstrated a commitment to carry out the investment in a responsible and sustainable manner, including by limiting potentially adverse environmental and social impacts. This commitment encompasses environmental conservation actions, compliance with environmental conservation policies, human rights considerations, and the application of effective technology for natural resources and waste management practices. h. The investment by Taung Thaman Thitsar Co., Ltd. is compatible with national development, security, economic, social, and cultural policies, considering policy objectives announced by the Government or the government of any State or Region affected by the investment.
96	Taung Thaman Thitsar Co., Ltd. acknowledges and agrees to the following provisions regarding investment in multiple zones: (a) If Taung Thaman Thitsar Co., Ltd. invests in more than one zone, the zone in which more than 65% of the value of the investment is invested will be deemed as the location of the investment. (b) if more than 65% of the total value of the investment is invested in: (1) zone 1 and zone 2, the investment shall be deemed to be in zone 2; (2) zone 2 and zone 3, the investment shall be deemed to be in zone 3; and (3) zone 1 and zone 3, the investment shall be deemed to be in zone 3.
113	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the requirement that, before enjoying any tax exemption or relief under sections 75 and 78 of the Law,

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	Taung Thaman Thitsar Co., Ltd. shall apply to the Internal Revenue Department to accept the tax assessment for the relevant assessment year. Taung Thaman Thitsar Co., Ltd. understands the importance of complying with tax assessment procedures as mandated by the Law.
116	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the provision that allows investors who are in the application process or have already obtained the permit or endorsement to submit the land use application for investment.
117.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to including the following facts at least in the land use application as mandated by the regulation. Furthermore, Taung Thaman Thitsar Co., Ltd. understands that the Commission reserves the right to request other necessary facts from the investor to facilitate the evaluation process: a. Taung Thaman Thitsar Co., Ltd. will provide details regarding the area, type, and location of the land or buildings in the land use application. b. Taung Thaman Thitsar Co., Ltd. will furnish information related to the owners of the land or buildings. c. Taung Thaman Thitsar Co., Ltd. will include any recommendations, permissions, or similar documents obtained from the Region or State Government, government departments, or organizations to approve the change of land use for investment purposes. d. Taung Thaman Thitsar Co., Ltd. will specify whether significant alterations of the topography or elevation of the proposed land are required according to subsection (f) of section 65. e. Taung Thaman Thitsar Co., Ltd. will outline the period for the right to use the proposed land. f. Taung Thaman Thitsar Co., Ltd. will provide details of the land or building lease agreements (draft) as part of the land use application.
157	Taung Thaman Thitsar Co., Ltd. acknowledges and recognizes the provision allowing investors to submit an endorsement application to the Commission as well as the Region or State Committee for investments eligible for endorsement issuance under Rule 155.
170.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to delivering notice to the Investment Assistance Committee in the event of grievances or disputes pertaining to the following matters:

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	a. Incorrect decisions made by government departments and organizations regarding the investment. b. Wrongful refusals on applications for permits, licenses, registrations, or approvals by government departments and organizations. c. Actions resulting in the voiding of any legal right, protection, or approval.
190.	Taung Thaman Thitsar Co., Ltd. commits to the following in accordance with section 65(q) of the Law: An Investor to whom section 65(q) of the Law applies shall submit confirmation of its compliance with the applicable requirements of the Environmental Conservation Law, rules, and environmental impact assessment procedures to undertake, obtain, and implement an initial environmental examination, assessment, certificate, and management plan as those requirements are met. The approval of the Commission for the continuation of the Investment shall be based on its compliance.
202.	Taung Thaman Thitsar Co., Ltd. commits to adhere to the specified law: "The investor, Taung Thaman Thitsar Co., Ltd., shall comply with all terms and conditions stated in the permit, as well as other applicable laws, during the execution of the investment."
203.	Taung Thaman Thitsar Co., Ltd. commits to the following in accordance with the specified law: "The investor, Taung Thaman Thitsar Co., Ltd., shall fully assist in the negotiating processes with the relevant government departments and government organizations for the affected persons due to investment plans."
206	Taung Thaman Thitsar Co., Ltd. commits to complying with the law as follows: "If Taung Thaman Thitsar Co., Ltd. desires to appoint an expert foreigner as a senior manager, technical and operational expert, or advisor according to subsection (a) of section 51 of the Law, the company shall submit the application, along with the passport, expertise evidence or degree certificate, and a summary of the biography of such foreigner to the Commission and obtain the necessary approval.
212.	Taung Thaman Thitsar Co., Ltd. commits to the following in accordance with the specified law: "The investor, Taung Thaman Thitsar Co., Ltd., upon obtaining the permit or tax exemption or relief, shall insure the relevant insurance out of the following types

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	of insurance at any insurance business entitled to carry out insurance business within the Union based on the nature of the business: (a) Property and Business Interruption Insurance; (b) Engineering Insurance; (c) Professional Liability Insurance; (d) Bodily Injury Insurance; (e) Marine Insurance; or (f) Workmen Compensation Insurance."
Para-	**The Myanmar Insurance Law (1993)**
15.	Taung Thaman Thitsar Co., Ltd. commits to the following in accordance with the specified law: "The owners of motor vehicles within Taung Thaman Thitsar Co., Ltd. shall affect compulsory Third Party Liability Insurance with Myanmar Insurance, as mandated by the law."
16.	Taung Thaman Thitsar Co., Ltd. solemnly commits to securing the well-being of the public, state-owned property, and the environment. As part of this commitment, we pledge to obtain compulsory General Liability Insurance with Myanmar Insurance, recognizing our responsibility as entrepreneurs or an organization operating an enterprise that may impact public safety, state property, or the environment adversely
Para-	**The Petroleum and Petroleum Product Law (2017)**
8.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the functions outlined by the Ministry concerning any petroleum and petroleum product, including but not limited to: a. Obtaining licenses for refining, transit, transport by pipeline, sale and distribution, inspection, and testing; obtaining joint licenses or compound licenses for carrying out multiple types of business activities; b. Adhering to the procedures and conditions determined by the Ministry related to refining, transit, transport by pipeline, sale and distribution, inspection, and testing.
9.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the functions outlined by the Ministry of Transport and Communications concerning any petroleum and petroleum product, including but not limited to:

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	a. Obtaining licenses for vehicles, vessels, and barges that carry any petroleum and petroleum product; b. Adhering to the procedures and conditions determined by the Ministry for carrying out transport business, excluding transport by pipeline.
10.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the functions outlined by the Ministry of Natural Resources and Environmental Conservation concerning any petroleum and petroleum product, including but not limited to: a. Obtaining licenses for the right to store in storage tanks and warehouses; b. Obtaining transport permits for vehicles, vessels, and barges that shall carry any petroleum and petroleum product d. Taking necessary action, in accordance with existing laws, if environmental impacts occur during the business activities related to petroleum and petroleum products, through on-site inspection; e. Adhering to the procedures and conditions determined, in coordination with ministries concerned, by the Ministry regarding the standard and quality of storage tanks, warehouses, and tanks of vehicles, vessels, and barges that carry any petroleum and petroleum product.
11.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to adhere to the requirement stipulated by law that mandates the expression of danger on all receptacles containing any dangerous petroleum and petroleum product. This expression of danger shall be achieved through stamping, embossing, painting, printing, or any other means. In cases where direct expression is impossible, Taung Thaman Thitsar Co., Ltd. pledges to display warning signs of a similar nature to the danger posed by gasoline, spirit, or petroleum, either in writing at an ostensible place or using salient words or signs near the receptacle.
12.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits that the provisions contained in section 11 shall not apply to the following receptacles: (a) Any glass, stone, or metal receptacle in which the dangerous petroleum is less than two gallons, securely capped; (b) A tank attached to a machine-powered vehicle or machinery that uses any petroleum and petroleum product; (c) A storage tank absolutely buried underground;

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	(d) Any class of receptacles, as notified, exempted from the application of this section by the Ministry.
15.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the requirement that any person desiring to transport or store non-dangerous petroleum and petroleum products locally shall obtain a license if the quantity is more than 500 gallons. However, for storage of 500 gallons and less, Taung Thaman Thitsar Co., Ltd. pledges to use receptacles not exceeding 200 gallons.
16.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the provision that allows any person to store, import, or transport any dangerous petroleum and petroleum product not exceeding six gallons without obtaining a license, provided it is not intended for sale.
17.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to adhere to the provisions outlined in section 16. When desiring to store any dangerous petroleum and petroleum product, Taung Thaman Thitsar Co., Ltd. pledges to store the product in a glass, stone, or metal receptacle with a secure cap. If desiring to store in a glass or stone receptacle, Taung Thaman Thitsar Co., Ltd. will ensure that the volume does not exceed 0.25 gallon. If desiring to store in a metal receptacle, Taung Thaman Thitsar Co., Ltd. will ensure that the volume does not exceed 5 gallons.
30.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to complying with the regulation stipulating that no person shall engage in any business activities or measures necessitating a license under this law without the relevant license.
31.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to adhering to the following obligations as a licensee: Taung Thaman Thitsar Co., Ltd. a. shall not violate any prohibition contained in the rules, regulations, bye-laws, notifications, orders, directives, procedures and conditions or fail the duty to implement; b. shall not use a receptacle and transport vehicles and pipelines that contains any dangerous petroleum and petroleum product without saliently mentioning in writing of warning signs; c. shall not import, transport, store and sell and distribute the dangerous petroleum and petroleum product, or non-dangerous petroleum and petroleum product except by the means stipulated in this law;

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	d. shall not have the right to carry out without undertaking the environmental impacts, in operating petroleum and petroleum product business activities; e. shall not distribute and sell petroleum and petroleum products which do not fulfill or are not in conformity with the standard, quality and measurement
32.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to cooperating fully with authorized officers or organizations when requested to provide assistance, inspect petroleum and petroleum products, receptacles, machine-powered vehicles, machinery, vessels, or pipelines transporting them, and to take samples of petroleum and petroleum products. Taung Thaman Thitsar Co., Ltd. understands the importance of regulatory compliance and transparency in petroleum and petroleum product business activities. Taung Thaman Thitsar Co., Ltd. will not refuse authorized officers or organizations when they request assistance, inspections, or sampling at any place of import, export, storage, refining, sale, distribution, or during transportation of petroleum and petroleum products.
33.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to promptly reporting any explosion or fire resulting from petroleum and petroleum product business activities to the nearest authority concerned. In the event of an explosion or fire, or if there is a risk of fire at or near the location where petroleum and petroleum products are stored, Taung Thaman Thitsar Co., Ltd. will immediately inform the relevant authority and provide all necessary information related to the incident.
Para-	**The Explosive Substances Act (1908)**
3.	Taung Thaman Thitsar Co., Ltd acknowledges and commits to refrain from unlawfully and maliciously causing, attempting to cause, or making and keeping explosive substances with the intent to cause an explosion of a nature likely to endanger life or cause serious injury to property. The company understands that: Any person who unlawfully and maliciously causes, attempts to cause, or makes and keeps by any explosive substance an explosion of a nature likely to endanger life or cause serious injury to property shall, whether any injury to person or property has been actually caused or not, be punished with transportation for life or any shorter term, to which fine may be added, or with imprisonment for a term which may extend to ten years, to which fine may be added.

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
4.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to refrain from any unlawful and malicious activities involving explosive substances within the Union of Burma. The company understands that: a. Any person who unlawfully and maliciously does any act with intent to cause by an explosive substance, or conspires to cause by an explosive substance, an explosion in the Union of Burma of a nature likely to endanger life or to cause serious injury to property; or b. Makes or has in his possession or under his control any explosive substance with intent by means thereof to endanger life or cause serious injury to property in the Union of Burma, or to enable any other person by means thereof to endanger life or cause serious injury to property in the Union of Burma; Shall, whether any explosion does or does not take place and whether any injury to person or property has been actually caused or not, be punished with transportation for a term which may extend to twenty years, to which fine may be added, or with imprisonment for a term which may extend to seven years, to which fine may be added.
5.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to refrain from making or knowingly having in its possession or under its control any explosive substance under circumstances that give rise to a reasonable suspicion that it is not for a lawful object. The company understands that: Any person who makes or knowingly has in his possession or under his control any explosive substance, under such circumstances as to give rise to a reasonable suspicion that he is not making it or does not have it in his possession or under his control for a lawful object, shall, unless he can show that he made it or had it in his possession or under his control for a lawful object, be punishable with transportation for a term which may extend to fourteen years, to which fine may be added, or with imprisonment for a term which may extend to five years, to which fine may be added.
Para-	**The Industrial Explosive Materials Law (2018)**
6.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to construct a magazine with specified features on the approved plot upon receiving the direction from the Ministry, as outlined in sub-section (c). The company understands that:

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	On receipt of the direction from the Ministry under sub-section (b), the Chief Inspector shall notify the applicant to construct a magazine with specified features on the approved plot.
7.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits that if the Office of the Commander-in-Chief (Army) determines that the finding and remark of the sub-committee for procurement, provision, storage, and distribution of explosives is in conformity with the specifications, the office shall grant permission to the applicant, in this case, Taung Thaman Thitsar Co., Ltd., to carry out any one or more of import, transport, store, manufacture, use, process, or transfer industrial explosive materials. The company understands that: If the Office of the Commander-in-Chief (Army) found that the finding and remark of the sub-committee for procurement, provision, storage, and distribution of explosives is in conformity with the specifications, the office shall grant permission to the applicant to carry out any one or more of import, transport, store, manufacture, use, process, or transfer of industrial explosive materials. A copy of the permission shall be sent to the Ministry.
11.	When the application for a license under section 10 is received, Taung Thaman Thitsar Co., Ltd. acknowledges and commits to cooperate with the Chief Inspector in the inspection process to ensure that the magazine is constructed with the specified features. The company understands that: a. If the magazine is not constructed in specified features, Taung Thaman Thitsar Co., Ltd. agrees to promptly follow the instructions provided by the Chief Inspector, including alterations or additions to meet the specified requirements. b. If the magazine is constructed in specified features, Taung Thaman Thitsar Co., Ltd. understands that the Chief Inspector, with the approval of the Ministry, will grant a license to the applicant.
13.	Taung Thaman Thitsar Co., Ltd. commits to the timely renewal of its license as per the stipulations outlined in the law. The company understands and agrees that it shall submit a renewal application to the Chief Inspector at least 30 days before the expiration of the current license if it intends to continue storing industrial explosive materials. Taung Thaman Thitsar Co., Ltd. commits to adhere to the renewal process in accordance with the specified regulations.

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
14.	Taung Thaman Thitsar Co., Ltd. commits to applying for the renewal of its license in accordance with the stipulations outlined in the law. The company understands and agrees that, upon inspection and approval by the Chief Inspector, the license renewal will be sought with the approval of the Ministry if the magazine is constructed in specified features. Taung Thaman Thitsar Co., Ltd. is committed to fulfilling the necessary requirements for the renewal process as per the regulatory standards.
15.	Taung Thaman Thitsar Co., Ltd. commits to adhering to the following obligations as a licensee under the law: a. The company will systematically store industrial explosive materials within the permitted amount and in accordance with the specified features outlined in the law. b. Taung Thaman Thitsar Co., Ltd. agrees to accept inspections conducted by the Chief Inspector or an inspector as required from time to time. c. In the event of damage to property, injury, or death resulting from the loss, burning, or explosion of industrial explosive materials, the company will promptly inform the nearest police station and report the incident to the Chief Inspector in a timely manner. d. The company commits to paying the license fees stipulated by the Ministry to the Department as required by the law. Taung Thaman Thitsar Co., Ltd. understands and acknowledges its responsibilities and obligations as a licensee under the specified regulations.
16.	Taung Thaman Thitsar Co., Ltd. commits to the following obligations as a permission holder under the law: a. The company will store industrial explosive materials exclusively in the licensed magazine as permitted by the granted permission. b. Taung Thaman Thitsar Co., Ltd. agrees to take necessary preventive measures, following the specified specifications, to avoid harm during the transport, manufacture, use, or possession of industrial explosive materials. The company acknowledges and accepts these responsibilities as outlined in the law.
18.	Taung Thaman Thitsar Co., Ltd. commits not to refuse inspection by the Chief Inspector or any authorized inspector as mandated by the law.

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
20.	Taung Thaman Thitsar Co., Ltd. commits not to accept or deliver industrial explosive materials in an unlicensed magazine, as prohibited by the law.
21.	Taung Thaman Thitsar Co., Ltd. commits not to accept more than the limited amount of industrial explosive materials as specified in the license issued by the Ministry. Additionally, the company commits to promptly inform the nearest police station and report to the Chief Inspector in case of any incidents mentioned in sub-section (c) of section 15 due to industrial explosive materials. The company also pledges to renew the license before its expiration to ensure compliance with the law.
Para-	**The Vehicle Safety and Motor Vehicle Management Law (2020)**
18.	Taung Thaman Thitsar Co., Ltd. commits to diligently repairing and maintaining its motor vehicles to meet the safety standards specified by the Department. The company will ensure that its vehicles are in optimal condition, promoting safe driving practices and compliance with regulatory standards.
81.	Taung Thaman Thitsar Co., Ltd. commits to strictly adhere to regulations concerning the loading and transportation of dangerous goods in its motor vehicles. The company will ensure full compliance with stipulations to guarantee the safe and lawful transport of such goods in public places.
Para-	**The Vehicle Safety and Motor Vehicle Management Rules (2022)**
252.	Taung Thaman Thitsar Co., Ltd. commits to abide by the regulations stipulated under the road transport business law. The company will ensure that any motor vehicle used for commercial purposes is duly registered as a rental vehicle and holds the necessary business license in accordance with the law.
279.	Taung Thaman Thitsar Co., Ltd. commits to instruct its road users, including drivers and employees, to adhere to specified guides, road markings, and traffic signals in order to supervise and maintain safe traffic practices. The company will prioritize the safety and compliance of its road users to contribute to overall traffic management.
283.	Taung Thaman Thitsar Co., Ltd. commits to ensuring that all its motor vehicle drivers adhere strictly to road signs, markings, and traffic lights. In situations where a designated traffic supervisor is overseeing traffic, the company's drivers will follow their directions without deviation. This commitment is aimed at promoting safety, orderliness, and compliance with traffic regulations.

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
Para-	**Automobile Law (2015)**
45	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations prohibiting the driving, requesting someone to drive, or parking of motor vehicles in public places under the following conditions: (a) If the motor vehicle is not registered. (b) If the registration has been suspended, revoked, or expired, and the registration card is not displayed. (c) If the registration card has been revoked or is expired.
46.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to ensuring that all motor vehicles operated in public places are covered by risk insurance for others. Taung Thaman Thitsar Co., Ltd. understands the importance of having insurance coverage to mitigate risks and protect the interests of others in the event of accidents or incidents involving motor vehicles.
47.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to adhering to the regulations governing the driving of motor vehicles in public places: a. Taung Thaman Thitsar Co., Ltd. ensures that all drivers of motor vehicles carry their valid driving licenses with them while driving in public places. b. Taung Thaman Thitsar Co., Ltd. ensures that all drivers of motor vehicles possess valid driving licenses before driving in public places. **c.** Taung Thaman Thitsar Co., Ltd. prohibits the owner of, and the person responsible for, a motor vehicle from granting permission to individuals without a valid driving license to drive in public places.
48.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to ensuring that all motor vehicles driven in public places match the drivable types recorded in the driving licenses of the drivers. Taung Thaman Thitsar Co., Ltd. understands the importance of aligning the types of motor vehicles driven with the specifications recorded in the driving licenses to ensure safe and legal operation on public roads.
49.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the following regulations regarding driving conduct in public places: a. Taung Thaman Thitsar Co., Ltd. prohibits driving motor vehicles above the speed limit or below the minimum speed prescribed by law. b. Taung Thaman Thitsar Co., Ltd. prohibits driving motor vehicles in a manner that endangers others' safety or well-being.

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	c. Taung Thaman Thitsar Co., Ltd. prohibits driving motor vehicles after the consumption of narcotic drugs or alcohol.
50.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the following regulations: a. Taung Thaman Thitsar Co., Ltd. will not engage in the business of manufacturing, selling, or equipping motor vehicles without obtaining the necessary business license as required by law. b. Taung Thaman Thitsar Co., Ltd. will not engage in the business of maintaining or repairing motor vehicles without obtaining the required business license.
51.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to complying with the regulation prohibiting the offering of motor vehicle driving training without a valid business driving license.
52.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to complying with the regulation prohibiting the operation of a private business for inspecting motor vehicles without a valid business license.
53.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to complying with the following regulations: (a) Taung Thaman Thitsar Co., Ltd. will not make a motor vehicle registration number plate undistinguishable. (b) Taung Thaman Thitsar Co., Ltd. will not alter a motor vehicle registration number plate in a way that it can be confused with others. (c) Taung Thaman Thitsar Co., Ltd. will not use fake motor vehicle registration number plates on any vehicle.
54.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to complying with the following regulations: a. Working as a motor vehicle assistant without assistant permit. b. Driving a motor vehicle while in an inappropriate mental or physical state. c. Driving a motor vehicle loaded above the loading capacity. d. Failing to wear a helmet while driving a motor-cycle. e. Failing to wear a safety belt while driving vehicles; this includes passengers. f. Driving a motor vehicle in places reserved for pedestrians.

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	g. Changing, without legal permission or reasons backed up by evidence, the original type of a vehicle, its main parts, or the facts in a motor vehicle inspection certificate. h. Driving a motor-cycle without back mirror or silencer over the shock absorber.
55.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to complying with the following regulation: a. Taung Thaman Thitsar Co., Ltd. ensures that any individual who sells or transfers a motor vehicle from one owner to other requests to change the name of the registered person within 30 days starting from the date of selling or transferring the motor vehicle. b. Taung Thaman Thitsar Co., Ltd. ensures that any individual who inherits a motor vehicle requests to change the name of the registered person within 30 days starting from the date of the inheritance. c. Taung Thaman Thitsar Co., Ltd. prohibits describing wrong facts, changing, or excluding the real facts in a motor vehicle sale and transfer contract when applying to change the registered person.
56.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to complying with the regulation that prohibits the use or request to use an official document intended for one motor vehicle if it was given by the administration department for another vehicle
57.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to complying with the regulation that prohibits driving or working as an assistant using the driving license or assistant permit of another person.
Para-	**The Ethnic Rights Protection Law (2015)**
5.	Taung Thaman Thitsar Co., Ltd. commits to transparently inform, coordinate, and engage with the relevant local ethnic groups in all matters related to development works, major projects, businesses, and the extraction of natural resources within their respective areas. This commitment aims to ensure inclusive participation, respect for local communities, and collaboration in decision-making processes.
22.	Taung Thaman Thitsar Co., Ltd. commits to respecting and upholding the rights and privileges of ethnic groups, ensuring that no restrictions or prohibitions are imposed without credible and justifiable reasons. This commitment is grounded in the

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	principles of fairness, equality, and the protection of human rights for all ethnic communities involved.
23.	Taung Thaman Thitsar Co., Ltd. commits to strictly adhering to the law and ensuring that its provisions are not misused for political purposes. The company will conduct its operations in a lawful and impartial manner, refraining from engaging in any activities that could exploit legal provisions for political gain. This commitment emphasizes the company's dedication to ethical business practices and the separation of business operations from political influences.
24.	Taung Thaman Thitsar Co., Ltd. commits to fostering an environment of respect, understanding, and unity among all ethnic groups. We strictly prohibit any behavior or act that promotes feelings of hatred, enmity, or discord among ethnic communities. Our company values inclusivity, diversity, and mutual respect. We will actively promote initiatives that cultivate harmony and mutual understanding among all ethnic groups within our operations and broader community.
25.	Anyone who breaches the prohibition outlined in section 22, upon conviction, will face penalties such as imprisonment for a period not surpassing one year, or a fine not exceeding one hundred thousand kyats, or both, as part of the Taung Thaman Thitsar Co., Ltd. commitment.
Para-	**The Ethnic Rights Protection Rules (2019)**
20.	Taung Thaman Thitsar Co., Ltd., hereinafter referred to as "the Project Proponent," hereby commits to adhere to the following principles and requirements in proposing and developing the project in the area inhabited by ethnic peoples: i. Taung Thaman Thitsar Co., Ltd. recognizes the importance of ensuring that local ethnic groups are well-informed about the project's benefits and potential drawbacks. To achieve this, we pledge to provide comprehensive and accurate explanations of the project in advance, utilizing the language and methods accessible to the local ethnic groups to facilitate a clear understanding. ii. Taung Thaman Thitsar Co., Ltd. commits to conducting the project in strict accordance with the procedures, policies, and strategies outlined in the Myanmar Sustainable Development Plan (MSDP). Our actions will align with the sustainable development goals outlined in the MSDP to contribute positively to the local community and the region as a whole.

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	iii. Environmental impact and socio-economic development assessments are paramount in determining the project's effects on the area. Taung Thaman Thitsar Co., Ltd. undertakes to conduct thorough environmental impact assessments and socio-economic development impact assessments in accordance with the guidelines provided by the relevant department. These assessments will be conducted transparently and inclusively, involving the local indigenous peoples in the decision-making processes. Taung Thaman Thitsar Co., Ltd. affirms its commitment to open and transparent consultations with indigenous peoples at all stages of the environmental impact assessment and socio-economic development impact assessment processes. We acknowledge the significance of incorporating local perspectives and ensuring that the concerns and suggestions of the indigenous communities are duly considered in the decision-making and implementation of the project.
21.	Taung Thaman Thitsar Co., Ltd. commits to the following– i. According to Rules 20, before starting the project, a complete report must be submitted to the ministry and an agreement must be obtained. ii. Upon completion of the project implementation activities, pre-planned activities and completion conditions must be submitted to the Ministry.
Para-	**The Prevention and Control of Communicable Diseases Law (1995_Amending 2011)**
3.	Taung Thaman Thitsar Co., Ltd. recognizes the importance of preventing the outbreak of Communicable Diseases. As part of our commitment to public health, we hereby acknowledge and commit to supporting the Department of Health in implementing the following project activities: (a) Taung Thaman Thitsar Co., Ltd. will actively participate in the immunization of children, whether by injection or orally, as mandated by the Department of Health.
4.	Taung Thaman Thitsar Co., Ltd. recognizes the critical importance of public health, particularly in the face of Principal Epidemic Diseases or Notifiable Diseases. In the event of such occurrences: ((a) Taung Thaman Thitsar Co., Ltd. acknowledges and commits to cooperating with the Department of Health in the undertaking of immunization and other necessary measures aimed at controlling the spread of the disease.

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	(b) Taung Thaman Thitsar Co., Ltd. pledges to ensure that its employees and the public abide by the measures undertaken by the Department of Health under sub-section (a).
9.	Taung Thaman Thitsar Co., Ltd. acknowledges the significance of early detection and reporting in preventing the spread of diseases. In accordance with the law: (a) Taung Thaman Thitsar Co., Ltd. commits to immediate reporting to the nearest health department or hospital in the event of a rat fall. (b) Taung Thaman Thitsar Co., Ltd. pledges to promptly report any outbreak of a Principal Epidemic Disease to the nearest health department or hospital as required by the law.;
11.	Taung Thaman Thitsar Co., Ltd. acknowledges the importance of preventing and controlling the spread of Principal Epidemic Diseases. In recognition of the authority vested in the Health Officer, Taung Thaman Thitsar Co., Ltd. commits to cooperation by: ((a) Allowing the investigation of any patient or person required by the Health Officer. (b) Subjecting employees to medical examinations as directed by the Health Officer. (c) Facilitating laboratory investigations of stool, urine, sputum, and blood samples as required by the Health Officer. (d) Cooperating with and allowing investigations by injection as directed by the Health Officer. ((e) Supporting and participating in any other necessary investigations deemed crucial by the Health Officer for the prevention and control of Principal Epidemic Diseases.
12.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to complying with the regulation granting the Health Officer the right to conduct laboratory investigations of any food, water, and their necessary materials.
13.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to supporting the Health Officer's responsibility to report immediately the source of the Principal Epidemic Disease to the relevant Department of Health.
Para-	**The Control of Smoking and Consumption of Tobacco Product Law (2006)**

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
7.	Taung Thaman Thitsar Co., Ltd. recognizes the importance of promoting a healthy and smoke-free environment. In adherence to the law regarding non-smoking areas: a. Taung Thaman Thitsar Co., Ltd. pledges to designate all buildings of offices and departments as non-smoking areas, with the exception of private offices and rooms. Specific areas where smoking is allowed will be arranged in accordance with the law.; b. Taung Thaman Thitsar Co., Ltd. commits to declaring all buildings of factories and workshops as non-smoking areas, excluding private offices and rooms. Designated smoking areas will be established as per the legal requirements. c. Taung Thaman Thitsar Co., Ltd. undertakes to comply with notifications from the Ministry of Health regarding other public buildings, rooms, and places to be designated as non-smoking areas, and to arrange specific places for smoking as stipulated by the Ministry.
9.	Taung Thaman Thitsar Co., Ltd. acknowledges the responsibility placed on the person-in-charge for the promotion of a smoke-free environment. In compliance with the law, the person-in-charge at Taung Thaman Thitsar Co., Ltd. commits to: b. Designate specific places where smoking is allowed, as outlined in section 7, and ensure the placement of appropriate captions and marks indicating that it is a specific area where smoking is permitted, in accordance with legal stipulations. c. Undertake supervision and implement measures to prevent smoking in non-smoking areas within the premises of Taung Thaman Thitsar Co., Ltd.. d. Cooperate fully and accept inspections conducted by the supervisory body when they visit the premises for which Taung Thaman Thitsar Co., Ltd. is responsible
12.	Taung Thaman Thitsar Co., Ltd. emphasizes the importance of maintaining a respectful and compliant environment. In accordance with the law, Taung Thaman Thitsar Co., Ltd. commits to refraining from engaging in any of the following acts, recognizing that conviction may result in imprisonment, a fine, or both: a. (a) Taung Thaman Thitsar Co., Ltd. will not obstruct, disturb, prohibit, or commit assault against any member of the Supervisory Body who comes to inspect under this Law.

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	b. Taung Thaman Thitsar Co., Ltd. will not obstruct, disturb, prohibit, or commit assault against the person-in-charge who supervises to prevent smoking in non-smoking areas within the premises.
Para-	**The Employment and Skill Development Law (2013)**
5.	Taung Thaman Thitsar Co., Ltd. recognizes the significance of timely and transparent employment procedures. In accordance with the law: a. (i) Taung Thaman Thitsar Co., Ltd. commits to concluding an employment agreement within thirty days after appointing a worker to perform any work. This commitment excludes the appointment of permanent staff at the Government department or Government organization. (ii) Taung Thaman Thitsar Co., Ltd. understands that for certain appointments where pre-orientation and probation periods are prescribed, the stipulation in sub-section (1) regarding the thirty-day agreement does not apply. b. Taung Thaman Thitsar Co., Ltd. recognizes the importance of clarity in employment agreements. In accordance with the law: Taung Thaman Thitsar Co., Ltd. commits to include as following: i. category of employment; ii. period of probation; iii. wage, salary; iv. place of employment; v. term of agreement; vi. working hour; vii. holiday, day-off and leave; viii. over-time; ix. messing arrangement during working hour; x. accommodation; xi. medical treatment; xii. arrangement for ferry and travelling; xiii. terms and conditions to be abided by the workers; xiv. term of period agreed by the worker to continue to work after attending the training if the worker has to attend the training sent by the employer; xv. resignation from work and termination of work; xvi. termination of agreement;

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	xvii. obligation from work and termination of work; xviii. termination of employment agreement by mutual consent of employer and worker; xix. other matters; xx. prescribing, amending and adding the terms and condition of the agreement; xxi. miscellaneous. c. Taung Thaman Thitsar Co., Ltd. commits to including workplace terms and conditions in the employment agreement that are in conformity with any existing law. Taung Thaman Thitsar Co., Ltd. pledges that the benefits provided to workers shall not be less than those mandated by any existing law. Our commitment is to uphold and exceed the minimum standards set by applicable laws, ensuring the well-being and fair treatment of our employees. d. Taung Thaman Thitsar Co., Ltd. acknowledges and commits to adhere to the provision stipulated by the Ministry. In the event that the work is completed earlier than the period specified in the employment agreement, or if any part of the work is terminated due to unexpected causes or for any other reason leading to the termination of work, Taung Thaman Thitsar Co., Ltd. agrees to comply with the Ministry's notification to pay the stipulated compensation to the worker as outlined in the employment agreement e. Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the terms outlined in the employment agreement as specified in sub-section (a). Taung Thaman Thitsar Co., Ltd. agrees that these terms shall be applicable to daily wage earners and pieceworkers engaged temporarily at the Government organization, in accordance with the provisions set forth in the said employment agreement. f. Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the principle that conditions and benefits contained in the employment agreement may be amended by mutual agreement between the employer and the worker or workers. g. Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the requirement that a copy of the employment agreement concluded between the employer and worker shall be promptly sent to the relevant labor exchange office.

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	h. Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the provision that employment agreements concluded before the coming into force of this Law shall remain valid until the original term terminates.
14.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to conducting training programs aimed at enhancing the employment skills of workers who are either intended to be appointed or are currently employed by the company. Taung Thaman Thitsar Co., Ltd. pledges to align these training initiatives with the policies set forth by the Skill Development Body, ensuring that the training programs meet the specific requirements of the work carried out by the company.
15.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to: a. carry out the training for each work or compounding the work individually or group-wise by opening on-job training, training systematically at worksite, sending outside training and training by using information technology system, for arranging the training program to enhance the employment skill of the workers; b. appointing the youths of 16 years as apprentice, shall arrange the training for technology relating to the employment systematically in accord with the regulations prescribed by the skill development team.
29.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to adhering to the regulations stipulated by the skill development team regarding the use of the fund by the fund management committee: Taung Thaman Thitsar Co., Ltd. commits to utilizing the fund for the following purposes, as specified by the regulations: a. Sending employees to part-time or full-time training programs for skill development, facilitating the opening of training programs, and providing support or loans to employers extending training programs. b. Reissuing expenses incurred for employee training after scrutiny, in accordance with stipulations. c. Performing other matters as stipulated by the skill development team.
30.	(a) Taung Thaman Thitsar Co., Ltd. acknowledges and commits to fulfill its financial obligation by making monthly contributions to the fund as required by the law. The company shall pay an amount not less than 0.5% of the salary, including total wages paid to both worker supervisors and workers below such level within the industry and service sector.

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	(b) Taung Thaman Thitsar Co., Ltd. acknowledges and commits to strictly adhere to the prohibition outlined in sub-section (a). (c) The company affirms that the contribution paid, as specified in the law, shall not be deducted from the wage or salary of the workers.
31.	Taung Thaman Thitsar Co., Ltd. commits to the following directives outlined by the skill development team: a. Taung Thaman Thitsar Co., Ltd. will ensure timely payment of contributions to the fund, as stipulated under section 30, subsection (b). b. Taung Thaman Thitsar Co., Ltd. acknowledges that the contribution amount may vary based on factors such as the work sector, type of work, size of work, and number of employees. c. Taung Thaman Thitsar Co., Ltd. recognizes that exemptions from contributing to the fund may be granted by the skill development team upon submission of valid reasons by the employer.
Para-	**The Settlement of Labour Dispute Law (2012)**
38.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to engaging in negotiations and coordination regarding complaints within the prescribed period, as mandated by the law. Taung Thaman Thitsar Co., Ltd. affirms its commitment to diligently address complaints and will not fail to negotiate and coordinate within the stipulated time, except in cases of sufficient cause, as allowed by the relevant regulations.
39.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to strictly adhere to the prohibition stated in the law. The company affirms that no alteration to the conditions of service relating to workers involved in a dispute shall take place during the consecutive period before commencing the dispute and during the period under investigation before the Arbitration Body or Tribunal. Taung Thaman Thitsar Co., Ltd. pledges not to alter conditions that may adversely affect the interests of such workers immediately, ensuring compliance with the regulations set forth in the law
40.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the process outlined in this law. The company affirms that no party, including the employer and workers, shall proceed to lock-out or strike without first accepting negotiation, conciliation, and arbitration by the Arbitration Body in accordance with this law in the resolution of a dispute.

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
51.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the provision set forth in this law. The company affirms that in the course of settling disputes, no act or omission, without sufficient cause, shall be committed that would result in a reduction in production leading to a decrease in workers' benefits. Taung Thaman Thitsar Co., Ltd. understands that any such actions would make the company liable to pay full compensation, as determined by the Arbitration Body or Tribunal.
Para-	**The Leave and Holiday Act 1951 (Amended - 2014)**
3.	(2) Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations stipulated in this law. In the circumstance where any public holiday coincides with a weekly day of rest or another holiday, Taung Thaman Thitsar Co., Ltd. affirms that no alternative holiday will be allowed. The weekly day of rest or holiday, on which the public holiday incidentally falls, shall be regarded as a public holiday. In the event that an employee is required to work on a public holiday, Taung Thaman Thitsar Co., Ltd. pledges to remunerate the employee with basic wages or pay at double the usual rate, along with the cost of living allowance, if admissible, at the ordinary single rate. (3) Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the provision stated in this law. The company affirms that, by mutual agreement between employers and employees, a holiday without wages or pay may be granted on the occasion of religious festivals to non-Buddhist employees. (4) Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the directive in this law. The company affirms that the employer shall determine and allow at least one day in a week as the holiday on full wage or pay for its employees.
4.	(1) Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the provision outlined in this law. The company affirms that every employee who has completed a continuous period of 12 months' service shall be granted earned leave by their employer during the subsequent 12 months. – a. or employees over 15 years of age, Taung Thaman Thitsar Co., Ltd. pledges to provide earned leave with average wages or average pay for a period of ten consecutive days. and b. or employees under 15 years of age, the company commits to granting earned leave with average wages or average pay for a period of 14 consecutive days.

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	(3) Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the guidelines set forth in this law. The company affirms that the employer shall fix the time at which earned leave may be taken by the employee within three months from the last date of the period of 12 months for which the earned leave is to be granted. Additionally, Taung Thaman Thitsar Co., Ltd. acknowledges that accumulated earned leave may be granted to the employee at any time during any period not exceeding three years, subject to mutual agreement between the employer and the employee concerned.
6.	(1) Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the provision outlined in this law. The company affirms that an employee shall be entitled to leave on a medical certificate with wages or pay (as the case may be) not exceeding 30 days in a year. (*Provided that leave on medical certificate shall not be admissible to an employee intil he has benn in service for at least six months, and that grant of such leave shall be subject to a waiting period of three days for which he shall be paid half his usual pay or wages (as the case may be). If, however, an employee has not been in service for at least six months, he shall be admissible to leave on medical certificate without pay.* (2) Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the conditions outlined in this law. The company affirms that leave on a medical certificate shall be granted upon the production of a certificate (in order of priority) from the medical officer of the trade, industry, or establishment concerned. In cases where this is not applicable, Taung Thaman Thitsar Co., Ltd. pledges to accept certificates from a registered doctor. For government employees, the company recognizes the validity of certificates from a government medical officer, and for railway employees, certificates from the railway medical officer are acknowledged.
11.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the requirement stipulated in this law. The company affirms that it shall keep and maintain the registers and records as may be prescribed by the relevant authorities.
Para-	**The Conservation of Water Resources and Rivers Law 2006 (Amended 2017)**
6.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the powers vested in the Directorate as outlined in this law. The company affirms its understanding that the Directorate has the authority to:

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	a. grant permission after examining the application for permission to carry out the construction of switchback, dockyard, wet dockyard and water-tight dockyard, building of jetty and landing stage and vessel landing by drainage in the river-creek boundary, bank boundary and waterfront boundary; b. permit, after scrutiny, to pile sand, shingle and other heavy substances within the bank boundary and waterfront boundary; c. issue recommendation to the relevant government department and organization in respect of application for construction of buildings and bridges in the river-creek boundary, bank boundary and waterfront boundary; d. determine of waterway grade, issuing information on opening and closing of waterway and warning on the use of waterway from time to time; e. determine the size of vessel and number of barges to ply along each waterway, and determining of draught; f. choose site in the river for the inland vessels to dock, demarcating of port boundary, and opening and closing thereof; g. issue recommendation to the relevant government department and organization after scrutiny as to whether or not the waterways of the rivers creeks can be affected adversely, on the application to grant permit for business of sand suction, sand dredging, sand excavating, rivers shingle suction, panning for gold, gold mineral dredging or extracting resources in river-creek boundary, bank boundary and waterfront boundary; h. issue notifications prescribing terms and conditions in accordance with the guidance of the Ministry in respect of the navigation of vessels in rivers and creeks for conservation of water resources, rivers and creeks.
8.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the prohibition outlined in this law. The company affirms that no person associated with Taung Thaman Thitsar Co., Ltd. shall (a) carry out any act or channel shifting with the aim to ruin the water resources and rivers and creeks.
11.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the prohibition outlined in this law. The company affirms that no person associated with Taung Thaman Thitsar Co., Ltd. shall: (a) dispose of engine oil, chemical, poisonous material and other materials which may cause environmental damage, or dispose of explosives from the bank or

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	from a vessel which is plying, vessel which has berthed, anchored, stranded or sunk. (c) dispose of disposal soil and other materials from panning for gold, gold mineral dredging or resource production in the river and creek, into the river and creek or into the water outlet gully which can flow into the river and creek.
12.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the prohibition outlined in this law. The company affirms that no person associated with Taung Thaman Thitsar Co., Ltd. shall carry out growing of garden, digging, filling, silt trapping, closing pond, dyke building or erecting spur in the river-creek boundary, bank boundary and waterfront boundary without the permission of the relevant government department and organization.
15.	In the river-creek boundary, bank boundary and waterfront boundary, no person, without the permission of the Directorate, shall: (a) carry out the construction of waterway training structure, switchback, dockyard, wet dockyard, water-tight dockyard, building of jetty and pier, the construction of landing lane and landing stage, vessel landing by drainage, drainage, and the construction of temporary bridge of river and creek. (b) dig husbandry pond to carry out fish, prawn, crab, soft-shell crab and other husbandry works.
19.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the prohibition outlined in this law. The company affirms that no person associated with Taung Thaman Thitsar Co., Ltd. shall dispose of any substance into the river-creek that may cause damage to waterway or change of watercourse from the bank or vessel which is plying, vessel which has berthed, anchored, stranded or sunk.
21.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the prohibition outlined in this law. The company affirms that no person associated with Taung Thaman Thitsar Co., Ltd. shall (a) build lavatories unsuitable to the urban and rural community lifestyle in the bank area and waterfront area. (b) drill well or pond or dig earth without the permission of the Directorate.
22.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the prohibition outlined in this law. The company affirms that no person associated with Taung Thaman Thitsar Co., Ltd. shall without the permission of the directorate, pile sand,

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	shingle and other heavy materials for business purposes in the bank area and waterfront area.
23.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the prohibition outlined in this law. The company affirms that no person associated with Taung Thaman Thitsar Co., Ltd. shall (b) without the permission of Directorate, carry out the construction of roads and bank protection structure, and river bank training work.
24.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the prohibition outlined in this law. The company affirms that no person associated with Taung Thaman Thitsar Co., Ltd. shall (b) violate the conditions prescribed by the Directorate so as not to cause water pollution and change of watercourse in rivers and creeks.
30.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the regulatory requirements outlined in this law. The company affirms that any government department, organization, or person associated with Taung Thaman Thitsar Co., Ltd., desiring to undertake activities such as constructing drainage, utilizing river water intake, constructing bridges spanning rivers, connecting underground pipes, connecting underground electric power cables, connecting underground telecom cables, or digging in rivers and creeks, bank boundaries, and waterfront boundaries, under the requirement of work, shall carry out such activities only after obtaining the approval of the Ministry of Transport.
Para-	**The Myanmar Engineering Council Law (2013) (Amended 2019, 2022)**
34.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the provisions outlined in the Myanmar Engineering Council Law. In the event of any violation of the provisions of this Law, prohibition of rules, orders, and directives issued under this Law, or any conditions mentioned in the register certificate obtained by any person affiliated with Taung Thaman Thitsar Co., Ltd., the Executive Committee of the Myanmar Engineering Council may impose administrative penalties. These penalties may include (a) warning; (b) causing to pay the stipulated fine; (c) suspending the register certificate for a limited period;

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	(d) cancelling the register certificate.
37.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to adhere to the regulations set forth in the Myanmar Engineering Council Law. The company affirms that any person associated with Taung Thaman Thitsar Co., Ltd., excluding engineering civil service personnel appointed at Government departments and Government organizations engaged in public works, shall not practice engineering and technical works without the requisite register certificate issued by the Council.
Para-	**Myanmar Fire Force Law (2015)**
24.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to strictly adhering to the directives of fire safety issued under section 16 by the head of the relevant Township Department of Fire Services.
25.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations outlined in this law. The company affirms that, as the owner or manager of its respective facilities, including factories, workshops, bus terminals, airports, ports, hotels, motels, lodgings, condominiums, markets, departments, organizations, or businesses exposed to fire hazards, Taung Thaman Thitsar Co., Ltd. shall adhere to the directives of the Department of Fire Services. Specifically, the company shall: a. Not fail to form the Reserve fire Brigade; b. Not fail to provide fire safety equipment.
30.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to refraining from removing, clearing, or transferring evidence from the specified area of a place razed by fire before the cause of the fire and the area of origin are inspected and confirmed by the relevant authorities.
31.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to not forming, reorganizing, or dissolving the Auxiliary Fire Brigade without the direction or permission of the Department of Fire Services.
32.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to refraining from forming or dissolving the Reserve Fire Brigade without the direction or permission of the Department of Fire Services.
Para-	**The Labour Organization Law (2011)**
17.	Taung Thaman Thitsar Co., Ltd. acknowledges and respects the rights of labor organizations as outlined in the labor laws. Taung Thaman Thitsar Co., Ltd.

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	recognizes the importance of allowing labor organizations the freedom to draw up their constitution and rules, elect their representatives, organize their administration and activities, and formulate their programmes. Furthermore, Taung Thaman Thitsar Co., Ltd. acknowledges that labour organizations have the right to negotiate and settle with the employer in cases where workers are unable to obtain and enjoy their rights as outlined in the labour laws. Taung Thaman Thitsar Co., Ltd. commits to upholding the rights of labour organizations within its organization. Taung Thaman Thitsar Co., Ltd. pledges to engage in fair and transparent negotiations with labour organizations to address any concerns related to workers' rights and to strive for mutually beneficial agreements. In instances where agreements cannot be reached, Taung Thaman Thitsar Co., Ltd. commits to adhering to relevant laws and regulations regarding dispute resolution processes.
18.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to uphold the rights stipulated in this law. The company recognizes that labor organizations have the right to demand the relevant employer to re-appoint a worker if there is cause to believe that the dismissal was based on labor organization membership or activities, or if the reasons for dismissal were not in conformity with labor laws.
19.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to respect the rights established by this law. The company recognizes that labor organizations have the right to send representatives to the Conciliation Body for the resolution of disputes between the employer and workers. Furthermore, Taung Thaman Thitsar Co., Ltd. affirms the right of labor organizations to send representatives to Conciliation Tribunals, where applicable, which are formed with representatives from various levels of labor organizations.
20.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the principles outlined in this law. The company affirms that in discussions with the Government regarding worker's rights or interests contained in labor laws, both the employer and the complaining workers, as well as the representatives of the labor organization, have the right to participate and discuss.
21.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to respect the rights outlined in this law. The company recognizes that labor organizations have the right

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	to participate in the resolution of collective bargains of the workers in accordance with labor laws.
22.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to uphold the principles set forth in this law. The company recognizes that labor organizations shall carry out peaceful activities, including holding meetings, going on strike, and conducting other collective activities, in accordance with their established procedures, regulations, by-laws, and any directives prescribed by the relevant Labor Federation
29.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to recognizing the labour organizations within its trade as the organizations representing the workers
30.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to allowing workers assigned duties on the recommendation of the relevant executive committee to perform such duties, not exceeding two days per month, unless otherwise agreed upon. During this period, the worker's absence from their original duty shall be deemed as part of their regular work responsibilities.
31.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to providing assistance to labour organizations upon request for the benefit of its workers. However, Taung Thaman Thitsar Co., Ltd. affirms its commitment to uphold the principles of autonomy and independence in labour organization activities. Taung Thaman Thitsar Co., Ltd. pledges not to engage in any actions intended to promote the establishment or functioning of labour organizations under its domination or control, whether through financial means or other methods of influence.
43.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to adhering to the regulations regarding lock-outs of public utility services or services not included in public utility services.
44.	Taung Thaman Thitsar Co., Ltd. acknowledges that no employer shall: a. lock-out a work due to such dispute during the pendency of a trade dispute settlement; b. carry out an illegal lock-out which is involved with any provision contained in sub sections (a) and (c) of section 41; c. dismiss a worker who opposes an illegal lock-out which is involved with any provision contained in sub-sections (a) and (c) of section 41; d. dismiss a worker for his membership in a labor organization for the exercise of organizational activities or participating in a strike in accord with this Law.

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	We commit to upholding the rights of workers as outlined in the law. We will not engage in actions that violate the rights of workers to organize, participate in labor activities, or oppose illegal lock-outs. Taung Thaman Thitsar Co., Ltd. will ensure compliance with all provisions related to labor rights and disputes.
Para-	**The Minimum Wages Law (2013)**
12.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the minimum wage law. The company affirms that it : a. shall not pay wage to the worker less than the minimum wage stipulated under this Law; b. may pay more than the minimum wage stipulated under this Law; c. shall not have the right to deduct any other wage except the wage for which it has the right to deduct as stipulated in the notification issued under this Law; d. shall pay the minimum wage to the workers working in the commerce, production business and service in cash. Moreover, if the specific benefits, interests or opportunities are to be paid, it may be paid in cash in accord with the stipulations or jointly in some cash and in some produce prescribed in local price according to the desire of the worker; e. may pay jointly in some cash and some produce prescribed in local price according to the local custom or desire of the majority of workers or collective agreement in paying the minimum wage to the workers and working in the agriculture and livestock breeding business. Such payment shall be for any personal use and benefit of the worker and his family and the value shall also be considerable and fair.
13.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the minimum wage law. The company affirms that it: a. shall inform the workers the rates of minimum wage relating to the business among the rates of minimum wage stipulated under this Law and advertise it at the workplace to enable to be seen by the relevant workers; b. shall record the lists, schedules, documents and wages of the workers correctly in accord with the stipulation; c. shall report the lists, schedules and documents recorded under sub-section (b) to the relevant department in accord with the stipulations; d. shall accept the inspection when summoned by the inspection. Moreover, he shall produce the said lists and documents when so required;

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	e. shall allow the entry and inspection of the inspector workplaces of commerce, production and service, agriculture and livestock breeding and give necessary assistances; f. shall give them holiday for medical treatment in accord with the stipulations if the workers cannot work due to sickness; g. shall give holiday without deducting from the minimum wage, in accord with the stipulations if the funeral matter of the family of worker or his parent occurs.
22.	Taung Thaman Thitsar Co., Ltd. acknowledges that as an employer, we: (a) shall not fail to pay the workers the minimum wage stipulated under this Law; (b)shall not pay to the workers less than the minimum wages and other benefits which is entitled by the worker under section 14; (c) relating to the accounts, schedules, documents and lists of wage of the workers: (i) shall not make false entry, deceitful recording or false and deceitful reporting; (ii) shall not fail to report to the relevant department in accord with the stipulations; (iii) shall not fail to produce when required by the inspection officer; (d) shall not fail to go and accept inspection when summoned by the inspection officer; (e) shall not obstruct or interfere with the inspection officer who inspects on duty. We commit to upholding the rights of workers and complying with all provisions related to wages, benefits, and inspections as outlined in the law. Taung Thaman Thitsar Co., Ltd. will ensure transparency, accuracy, and cooperation in all matters related to worker wages and inspections.
24.	Taung Thaman Thitsar Co., Ltd. acknowledges that as an employer, we : (a) shall not violate any term and condition contained in the minimum wage notification; (b) shall not fail to inform the workers relating to the rates of minimum wage concerning to his workers among the rates of minimum wage stipulated under this Law and announce at the place where the workers are able to see it in the work centre and workplace We commit to complying with all terms and conditions outlined in the minimum wage notification and ensuring that our workers are informed about the minimum wage rates as required by law. Taung Thaman Thitsar Co., Ltd. will maintain transparency and accessibility regarding minimum wage information for our workers.

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
Para-	**The Payment of Wages Law (2016)**
3.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the minimum wage law. The company affirms that it a. shall pay wages to the worker employing in his business in local currency or foreign currencies stipulated by the Central Bank of Myanmar. Such payment may be paid in cash or cheque or deposit into the bank account of the worker with the agreement between the employer and the worker. b. In paying such wages; i. if it is necessary to pay particular benefit, profits and opportunities for workers working in commerce, production and service businesses, it may be paid in cash or some in cash and some in things set up by local price on own volition of workers in accordance with the stipulations. ii. for workers employing in agriculture and livestock breeding business, it may be paid some wage in cash and something set up by local price according to custom, or on the volition of majority of worker or by collective agreement. In paying so, it shall be for personal use and the interest of his family, and shall be appropriate and equitable. c. If any worker is conscripted under the Public Military Service Law, the (60) days of wages shall be paid as a special right.
4.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the minimum wage law. The company affirms that it : a. shall pay wages at the end of the work or at the time agreed to pay to the worker for hourly, daily, weekly or other part time work, or temporary or piece work; b. shall not exceed one month than the period agreed with the worker under sub-section (a) to pay wages; c. shall pay the wages for the permanent work monthly. In making such payment: i. if workers are not more than 100, wages shall be paid at the end of the period for payment of wage ii. if workers are more than 100, it shall be paid no later than five days after the end of the period for payment of wage;

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	d. shall pay the due wages within two working days from the date of termination, if a worker is terminated; e. shall pay the wages at the end of the period for payment of wages, if a worker resigns on his own volition by sending prior written notice of resignation. f. shall pay the due wages to a legal heir within two working days after the decease, if a worker is deceases. g. shall pay all wages on a working day.
5.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the provisions outlined in the payment of wages law. In the event that the employer encounters difficulties to make payment under sub-section (c) of Section 4, due to any unexpected condition, including natural disasters, Taung Thaman Thitsar Co., Ltd. shall, on reasonable grounds, submit the altered payment date with the consent of the workers to the Department.
7.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the regulations specified in this law. In circumstances where the Department, with the approval of the Ministry, allows employers to postpone payment within the appropriate time under stipulated conditions, Taung Thaman Thitsar Co., Ltd. pledges to abide by the approved terms. Additionally, the company recognizes that certain deductions, including b. expenses which are allowance for accommodation and ferry service arranged by the employer, meal allowance, electricity charges, water service charges and income taxes liable to be paid by worker and cash paid in excess under a mistake, which are not included in the expression of wages under this Law; c. advance payment or reimburse or savings for the worker or any contribution under any law demanded by a worker from wages; d. from the wages of the worker under a decision of a Court or Arbitration Council or Arbitration Body.
8.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the regulation outlined in this law. The company affirms that the employer shall not deduct from the wages of the worker, except in accordance with the provisions of Section 7 and Section 11.
9.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations specified in this law. In deducting from wages under Section 7, Taung

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	Thaman Thitsar Co., Ltd. affirms that all deductions made by the employer shall not exceed 50 percent of the wages of a worker, except in cases of deduction for the failure of a worker to perform his duty.
10.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the minimum wage law. The company affirms that it: a. shall obtain prior approval of the Department for what deduction can be made from wage and how much can be deducted before deducting anything stipulated as a fine under section 11. b. shall post the approval contained in sub-section (a) in conspicuous places at relevant factory and work; c. shall not exceed fine deducted for compensation than the value of damage or loss by action or omission of a worker; d. in deducting from wages under Section 11: i. shall not deduct from wages without giving right to defence of the worker; ii. shall not deduct more than 5 percent of the monthly wages of the worker; e. shall not absolutely deduct as the fine from a worker under 16 years of age; f. may carry out the date of payment of passing fine in accordance with the agreement between the employer and the worker; g. shall deduct from wages for compensation due to loss of property within a limited period by an agreement of the relevant Township Conciliation Body; h. shall enter the deducting cash from wages into the register and systematically maintain it; i. shall submit a report of the deduction from wages to the Department; shall use fines of deduction from wages under sub-section (b) of Section 11 for the worker benefit in coordination with legally registered Labour Organization in the factory.
11.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to adhere to the provisions outlined in this law. The company recognizes that the employer may designate fines to compensate for specific acts and omissions of a worker, as detailed below, and deduct from his wages: a. any loss of property and cash expressly entrusted to the worker by the employer due to intentional negligence and carelessness or dishonest acts or

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	omissions of the worker, which is caused directly by the carelessness and mistake of such worker; b. violation of any terms or conditions stipulated as fines in the employment agreement.
12.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations outlined in this law. a. the company affirms that workers may request settlement by themselves, or through a legally registered labor organization or the Workplace Coordination Committee in the factory, under the following conditions: i. deduction from wages obtainable without credible reason; ii. failure to pay overdue payment of wages. b. Taung Thaman Thitsar Co., Ltd. is dedicated to facilitating a fair and effective resolution process for workers facing such issues. If the employer fails to address the problem within six months from the date of deduction or failure to pay, the worker has the right to submit the matter to the inspector for resolution.
13.	(a) Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations outlined in this law. The company affirms that, in the event a worker submits a matter to the inspector for resolution under sub-section (b) of Section 12, the inspector may scrutinize the submission and, if necessary, interrogate the relevant persons to make an appropriate order. (b) Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the appeal process outlined in this law. If either the worker or employer is dissatisfied with the order made under sub-Section (a), they have the right to file an appeal to the chief inspector within 30 days from the date of such order. (c) the company affirms that it will fully cooperate in the appeal process. The chief inspector may make an appropriate order after scrutinizing the appeal under sub-section (b) and conducting a hearing with both the employer and the worker. (d) Taung Thaman Thitsar Co., Ltd. recognizes that the order of the Chief Inspector is final.
14.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to uphold the rights stipulated in this law. The company recognizes that the worker has the right to enjoy overtime wages as stipulated by the law if they work overtime.

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
22.	Taung Thaman Thitsar Co., Ltd. Limited acknowledges and commits to adhering to the terms outlined in Sections 4, 5, 8, 9, and 11 of the relevant regulation.
Para-	**The Workmen's Compensation Act 1924 (Amendment 1951, 1955, 1957, 2005)**
3.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the provisions outlined in this law. (1) he company recognizes that, in the event of personal injury to a workman caused by an accident arising out of and in the course of his employment, the employer shall be liable to pay compensation in accordance with the provisions of this Chapter. The company also acknowledges that, under specific circumstances outlined in the law, the employer shall not be liable for compensation in respect of any injury not resulting in death caused by an accident directly attributable to - (i) the workman having been at the time thereof under the influence of drink or drugs, or (ii) the willful disobedience of the workman to an order expressly given, or to a rule expressly framed, for the purpose of securing the safety of workmen, or (iii) the willful removal or disregard by the workman of any safety guard or other device which he knew to have been provided for the purpose of securing the safety of workmen. (2) Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the regulations outlined in this law. The company recognizes that if a workman, while in the service of an employer in whose service he has been employed for a continuous period of not less than six months in any employment specified in [List A of] Schedule III, contracts any disease specified therein as an occupational disease peculiar to that employment, the contracting of the disease shall be deemed to be an injury by accident within the meaning of this section. Taung Thaman Thitsar Co., Ltd. is dedicated to ensuring compliance with the provisions of this law. The company acknowledges that, unless the employer proves the contrary, the accident shall be deemed to have arisen out of and in the course of the employment.
8.	(1) Taung Thaman Thitsar Co., Ltd. is committed to adhering to all legal requirements regarding the payment of compensation to employees or their dependents in cases of work-related injuries resulting in death or disability. Taung Thaman Thitsar Co., Ltd. shall ensure that all compensation payments are made in accordance with the law, including the requirement for depositing compensation

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	amounts with the Commissioner. Additionally, Taung Thaman Thitsar Co., Ltd. may provide advances on account of compensation to dependents of deceased workmen, not exceeding an aggregate of one hundred rupees, subject to the deductions and repayment procedures outlined by the Commissioner. (2) Taung Thaman Thitsar Co., Ltd. is committed to complying with all regulations set forth by the Ministry of Labour with the approval of the Government regarding the deposit of compensation sums payable to entitled individuals. Any sum amounting to not less than the amount of money prescribed by notification made by the Ministry of Labour shall be promptly deposited with the Commissioner on behalf of the entitled person by Taung Thaman Thitsar Co., Ltd. (3) At Taung Thaman Thitsar Co., Ltd., we commit that upon receipt of compensation deposited with our Commissioner, we acknowledge it as a complete discharge of our obligation in respect to such compensation. (4) Upon the deposit of any money as compensation in respect of a deceased workman, Taung Thaman Thitsar Co., Ltd. commits to adhere to the following procedures: We will deduct from the deposited compensation the actual cost of the workman's funeral expenses, not exceeding twenty-five rupees, and promptly disburse this amount to the person who incurred the expenses. Furthermore, we pledge to undertake the necessary steps as directed by the Commissioner to notify the dependents of the deceased workman, inviting them to appear before the Commissioner to determine the distribution of the compensation. If, upon inquiry, the Commissioner determines that no dependents exist, we will refund the balance of the compensation to the employer who made the payment. Additionally, Taung Thaman Thitsar Co., Ltd. agrees to furnish a detailed statement of all disbursements upon the employer's request. (5) Taung Thaman Thitsar Co., Ltd. is committed to ensuring that compensation deposited in respect of a deceased workman is apportioned among the dependants of the deceased workman, subject to any deductions made under sub-section (4). The apportionment shall be determined by the Commissioner in such proportion as deemed appropriate, or at the discretion of the Commissioner, may be allotted to any one dependant. (6) Taung Thaman Thitsar Co., Ltd. acknowledges its obligation to ensure that compensation deposited with the Commissioner is disbursed to the rightful recipient in accordance with the law. Where the compensation is payable to a person who is

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	not a woman or under a legal disability, the Commissioner shall make the payment directly to the entitled person. In cases where the recipient is a woman or under a legal disability, the Commissioner may exercise discretion in making the payment. (7) Taung Thaman Thitsar Co., Ltd. acknowledges its responsibility to ensure that any lump sum deposited with the Commissioner, payable to a woman or a person under a legal disability, is managed for their benefit according to the directives of the Commissioner. We commit to comply with the Commissioner's directions regarding the investment, application, or other dealings with the sum for the benefit of the woman or the person during their disability. Furthermore, in cases where a half-monthly payment is payable to a person under a legal disability, Taung Thaman Thitsar Co., Ltd. recognizes that the Commissioner may, upon his own discretion or upon application, order the payment to be made during the disability to any dependant of the workman or to any other person deemed best suited to provide for the welfare of the workman. Taung Thaman Thitsar Co., Ltd. also acknowledges the authority of the Commissioner to vary any orders regarding the distribution of compensation or the management of sums payable to dependants due to changes in circumstances or other sufficient causes. (8) Taung Thaman Thitsar Co., Ltd. acknowledges the authority of the Commissioner to vary any order under sub-section (<S) if it is discovered that payment of compensation to any person has been obtained through fraud, impersonation, or other improper means. In such cases, any amount paid to or on behalf of such person may be subject to recovery as per the procedures outlined in section 31.
Para-	**The Social Security Law (2012)**
18.	(b) Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations outlined in this law. The company recognizes that the employer shall deduct contributions to be paid by the worker from his wages, along with the employer's own contribution, and subsequently pay these to the social security fund.
48.	a. Taung Thaman Thitsar Co., Ltd. acknowledges its obligation to ensure the welfare and safety of its workers by complying with the provisions outlined in section 45 regarding employment injury benefit insurance. We commit to registering for the employment injury benefit insurance system at the relevant township social security office. Furthermore, we pledge to pay contributions to the employment

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	injury benefit fund as stipulated, thus enabling our workers who are subject to compulsory registration to access the employment injury benefits they are entitled to b. Taung Thaman Thitsar Co., Ltd. acknowledges the option to voluntarily register for insurance coverage for workers who are not subject to compulsory registration under the employment injury benefit insurance system. We understand that by registering voluntarily, we can provide additional coverage and protection for our workers. c. Taung Thaman Thitsar Co., Ltd. commits to ensuring that when our workers register for employment injury benefit insurance as per sub-sections (a) and (b), they will submit a medical certificate as required by law.
49.	(b) Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations outlined in this law. The company recognizes that the insured, who has effected insurance for employment injury benefit under sub-sections (a) and (b) of section 48, shall only be entitled to employment injury benefits contained in this Law.
51.	Taung Thaman Thitsar Co., Ltd. commits a. to paying monthly contributions to the Employment Injury Benefit Fund at the rates stipulated under section 50. Additionally, we pledge to bear the expenses associated with making such payments b. to paying the defaulting fee stipulated under section 88 in addition to the contribution if we fail to contribute after effecting insurance for employment injury benefit.
53.	a. Taung Thaman Thitsar Co., Ltd. commits to coordinating, cooperating, and actively participating with the Board or insurance agent departments to implement workers' occupational safety measures and maintain health plans. Our aim is to prevent employment accidents, injuries, diseases, and fatalities while prioritizing the safety and education of our workers. b. Taung Thaman Thitsar Co., Ltd. commits to bearing the costs of medical care related to employment injuries resulting from criminal actions or omissions of the employer, or stemming from the employer's failure to maintain occupational safety plans and protections. Additionally, we pledge to fulfill all other benefits under this law without fail, in accordance with the stipulations outlined.

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
54.	a. Taung Thaman Thitsar Co., Ltd. commits to promptly reporting to the relevant township social security office if a serious employment accident occurs to any of our insured workers. We recognize the importance of immediate notification and pledge not to delay reporting without sufficient cause. b. Taung Thaman Thitsar Co., Ltd. commits to ensuring that our team of officers and staff who inspect establishments promptly report any instances of employment injury, death, or contracting of diseases to the relevant township social security office in accordance with the stipulations outlined.
55.	Taung Thaman Thitsar Co., Ltd. commits to providing the insured person, who is incapable of working due to employment injury resulting in reduced or suspended earnings, with free medical care and temporary disability benefits. These benefits amount to 70 percent of the average wage earned during the four months prior to the employment accident. The entitlement begins from the date of incapacity for work, and extends to a maximum of 12 months, as certified by medical documentation.
56.	a. Taung Thaman Thitsar Co., Ltd. acknowledges that the temporary disability benefit, as outlined in section 55, shall be terminated from the date on which the insured person becomes capable of working within 12 months. b. Taung Thaman Thitsar Co., Ltd. acknowledges that if an insured person remains incapable of working after the expiration of the 12-month period of temporary disability benefit, it shall be converted into permanent disability pension. c. Taung Thaman Thitsar Co., Ltd. acknowledges that if the medical certificate indicates the expectation of permanent disability for work during the 12-month period while temporary disability benefit is being received, the insured person has the right to terminate the temporary disability benefit, convert it into permanent disability benefit, and begin receiving it.
57.	Taung Thaman Thitsar Co., Ltd. acknowledges that the insured person has the right to receive permanent partial disability cash benefit in case of partial loss of capacity for work, or permanent total disability cash benefit in case of total loss of capacity for work due to an employment accident. The calculation of the benefit, as per section 58, shall be based on 70 percent of the average wage earned during the four months before the occurrence of the employment injury, relative to the percentage of loss of capacity for work determined by the Medical Board.
58.	Taung Thaman Thitsar Co., Ltd. acknowledges that individuals who suffer a loss of capacity to work may be entitled to permanent disability benefits calculated at 70

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	percent of a month's average wage as specified in section 57. These benefits are determined based on the percentage of loss of capacity for work and are outlined as follows: a. For cases with a degree of incapacity less than 20 percent, the individual has the right to enjoy a monthly cash benefit for five years in a lump sum; b. For cases with a degree of incapacity above 20 percent to 75 percent, the individual has the right to enjoy a monthly cash benefit for seven years in installments or in a lump sum, based on their preference. c. For cases with a degree of incapacity above 75 percent, the individual has the right to enjoy a monthly cash benefit for nine years in installments, a lump sum, or in monthly installments until death, based on their preference. d. If the medical certificate indicates that a permanently disabled person mentioned in sub-section (c) requires constant attendance from another person, the individual has the right to enjoy a supplement of 10 percent of their benefit in installments, a lump sum, or in monthly installments until death, based on their preference, in addition to the benefit outlined in sub-section (c).
65	Taung Thaman Thitsar Co., Ltd. acknowledges the following rights and responsibilities of the employer: (a) We have the right to reimbursement from benefits granted under this Law for payments made as a social obligation for an insured person in cases of health care, medical treatment, and other entitled benefits. (b) If the total amount of wages and cash benefits paid to the insured person during a period of sickness benefit, maternity benefit, or employment injury benefit under this Law exceeds the normal wages of that insured person, we may deduct the excess amount from benefits granted under this Law. Any payment of excess amount shall be promptly reported to the relevant township social security office.
66.	(a) Taung Thaman Thitsar Co., Ltd. acknowledges the following responsibilities and rights regarding health care and medical treatment as outlined in sections 67 and 68: (i) We shall not remove or terminate the insured person from work or reduce their wage level during the period in which they are enjoying sickness benefit, maternity benefit, or temporary disability benefit due to employment injury under this Law. (ii) we shall not reduce or deduct wages and fees of our workers because of liability for contributions payable under this Law.

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	(b) The insured person, in the event of injury due to the employer's violation of the restrictions outlined in sub-section (a), may submit the matter to the relevant township social security office for settlement in accordance with the stipulations.
75.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations outlined in this law. The company recognizes that employers of establishments applied by this Law: a. shall 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. shall 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. shall submit records of work and lists if requested by inspectorate or official assigned by the Social Security Head Office and various levels of Regional Social Security Office under this Law.
Para-	**The Occupational Safety and Health Law (2019)**
12.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations outlined in this law. The company recognizes that, according to the type of industries, the employer shall: (a) appoint a person in-charge for occupational safety and health according to the type of industries to closely supervise the safety and health of the workers in accordance with the specifications of the Ministry; (b) establish each Occupational Safety and Health Committee comprising equal number of employers and workers' representatives according to the types of industry without lessening the number of workers prescribed by the Ministry to be safe and

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	healthy workplace, in accordance with the specifications of the Ministry. In establishing the Committee, occupational safety and health matters for female workers shall be considered according to the nature of work.
14.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations outlined in this law. The persons in-charge for occupational safety and health appointed by the company shall adhere to this Law, as well as the rules, orders, directives, and procedures issued under this Law, ensuring a safe and healthy workplace.
16.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations outlined in this law. The company recognizes that inspectors shall inspect the workplace under this Law for occupational safety and health.
17.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations outlined in this law. The company recognizes that, for the purposes of occupational safety and health in line with the code of conduct, inspectors are entitled to: (a) enter, inspect and examine any workplace applicable to this Law without a warrant by showing their identity cards at any time; (b) inspect and copy all records, books, and documents relating to the workplace and process, and seize any of them as exhibits, if necessary; (c) take photographs and video records of the workplace situations and processes which may be harmful to the occupational safety and health; (d) assess and record the amount of impact and time on the workplace environment, due to noise, illumination, temperature, dust, fume and hazardous materials, with the assistance of an expert on the respective subjects, if necessary; (e) inquire any person working at the workplace during working hours about contracting occupational diseases or potential situations with the assistance of a certified doctor; (f) ask the responsible person from hospitals and medical clinics to confidentially send the medical report of a worker who is receiving medical treatment for injuring in a workplace accident or suffering from an occupational disease or information about death or the autopsy report requested with the form prescribed by the Department.

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
18.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations outlined in this law. The company recognizes that the inspectors may issue a temporary order to the employer for work stoppage, partially or wholly, with the approval of the chief inspector if any occupational accident, disease, dangerous occurrence, or major accident happens or is likely to happen due to any of the following facts: (a) impropriety to work continuously due to the unsafe workplace conditions, unsafe acts of workers, the existence of hazardous material and machinery at the workplace, or parts of machinery or laying out of machinery at the workplace, and working practices; (b) impropriety to work continuously due to violation of or failure to comply with any provision of this Law; (c) assumption to be harmful to workers at the workplace due to any act of negligence and carelessness or omission by any person; (d) necessity to evacuate workers for safety due to the imminent danger situation of the occupational injury;
26.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations outlined in this law. The company recognizes that, in accordance with this provision, any employer shall: (a) arrange to assess the risk severity of material and machinery used in the workplace and process, if necessary; (b) arrange to assess the risk of occupational factors, if necessary; (c) arrange to conduct medical examination for workers by the certified doctor in accordance with the specifications whether occupational diseases are contracted; (d) arrange to be safe and healthy workplace based on the findings of subsections (a), (b) and (c); (e) provide the suitable personal protective equipment, things and facilities adequately prescribed and allowed by the Department to the workers with free of charge, and make sure them to wear at the workplace; (f) take the preventive measures and emergency response preparedness; (g) establish dispensary, appoint registered doctors and nurses, and provide necessary medicines and facilities at the workplace where the workers are not less than the number of workers prescribed by the Ministry;

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	(h) cause to attend the training on occupational safety and health prescribed by the Ministry to the managers and workers from the respective type of work or branch including himself and members of the Occupational Safety and Health Committee; (i) arrange to give information immediately to the person in-charge for occupational safety and health or managers if any worker faces the situation which is likely to happen occupational injury or harm his life and health; (j) arrange to be safe and healthy for persons at the work place due to material and machinery used in the workplace or process, or wastes; (k) arrange to stop the process immediately, remove the workers from the workplace, and perform necessary evacuation and rescue procedures in case of imminent danger. If possible, workers are transferred to and worked at other suitable safety workplaces; (i) have instructions, warning signs, notices, posters and signage regarding occupational safety and health in accordance with the specifications; (m) arrange to follow the precautions in accessing to the restricted workplaces where may be harmful; (n) arrange to distribute or disseminate the manual and guidance regarding the occupational safety and health issued by respective Ministries to workers and persons related to the workplace for acquiring knowledge, technology and skills; (o) design the fire security plan and organize the fire-drills, and train to use systematically fire extinguishers and devices; (p) allow the chief inspector and inspectors to inspect the workplace, inquire, ask for documents or seize exhibits; (q) employ workers within the prescribed working hours at hazardous work and workplaces; (r) bear any expenditure regarding occupational safety and health measures.
27.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations outlined in this law. The company recognizes that no employer shall dismiss or suspend any worker due to one of the following reasons: (a) before obtaining the medical report of a registered doctor for being injury in the workplace or the medical report of a certified doctor for contracting occupational disease; (b) complaint about a matter of unsafe or health risk;

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	(c) undertaking the functions and duties of the Occupational Safety and Health Committee; (d) no longer working at the imminent danger situation or situation to be contracted the occupational disease.
28.	Taung Thaman Thitsar Co., Ltd. acknowledges that if any worker who has been injured due to an occupational accident or has contracted an occupational disease and is not covered under the Social Security Law 2012, we must pay for the medical expenses to assess the extent of capacity reduction and the class of disability of such worker.
29.	Taung Thaman Thitsar Co., Ltd. acknowledges the following responsibilities regarding the health and well-being of workers: (a) We have the authority to prohibit or restrict any worker from working if they do not meet the health standards based on medical check-up results conducted by a registered doctor, in accordance with the needs and nature of the industry/business. (b) We must promptly employ any worker who has been prohibited or restricted from work, as per subsection (a), back into their original position or at the relevant workplace upon submission of evidence of health improvement.; and (c) We must make necessary arrangements in the workplace to ensure the health and safety of female workers who are pregnant or breastfeeding, in order to prevent any harm to their health.
34.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations outlined in this law. The company recognizes that, in accordance with the specifications, an employer is liable to: (a) inform the Department in case of an occupational accident, dangerous occurrence and major accident; (b) submit a report with the medical report of the certified doctor to the Department, in case of any worker contracted any of the prescribed occupational diseases or being or likely to be occupational poisoning due to any material or process.
36.	(b) Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the prohibition outlined in this law. The company affirms that no person associated with Taung Thaman Thitsar Co., Ltd. shall, without the permission of the chief inspector, remove, destroy, add or alter the whole or part of material, machinery, equipment,

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	layouts, and documents related to the occupational accidents, dangerous occurrences, occupational diseases and occupational poisoning.
Para-	**The Protection and Preservation of Cultural Heritage Regions Law (2019)**
21.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to adhere to the provisions of existing laws, particularly concerning cultural heritages. If the company intends to carry out any undertaking within the world heritage region or national-level cultural heritage region, Taung Thaman Thitsar Co., Ltd. will apply to the Region or State Preservation Committee for prior permission, ensuring compliance with stipulations to confirm that there is no impact on cultural heritages. Similarly, if the undertaking is within a respective cultural heritage region apart from the world heritage region or national-level cultural heritage region, the company will apply to the Regional Preservation Committee for the necessary approvals: (b) in the buffer area: i.constructing roads, renovating and extending wharfs, parking lots, rail tracks, railway station, stadium, sports grounds, buildings and bridges; ii.conducting and erecting pylons, underground works, underground electric power lines, high voltage power lines, transformer stations, lamp posts and gas pipelines; iii.arranging the flights of helicopter, hot air balloons and gliders; iv.constructing theatres such as the entertainment building, accommodation facilities, recreation centers, riding and race camps and infrastructures.
22.	Taung Thaman Thitsar Co., Ltd. acknowledges that no person shall construct a building that does not conform to the conditions prescribed region-wise by the Ministry of Culture in the cultural heritage region. We commit to ensuring that any construction undertaken by our company complies with the prescribed conditions set forth by the Ministry of Culture for the respective cultural heritage region.
23.	Taung Thaman Thitsar Co., Ltd. acknowledges that no person shall plough, cultivate, or engage in any activity that may cause damage to the cultural heritage within the boundary notified by the Department in the cultural heritage region. We commit to ensuring that our activities, including ploughing, cultivation, and other operations, do not result in any damage to the cultural heritage sites within the notified boundaries established by the Department.
Para-	**The Protection and Preservation of Antique Objects Law (2015)**

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
12.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations outlined in this law. The company recognizes that if any employee or representative finds any object which has no owner or custodian, and it appears to be an antique object, Taung Thaman Thitsar Co., Ltd. shall promptly inform the relevant Ward or Village-Tract Administrator.
Para-	**The Protection and Preservation of Ancient Monuments Law (2015)**
12.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations outlined in this law. The company recognizes that if any employee or representative finds an ancient monument of over one hundred years old and above or under the ground or above or under the water, which has no owner or custodian, and it seems reasonable to assume that the said monument is an ancient monument, Taung Thaman Thitsar Co., Ltd. shall promptly inform the relevant Ward or Village-Tract Administrative Office.
15.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations outlined in this law. The company recognizes that if it desires to undertake any of the following activities within the specified area of an ancient monument, including: a. extending towns, wards and villages; b. constructing or extending or repairing new buildings including hotels, factories and residential buildings or fencing or 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; e. digging or extending wells, lakes, cannels and ponds; 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 g. placing and fencing ancient monuments in a private compound and area;

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	h. constructing a building which is not consistent with the terms and conditions stipulated according to the region by the Ministry near and at the surrounding of an ancient monument. Taung Thaman Thitsar Co., Ltd. shall apply to obtain prior permission from the Department.
18.	Taung Thaman Thitsar Co., Ltd. acknowledges that no one shall carry out any performance in Sections 14 and 15 without the permission of the Department. We commit to ensuring that we obtain the necessary permission from the Department before conducting any performance or activity in Sections 14 and 15 as per the regulations.
20.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to the prohibition outlined in this law. The company affirms that no person associated with Taung Thaman Thitsar Co., Ltd. shall carry out any of the following acts which is assumed to cause damage to an ancient monument within the specified area of an ancient monument or of a listed ancient monument without a written prior permission: e. discarding chemical substance and rubbish which can affect an ancient monument and the environment.
Para-	**The Forest Law (2018)**
12.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations outlined in this law. The company recognizes that if it wishes to carry out any development work or economic scheme within forest land and forest-covered land at the disposal of the Government, Taung Thaman Thitsar Co., Ltd. shall obtain prior approval from the Ministry.
Para-	**The Conservation of Biodiversity and Protected Areas Law (2018)**
29.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations outlined in this law. The company recognizes that, with the approval of the Ministry, the Director General: (a) shall check whether the licence application for a zoological garden or botanical garden conforms with the specified terms and conditions, and issue a licence if the conditions are met; (b) may withdraw a licence within the prescribed period or cancel it if a person who receives a licence violates the prescribed terms and conditions.

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
35.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations outlined in this law. The company recognizes that within a protected area, zoological garden, or botanical garden administered by the Government or in which the Government has subscribed share capital, a park warden may pass an administrative order against any person to pay a fine ranging from a minimum kyat 30,000 to a maximum kyat 100,000 for committing any of the following acts: (a) entering a prohibited area without permission; (c) digging on the land, cultivating or carrying out any activity; (d) extracting, collecting or destroying in any manner, any kind of wild flora or cultivated plant.
39.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations outlined in this law. The company recognizes that on conviction, individuals committing these acts may face imprisonment for a term not exceeding 3 years or a fine ranging from a minimum of kyats 200,000 to a maximum of kyats 500,000, or both: (d) intentionally polluting soil, water or air, damaging a water-course or poisoning or electrifying water, or using chemical or explosive materials in the water within the protected area;
Para-	**Prevention of Hazard from Chemical and Related Substances Law (2013)**
15.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations outlined in this law. The company recognizes that, before starting its chemical and related substances business under a obtained license, it shall - (a) undergo inspection for the safety and the power of resistance of the machinery and equipment by the respective Supervisory Board and Board of Inspection; (b) ensure that personnel serving in the work to the respective foreign trainings or the trainings and the expert trainings on prevention of hazard from the chemical and related substances opened by the government department and the government organizations.
16.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations outlined in this law. The company recognizes that, having obtained a license, it shall-

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	(b) 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) keep the required safety equipments enough in the chemical and related substances businesses, furthermore shall grant the personal protection equipments and dresses free of charge to the working persons; (d) 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) be inspected by the respective Supervisory Board and Boards of Inspection in respect of whether or not the hazard may impact on the Human Being and Animals' health and the environment; (f) make medical check up the working persons who will work in the chemical and related substances business and shall permit to serve in that work after obtaining the recommendation that his health is suitable for that work. This medical check up records shall be kept systematically; (g) 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) shall 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) shall transport only the permitted amount of the chemical and related substances in accordance with the prescriptive stipulations, if they are transported in local; (j) shall 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 licence;
17.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations outlined in this law. The company recognizes that, having obtained a license, it shall arrange insurance in accordance with the prescriptive stipulations to be able to pay compensation in the event of impact and damage occurring to human

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	beings, animals, or the environment in relation to its chemical and related substances businesses.
22.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations outlined in its registration certificate. The company recognizes that, having obtained the registration certificate, it shall strictly abide by the regulations specified in the certificate. Furthermore, Taung Thaman Thitsar Co., Ltd. is committed to complying with any orders and instructions issued occasionally by the Central Supervisory Board.
27.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations outlined in its license for controlling and decreasing the hazard of chemical and related substances. The company recognizes that, having obtained the license, it shall adhere to the following matters:- (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;
33.	Taung Thaman Thitsar Co., Ltd. commit to ensuring compliance with the regulations set forth by the Central Leading Board regarding the production, handling, storage, distribution, and transportation of chemical substances.
34.	Taung Thaman Thitsar Co., Ltd. commit to ensuring that our operations involving chemical and related substances are conducted only with the necessary licenses obtained from the appropriate authorities.
35.	Taung Thaman Thitsar Co., Ltd. commit to ensuring that all chemical and related substances used in our business activities are duly registered, compliant with regulations, and meet quality standards and norms as required by the authorities.
Para-	**The Electricity Law (2014)**
20.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations outlined in its electrical business permit. The company recognizes that,

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	as the permit holder, it shall abide by the rules, regulations, bye-laws, notifications, orders, directives, and procedures issued by the Ministry in carrying out the electrical business specified in the permit.
21.	(a) Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations outlined in its electrical business permit. The company recognizes that, as the permit holder shall, if causes damages and losses to any person and entity for failing to abide by this laws, rules, procedures, regulations, bye-laws, order and directives and failing to abide by the prescribed qualities and standardization, be liable according to law.
24.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations outlined in this law. The company recognizes that, in the event of damages or losses arising to any other electric power user or any electrical business due to its negligence, Taung Thaman Thitsar Co., Ltd. shall pay the calculated compensation in accordance with the method prescribed by the Ministry for the value of damage or loss.
46.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations outlined in this law. The company recognizes that no person shall operate the electrical installation and repair without obtaining the electrical professional certificate.
47.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to comply with the regulations outlined in this law. The company recognizes that no person shall operate the generation, transmission, connection of electric power without obtaining the electrical safety certificate.
50.	Taung Thaman Thitsar Co., Ltd. acknowledges that no permit holder shall sell, mortgage, lease, exchange, or transfer by any other means the permit, the whole, or any part of the business contained in the permit without the approval of the relevant government department or government organization which has issued the permit. We commit to complying with this regulation and obtaining approval from the appropriate government department or organization before engaging in any transactions involving the permit or the business contained within it.
Para-	**The Export and Import Law (2017)**

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
7.	Taung Thaman Thitsar Co., Ltd. acknowledges that a person who obtains any license shall not violate the conditions contained in the license. We commit to strictly adhering to all conditions outlined in our licenses and permits.
Para-	**Underground Water Act (1930)**
3.	Taung Thaman Thitsar Co., Ltd. acknowledges and commits to compliance with section 3, which specifies that no person shall sink a tube for the purpose of obtaining underground water except under and in accordance with the terms of a license granted by the water officer. Taung Thaman Thitsar Co., Ltd. shall apply for and obtain the necessary license according to the Rule. In accordance with Rule 16, Taung Thaman Thitsar Co., Ltd. recognizes that the Water Officer, the Director of Public Health, Burma, and any authorized assistant specially deputed by them, shall have access at all times.
Para-	**Public Health Law (1972)**
3.	Taung Thaman Thitsar Co., Ltd. fully acknowledges and commits to uphold the principles outlined in the law. In recognition of the government's mandate to advance the health standards of the working population and ensure the protection of workers' health from potential harm, Taung Thaman Thitsar Co., Ltd. pledges to cooperate with the government's authorized activities. This includes but is not limited to advisory, examination, supervisory, and prohibition activities specifically addressing the following health issues, as outlined in the law: 1. Environmental health activities 2. Matters concerning the production and sale of food by workers: 3. Matters concerning home appliances and beauty products used by working individuals 4. Matters concerning infectious diseases 5. Matters concerning private medical sectors 6. Matters concerning the utilization of medicine by the working population:
5.	Taung Thaman Thitsar Co., Ltd. solemnly acknowledges and commits to adhere to the provisions stipulated by the law. As per the legal requirements, Taung Thaman Thitsar Co., Ltd. acknowledges that organizations established under this law, organizations assigned by these groups, and the government department along with its subordinate agencies designated under this law possess the right to inspect and

Commitment of the enacted law and rules by Taung Thaman Thitsar Co., Ltd.	
	provide directives to our workshops at any given time. This authority extends to matters concerning environmental and health activities, foods, issues related to home appliances and beauty products intended for the use of our workforce, as well as medicines used by our working personnel.
10.	Taung Thaman Thitsar Co., Ltd. recognizes that any person referred to in section 9(1) under the law, regarding health and related provisions, must not fail to comply, violate, attempt to commit a crime, or act knowingly or unknowingly to breach the law. In the event of a violation by the corporation, each person in charge of the company shall be deemed to have committed the offense and may be subject to prosecution accordingly.

Article of the governmental legal framework mentioned above. We, Taung Thaman Thitsar Company Limited makes further commitments that we will comply and follow through as described in the paragraph, section and sub-section of the laws

Signed

Kyaw Myint

Managing Director

Taung Thaman Thitsar Co.,Ltd

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2.4.1 National Waste Management Strategy and Master Plan for Myanmar (2018 – 2030)

This rapid economic growth with urbanization and industrialization has led to significant challenges with the management of waste. Daily waste generation, especially in three of the largest cities in the country (Yangon, Mandalay and Nay Pyi Taw), have increased dramatically, which in turn is leading to a number of public health and environmental pollutions. Typically, between one to two-thirds of generated waste in many townships is not properly collected, and uncollected waste is often dumped on open land, in the streets and in waterbodies, or burned in the open, causing pollution to both surface and ground water. In addition, the volume of industrial and other hazardous waste is also growing rapidly in Myanmar, emphasizing the importance of an integrated approach to manage all waste.

In this regard, the ECD of the MONREC has been actively working with the International Environmental Technology Centre of the UN Environment and other relevant ministries, departments, institutions, state/regional governments, townships and all other relevant stakeholders to develop a National Waste Management Strategy and Master Plan for Myanmar.

The National Waste Management Strategy and Master Plan is the first national initiative aimed at institutionalizing waste management and offers a visionary documents and strategic guide to address key issues, needs and challenges whilst raising awareness amongst key stakeholders towards achieving a resource efficient and zero waste society. Moreover, this National Waste Management Strategy and Master Plan also intended to identify strategic directions, programs and actions to improve solid waste collection, reduction through 3Rs, intermediate treatment and disposal.

2.4.1.1 Vision Statement

The Vision statement of this National Waste Management Strategy and Master plan, outlined both in Myanmar's National Sustainable Development Strategy (NSDS, 2009) and the National Environment Policy (2018): The Vision "Sustainable, Green, Clean and Healthy Environment towards a Brighter future for Myanmar" was identified as a common declaration for the National Waste Management Strategy and Master Plan.

2.4.1.2 Mission Statement

The mission statement of this National Waste Management Strategy and Master plan is " To develop and implement the holistic and integrated waste management strategy based on principles of inclusiveness, zero waste, zero emissions and circular economy to achieve a greener, cleaner and healthier environment in Myanmar".

2.4.1.3 Setting National Goals, Objectives and Targets

The National Waste Management Strategy and Master Plan for Myanmar has identified the following strategic goals, each of which is then briefly discussed with some key targets and purposed activities.

Figure 2. 2 National Goals of National Waste Management Strategy and Master Plant for Myanamr

2.4.2 Myanmar National Building Code (2020)

2.4.2.1 Title and Scope

These regulations shall be known as the Myanmar National Building Code, hereinafter referred to as "this code", consist of 7 parts as follow:

1. Administration of Planning, Building and Built Environment
2. Architecture and Urban Design
3. Structural Design
4. Soil and Foundation
5. Building Services
6. Building Materials
7. Constructional Practices, Safety and Building Maintenance

The provisions of this code shall apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal and demolition of every urban development plan, building or structure or any appurtenances connected or attached to such buildings or structures.

2.4.2.2 Applicability of the Code

- All Parts of the Code and their sections shall apply to all buildings described in Part 2, as may be applicable.
- Where a building is erected, the Code applies to the design and construction of the building.
- Where the whole or any part of the building is removed, the Code applies to all parts of the building whether removed or not.
- Where the whole or any part of the building is demolished, the Code applies to any remaining part and to the work involved in demolition.
- Where a building is altered, the Code applies to the whole building whether existing or new except that the Code applies only to part if that part is completely self-contained with respect to facilities and safety measures required by the Code.
- Where the occupancy of a building is changed, the Code applies to all parts of the building affected by the change.
- Where development of land is undertaken the Code applies to the entire development of land.
- Existing Buildings The Code shall require the removal, alteration or abandonment, and prevent continuance of the use or occupancy of an existing building, by the opinion of the Authority, and if such building constitutes a hazard to the safety of the adjacent property or the occupants of the building itself.

2.4.2.3 Alternative Materials, Design and Methods of Construction and Equipment

The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety.

Research reports Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from approved sources.

Tests Whenever there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, the official shall have

the authority to require tests as evidence of compliance to be made at no expense to the jurisdiction. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the building official shall approve the testing procedures. Tests shall be performed by an approved agency. Reports of such tests shall be retained by the official for the period required for retention of public records.

2.5 Environmental Guidelines and Standards

2.5.1 National Environmental Quality (Emission) Guidelines (NEQG) – 2015

National Environmental Quality (Emission) Guidelines (NEQEG) for wastewater and noise levels, Air Emission are referenced in this EMP report. Followings are the environmental standards and guidelines adopted by EIA team.

Observerd values of the Environmental Quality (Air Quality, Noise Level, Water) will compare with the paragraph 1.1 (for the air emission), paragraph 1.2 (for the wastewater-construction phase) and paragraph 1.3 (for nosie), paragraph 2.6.4 (effluent levels for tourism and hospitality development) of the National Environmental Quality (Emission) Guideline, 2015. Moreover, for the observed value of gases quality (Carbon monoxide) will compare World health organization (WHO).

2.5.1.1 Air Emissions (General Guidelines)

Projects with significant sources of air emissions, and potential for significant impacts to ambient air quality, should prevent or minimize impacts by ensuring that: (i) emissions do not result in pollutant concentrations that reach or exceed ambient quality guidelines and standards, or in their absence the current World Health Organization (WHO) Air Quality Guidelines; and emissions do not contribute a significant portion to the attainment of relevant ambient air quality guidelines or standards (i.e. not exceeding 25 percent of the applicable air quality standards to allow additional, future sustainable development in the same airshed.

Table 2. 3 Guideline of Air Emission

Sr	Parameter	Averaging Period	GuidelineValue	Guidelines
1	Nitrogen dioxide	1-year 1-hour	40 (µg/m^3) 200 (µg/m^3)	NEQEG
2	Ozone	8-hour daily Maximum	100 (µg/m^3)	NEQEG
3	PM_{10}	1-year 24-hour	20 (µg/m^3) 50 (µg/m^3)	NEQEG

4	$PM_{2.5}$	1-year 24-hour	10 ($\mu g/m^3$) 25 ($\mu g/m^3$)	NEQEG
5	Sulfur dioxide	24-hour 10-minute	20 ($\mu g/m^3$) 500 ($\mu g/m^3$)	NEQEG
6.	Carbon Monoxide	24 hours	4 mg/m^3	WHO

2.5.1.2 Noise Levels

Noise prevention and mitigation measures should be applied where predicted or measured noise impacts from a project facility or operations exceed the applicable noise level guideline at the most sensitive point of reception. Noise impacts should not exceed the levels presented below, or result in a maximum increase in background levels of 3 dBA at the nearest receptor location off-site.

Table 2. 4 Guideline for Noise Levels

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

2.5.1.3 Site runoff and Wastewater Discharges (Construction Phase)

General and industry-specific wastewater guidelines applicable during project operations, the following guideline values apply during the construction phase of projects, covering storm water or surface water, and sanitary wastewater discharges from all project sites.

Table 2. 5 Guideline for Site runoff and wastewater discharges (construction phase)

Sr.	**Parameters**	**Units**	**Values**
1.	Biological Oxygen Demand	mg/l	30
2.	Chemical Oxygen Demand	mg/l	125
3.	Oil and grease	mg/l	10
4.	pH	mg/l	6-9

Sr.	Parameters	Units	Values
5.	Total Coliform bacteria	mg/l	400
6.	Total Nitrogen	mg/l	10
7.	Total Phosphorus	mg/l	2
8.	Total suspended solids.	mg/l	50

2.5.1.4 Effluent Levels for Tourism and Hospitality Development

This guideline applies to tourism and hospitality facilities, including hotels, resorts and other accommodation and catering facilities. Wastewater discharges should be managed through conventional treatment to achieve the indicated guideline values for discharge of sanitary water.

Table 2. 6 Effluent levels for Tourism and Hospitality Development

Sr.	Parameters	Units	Values
1.	5- Day Biochemical Oxygen Demand	mg/l	50
2.	Chemical Oxygen Demand	mg/l	250
3.	Oil and grease	mg/l	10
4.	pH	mg/l	6-9
5.	Total Coliform bacteria	mg/l	400
6.	Total Nitrogen	mg/l	10
7.	Total Phosphorus	mg/l	2
8.	Total suspended solids.	mg/l	50

2.5.2 Myanmar National Drinking Water Quality Standard (2019)

In terms of important public health aspect, especially regarding the guarantee of sufficient water availability and drinking water of good quality, depending on the transparency and acceptability of health, the following criteria must be checked in Myanmar National drinking water quality standard.

Table 2. 7 Priority parameters for the guarantee of sufficient water

Sr.	Parameters	Units	Guideline Values
1.	Total Coliforms	MPN/100 ml	10
2.	Fecal Coliforms	MPN/100 ml	3

Sr.	Parameters	Units	Guideline Values
3.	Taste	Acceptable/No objectionable taste	-
4.	Odor	Acceptable/No objectionable taste	-
5.	Color	TCU	15
6.	Turbidity	NTU	5
7.	Arsenic	mg/L	0.05
8.	Lead	mg/L	0.01
9.	Nitrate	mg/L	50
10.	Manganese	mg/L	0.4
11.	Chloride	mg/L	250
12.	Hardness	mg/L as $CaCO_3$	500
13.	Iron	mg/L	1
14.	pH	mg/L	6.5 – 8.5
15.	Sulphate	mg/L	250
16.	Total Dissolved Solids (TDS)	mg/L	1000

2.6 International Convention Treaties

2.6.1 Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (1989)

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, usually known as the Basel Convention, is an international treaty that was designed to reduce the movements of hazardous waste between nations, and specifically to prevent transfer of hazardous waste from developed to less developed countries. It does not, however, address the movement of radioactive waste. The convention is also intended to minimize the rate and toxicity of wastes generated, to ensure their environmentally sound management as closely as possible to the source of generation, and to assist developing countries in environmentally sound management of the hazardous and other wastes they generate. The convention was opened for signature on 21 March 1989, and entered into force on 5 May 1992. As of June 2023, there are 191 parties to the convention.

Myanmar ratfied the basel convention on 6 January 2015 and the convention entered into force for Myanmar on 6 April 2015.

2.6.2 Cartagena Protocol on Biodiversity to the convention on Biological Diversity (2000)

The Cartagena Protocol on Biosafety to the Convention on Biological Diversity is an international agreement which aims to ensure the safe handling, transport and use of living modified organisms (LMOs) resulting from modern biotechnology that may have adverse effects on biological diversity, taking also into account risks to human health. It was adopted on 29 January 2000 and entered into force on 11 September 2003.

Myanmar ratfied the cartagena protocol on biodiversity to the convention on bioligical diversity on 13 February 2008.

2.6.3 Forced Labour Convention, 1930 (No.29)

The Forced Labour Convention, the full title of which is the Convention Concerning Forced or Compulsory Labour, 1930 (No.29), is one of eight ILO fundamental conventions of the International Labour Organization. Its object and purpose is to suppress the use of forced labour in all its forms irrespective of the nature of the work or the sector of activity in which it may be performed. The Convention defines forced labour as "all work or service which is exacted from any person under the menace of any penalty and for which the said person has not offered himself voluntarily", with few exceptions like compulsory military service.

The convention was adopted in Geneva 28 June 1930 and came into force on 1 May 1932. Myanmar ratfied the Forced Labour Convention on 04 March 1955.

2.6.4 International Tropical Timber Agreement (2006)

The International Tropical Timber Agreement (ITTA), 1983) is an agreement to provide an effective framework for cooperation between tropical timber producers and consumers and to encourage the development of national policies aimed at sustainable utilization and conservation of tropical forests and their genetic resources. The International Tropical Timber Organization was established under this agreement, which first opened for signature on November 18, 1983, then Entered into force on April 1, 1985. There were subsequent treaties, with an increasing number of signatories, in 1994 (ITTA2) and 2006 (ITTA3).

ITTA3 (2006) aimed to "promote the expansion and diversification of international trade in tropical timber from sustainably managed and legally harvested forests and to promote the sustainable management of tropical timber producing forests". Myanmar ratfied The International Tropical Timber Agreement on 07 December 2011.

2.6.5 Kyoto Protocol to the United Nations Framework Convention on Climate Change (1997)

The Kyoto Protocol was an international treaty which extended the 1992 United Nations Framework Convention on Climate Change (UNFCCC) that commits state parties to reduce greenhouse gas emissions, based on the scientific consensus that global warming is occurring and that human-made CO2 emissions are driving it. The Kyoto Protocol was adopted in Kyoto, Japan, on 11 December 1997 and entered into force on 16 February 2005. The Kyoto Protocol implemented the objective of the UNFCCC to reduce the onset of global warming by reducing greenhouse gas concentrations in the atmosphere to "a level that would prevent dangerous anthropogenic interference with the climate system". Myanmar ratfied The Kyoto Protocol on 13 August 2003.

2.6.6 Montreal Protocol on Substances that deplete the Ozone Layer (1987)

The Montreal Protocol is an international treaty designed to protect the ozone layer by phasing out the production of numerous substances that are responsible for ozone depletion. It was agreed on 16 September 1987, and entered into force on 1 January 1989. As a result of the international agreement, the ozone hole in Antarctica is slowly recovering. Climate projections indicate that the ozone layer will return to 1980 levels between 2040 (across much of the world) and 2066 (over Antarctica). Due to its widespread adoption and implementation, it has been hailed as an example of successful international co-operation.

Myanmar ratified Vienna Convention for the protection of Ozone Layer and the Montreal Protocol on 24 November, 1993. Country Programme preparation was approved in 1994.

2.6.7 Stockholm Convention on Persistent Organic Pollutants (POPs) (2001)

Stockholm Convention on Persistent Organize Pollutants is an international environmental treaty, signed on 22 may 2001 in Stockholm and effective from 17 May 2004, that aims to eliminate or restrict the production and use of persistent organic pollutants (POPs).

Myanamr has become a party to the Stockholm Convention on Persistent Organic Pollutants (POPs) on 19 April 2004.

2.6.8 WHO Framework Convention on Tobacco Control (2005)

The World Health Organization Framework Convention on Tobacco Control (WHO FCTC) is a treaty adopted by the 56th World Health Assembly held in Geneva, Switzerland on 21 May 2003. It became the first World Health Organization treaty adopted under article 19 of the WHO constitution. The treaty came into force on 27 February 2005.

The FCTC, one of the most quickly ratified treaties in United Nations history, is a supranational agreement that seeks "to protect present and future generations from the devastating health, social, environmental and economic consequences of tobacco consumption and exposure to tobacco smoke" by enacting a set of universal standards stating the dangers of tobacco and limiting its use in all forms worldwide. To this end, the treaty's provisions include rules that govern the production, sale, distribution, advertisement, and taxation of tobacco.

Myanmar ratfied the WHO Framework convention on Tobacco Control on 21 April 2004 and the entered into force for Myanmar on 27 February 2005.

As the Taung Thaman Resort, we – Taung Thaman Thitsar Company Limited makes further commitment not to exceeed the environmental guidelines and standards which mentioned above in order not to cause pollution and fully comply and follow with the Interntaional treaties which are signed by Myanmar.

Signed

U Kyaw Myint
Managing Director
Taung Thaman Thitsar Co.,Ltd.

2.7 Institutional Framework

2.7.1 Ministry of Natural Resources and Environmental Conservation

The Environmental Conservation Department

The Ministry of Natural Resources and Environmental Conservation- MONREC is the focal and coordinating agency for overall environmental management in Myanmar. The Environmental Conservation Department - ECD, one of the 11 departments under MONREC, is responsible for implementing the countr's National Environmental Policy, overseeing the management and protection of natural resources and regulating pollution associated with water, air and land. The Environmental Conservation Department's main responsibilities are development of legislation related to environmental regulations, guidelines and procedures, coordination of environmental conservation activities, development of climate change, mitigation and adaptation, desertification control and ozone layer protection, and preparation of national reports in relation to international agreements.

2.7.2 Myanmar Investment Commission

Myanmar Investment Commission (MIC) is a government-appointed body with the aim of responsible investment development, protect the investors and their investments, and development of national economic environment through investments in accordance with the Myanmar Investment Law 2016. The MIC has duties to carry out investment promotion, facilitation, and coordination. Moreover, the MIC has the power to issue necessary notifications including the stipulation of investment promoted sectors and the types of restricted or prohibited investment activities, and permit or endorsement to investors. The objectives of MIC are described as follow:

- To protect investors according to the new investment law promulgated by Union Hluttaw (Parliament)
- To safeguard environmental conservation
- To deeply emphasize on social impact
- To practice accounting and auditing in accordance with international standard in financial matters including transparency and accountability
- To create job opportunities
- To promote respect for existing labour law
- To support corporate social responsibility
- To transfer technology

2.7.3 Mandalay City Development Committee

The Mandalay City Development Committee - MCDC is the administrative body of Mandalay, the second largest city in Myanmar. MCDC has wide-ranging responsibilities, including city planning, land administration, tax collection, and urban development. MCDC raises its own revenues through tax collection, fees, licenses and property development. MCDC's chairman acts as Mayor of Mandalay, and sits as Regional Minister for the Government of Mandalay Region. MCDC's mission is to make the city clean, to keep the city beautiful, and to enable city dwellers to enjoy a pleasant life.

2.8 LETTER OF ENDORSEMENT BY THE PROJECT PROPONENT

This Environmental Impact Assessment Report for "Taung Thama Resort" was prepared by OSHE Services company limited on behalf of Taung Thaman Thitsar Company Limited. I hereby issue my letter of endorsement to confirm:

a. Laws, Rules, Regulation and Precedures which are relatively that have already been entacted will be fully complied and followed;

b. the accuracy and completeness of the EIA;
c. that the EIA has been prepared in strict compliance with applicable laws including the EIA Procedure and with the ToR for the EIA; and
d. that the Project will at all times comply fully with the commitments, mitigation measures, and plans in the EIA Report.
e. At the time of decommissioning the project, the project will be conducted to avoid the impact on social and environmental issues. Furthermore, if there is any impact on them, the project will be taken to minimize the least impact.

Signed

U Kyaw Myint
Managing Director
Taung Thaman Thitsar Co.,Ltd.

2.9 COMMITMENT OF THIRD PARTY

This Environmental Impact Assessment Report has been done with reasonable skills, care and diligence in accordance with the stipulations of Environmental Conservation Law 2012, Environmental Conservation Rules (2014) and EIA Procedures (2015). I hear by signed this report on behalf of OSHE Services Company Limited to certify that all the information in it are true and convincing to the best of our knowledge.

Signed

U Soe Myint
Executive Director
OSHE Services Co.,Ltd.

3 PROJECT DESCRIPTION AND ALTERNATIVE

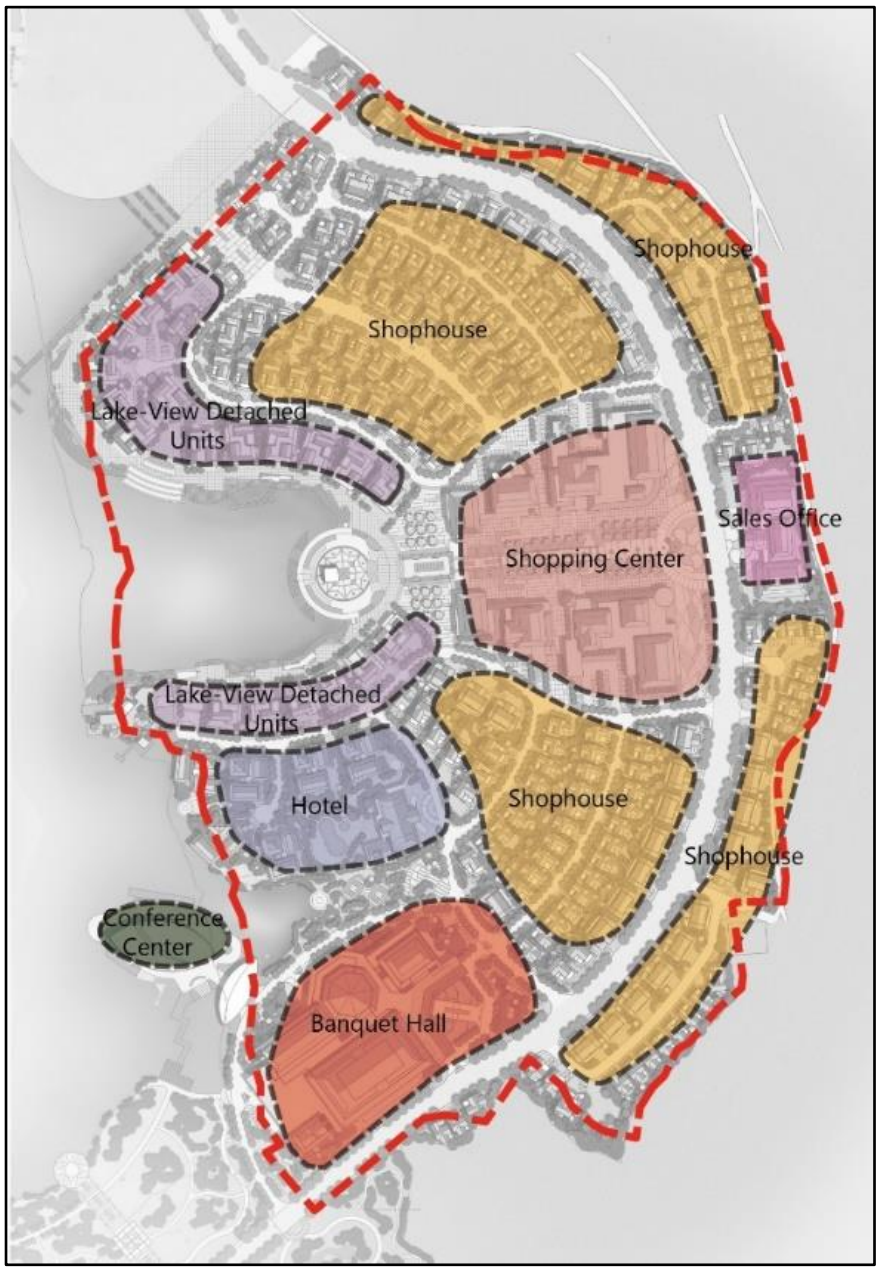
In this project description and alternative chapter, the details content of project planning, the processes to be carried out in the project, detailed information related to the project such as project location and building designs are provided.

The proposed project is called the **"Taung Thaman Resort:"** to support, in one way, the development of Myanmar tourism, showcase Myanmar rural culture, and create a place for public recreation. This project will be implemented by the Taung Thaman Thitsar Company Limited under the administration of Mandalay Region Government and Myanmar Investment Commission.

3.1 Project Location and Size

Taung Thaman Lake Resort project is located on the south-east bank of the infamous Taung Thaman Lake, adjacent to the U Bein Bridge on the north, and the location is U Paing no. 99, 100, 103/1, 103/2. 104, 105, 134/1, 135, 138/1, 138/2, 139, 150/2, 152/1, 152/2, 153/1, Taung Thaman plot no. (592), Taung Thaman villagetract, Amarapura Township, Mandalay District, Mandalay Region.

The project occupies a lot area of about 40.27 acres with the FAR being around 0.6. The total floor area is planned to be around 119,000 m^2. Urbanization already reached the vicinity of Taung Thaman Lake. Existing site has lush vegetation including wetland, grassland and valuable specimen trees.



3.2 Project Schedule and Budget

According to submission to Myanmar Investment Commission, the life span of the proposed project is 50 years, which started on 15-05-2014 and will expire on 26-03-2064.

The investment capital for the proposed project will be (32,382,245,052) Kyats. (150,000) millions kyat will be added for investment, the remaining 60 percent will be invested by the shareholders and the remaining 40 percent will be borrowed from the bank.

3.3 Project Components and It's Facilities

The Taung Thaman resort includes inner – roads, shop houses, low-rise commercial buildings, hotels, banquet halls and a conference center, parks, playground, court yard, bank, shopping mall, tourism service center, and sales office. List of project's components and its

associated facilities are shown in table 3.1 and the area used of project's components and its associated facilities is shown in table 3.2.

Sr.	**Component**	**Quantity (no.)**
1.	Shop House (Grade – A)	18
2.	Shop House (Grade – B)	16
3.	Shop House (Grade – C)	20
4.	Shop House (Grade – D)	22
5.	Court Yard	15
6.	Bank	1
7.	Shopping Mall	6
8.	Tourism Service Center	1
9.	Banquet Hall	1
10.	Sale Office	1
11.	Water Treatment Facility	1
12.	Wastewater Treatment Facility	1
13.	Swimming Pool (if included)	1
14.	Generator Room	1
15.	Transformer Room	1
16.	Tower	1
Total		107

A total of 101 units will be built and the shop houses are 2 Storyed Building, and will mainly sell Myanmar cultural and traditional arts and crafts. In addition, a tourism service center will be built for the service business that can provide tourism, and it will have 96 rooms.

Sr.	**Items**		**Unit**	**Area**
1	Lot area		m2	200319.57
2	Building footprint area		m2	50706.35
3	Total floor area		m2	119476.78
	of which	Shophouse A	m2	19433.70
		Shophouse B	m2	19989.90

		Shophouse C	m2	27209.51
		Lakefront Shophouse Type D	m2	11360.40
		Private Club Type E	m^2	1058.00
		Banquet hall	m^2	9270.00
		Conference center	m^2	3974.86
		Hotel	m^2	4870.01
		Shopping center	m^2	14776.98
		Supermarket	m^2	4249.29
		Sales office	m^2	2229.13
		Transformer room	m^2	500.00
		Generator set room	m^2	350.00
		Tower	m^2	205.00
4	FAR		-	0.60
5	Greening rate		-	35.2%
6	Building density		-	25.3%
7	Household count		Unit	220
8	Residents headcount		Head	704
9	Parking spaces		Space	1120

3.4 Project Design Principles

3.4.1 Preservation Development

Ecological and environmental preservation is primary focus for this project. Valuable large trees will be preserved wherever possible. Existing vegetation will be used to create community greenery and parks. Build designs will be adjusted to give way to preservation trees when their positions come into conflict. Sewage will be processed and treatmented to acceptable standards before drainage into the lake (the details treament process is described in the pargraph 3.23). Development and preservation proceed side by side in a mutually beneficial relationship.

3.4.2 International Resort Town

The world-famous U Bein Bridge and Taung Thaman Lake make up an ideal setting for a resort project. Mandalay is a cultural center, a Buddhist heritage city and a scenic gem of Myanmar. The urbanization of the city has reached the north bank of Taung Thaman Lake, providing necessary traffic accessibility and pedestrian flow to support the development.

3.4.3 Garden Community

Mandalay belongs to the tropical monsoon climate zone with rich biodiversity. The existing site is covered by lush bushes, trees, lawns and wetlands. The design will aim for a high greening rate and create a wide array of gardens space for the residents and tourists.

3.5 Master Plan of Taung Thaman Resort

3.5.1 Overall Zoning

The whole project are divided into three major zones: feature shop houses zone, central shopping zone and banquet- hotel zone. The shop houses can provide housing for the residents as well as commercial services for tourists.

3.5.2 Permeability

Permeability measures how conveniently various spaces of site can be accessed by vehicles and /or pedestrians.

The outdoor spaces is sorted into a hierarchy of spaces according to their degree of privacy; the most public is the central landscape area including the commercial plazas, lakeside walkways, bay-end wood deck; the secondary public spaces include the banquet halls, conference center, swimming pool and exercise grounds. The shop houses are arranged in pairs with their back gardens adjoined, so that the shop fronts will face the commercial street while

the back gardens will enjoy residential quietude. Cul-de-sac roads will be used where appropriate, such as in the hotel, banquet hall and conference center areas so that they can be open along the street but private along the lakeside.

3.5.3 Diversity and Legibility

All the commercial and residential buildings are low-rise. A shopping center of about 20,000 m^2 is designed, which can accommodate a wide variety of shops and bring out a vibrant commercial atmosphere. The continuous commercial interface is help created a central square. The concentrated commercial complex will contrast nicely with the smaller shop houses and free up space for more outdoor spatial diversity.

On the larger scale, a mix of grand spaces such as the central landscape will break up the monotonous expansion of repetitious spaces and serve as an easily recognizable reference node that can improve the spatial legibility of the whole project.

The linear lakefront is another highly identifiable space with the best landscape value. The curving lake bay increases the lake's perimeter, along which are designed a series of focal points spaced at intervals around 150m to refresh the lakeside walking experience.

The site is generally symmetrical, but locally varied. The east-west axis runs through the central square and links up the shopping center buildings and shop houses on both sides. In the south beyond the shop house blocks are situated the troika of a hotel, a banquet hall complex and a conference center. A series of feature commercial streets will be created in the shop house blocks, such as a cuisine street, a jade jewelry street and other streets traditional Myanmar flavors. The lakefront spaces will be lined up with chic bars and coffee shops. The central axis, beginning from the scales office on the west, strings up the commercial plaza, dry fountains, circular leisure courtyards to showcase a lively progression of varying spaces. The commercial plaza can serve as venue for promotion activities as well as for cultural events, such as Water-Sprinkling Festival, temple fairs, traditional music or acrobatic shows. The circular plaza can be platform for Thadingyut Festival, beer carnival or open-air music concerts. The scales office is an important public building that can double as an art gallery or museum for small-scale exhibitions or receptions to showcase the cultural highlights of Myanmar, while large exhibitions can be hosted in the conference center or the banquet hall.

3.5.4 Landscape Planning

The waterfront spaces are a focus in the landscape design. Plenty of alfresco parasols, chairs, plant beds will adorn the lakeside walkway with an emphasis on breezy night-time leisure activities. The circular plaza will be hard paved. The ship docks are one of the best

places for appreciating the sunset with the elegant U Bein Bridge at the background. Sunset will be theme in the landscape design that invokes feelings of openness and cozy warmth. The commercial plaza landscape will emphasize a cultural theme, while the shop house blocks will feature local custom flavors.

3.5.5 Inner Road Circulation

The site embraces the lake in a long slender shape with only one entrance point connected to the municipal road. To alleviate the traffic pressure, an express way is planned longitudinally along the site to carry the traffic load in and out of the site. The express way is designed with features similar to a municipal road: some portions have 5 lanes in two directions, while the main potion will have 4 lanes in total in two directions, with one lane for speedy traffic at 50km/h. Crossroads are avoided as much as possible; T junctions will be the main junction from on the express way. For greater flexibility, no median strip will be set up, but turnaround points will be specified.

Except for the express way, other roads will carry vehicular-pedestrian mixed traffic at 15km/h with surface parking. Measures to slow down traffic include; speed bumps, zebra crossings, curved roads, traffic control signage, etc.

3.5.6 Elevations Planning

The dry and wet season water levels of Taung Thaman Lake are 695 ft and 699 ft respectively. The flood level of 2004 reached 700.5 ft; therefore, the main road elevation is set as 701 ft, and all indoor elevations will be 701 ft. The reference outdoor elevation is 700.5 ft with some local spaces set lower. The landscape spaces will be between 695 ft and 699 ft. The sewage treatment plant will be situated in the middle of the site to collect gravitational drainage from the north and the south parts of the site. The pipeline elevation will be as low as 694 ft.

Most existing site elevations are lower than the above design elevations, therefore a large amount of earth fills will be made. After the earth fills operation, the site will be generally flat with just some deliberately designed local elevation varieties.

3.6 Project Architectural Design

The community buildings focus on human-scale designs, aiming for a high-quality living style with rich spatial and visual experiences. The Shop House buildings' convenient access and physical separation from commerce get the best of both worlds. Many semi-outdoor spaces and sun shade features are provided to combat the scorching climate of Mandalay.

As part of the implementation process, the Department of Archaeology and the National Museum Department have conducted two field inspections. Currently, they are adhering to the 11 instructions outlined in the inspection report. Additionally, buildings are being constructed in accordance with these instructions, with a height limit not exceeding 40 feet.

3.6.1 Shop House Buildings Design

- The house plans feature clear functional divisions; most houses can enjoy four-sided daylight and natural ventilation for energy-efficient housing.
- Every household will have a front yard with at least two parking spaces and a private backyard. Every room will have natural lighting and ventilation.
- There will be sightline intrusions or interruptions among different houses. Every unit will have a viewing balcony. Equality, privacy and safety will be emphasized in the design.
- Outdoor natural scenes including the far lake views and close community garden views will be admitted indoors.
- The residential facades will adopt a light-weight and colorful style integrated with traditional Burmese elements to create a community lively with Southeast Asian flavors. Large windows in the façade will provide nice views and add pleasant modern touch to the traditional style.

1. 

3.6.2 Hotel Design

The resort hotel room will be distributed separately on six buildings each with its own small garden. The public hotel functions will be housed in another building at the front. The open lobby, open-air banquet area, scenic swimming pool, villa-style guest rooms and tranquil walk

lanes transport the guests to a totally relaxed vacation experience different from that offered by downtown hotels.

3.6.3 Banquet Hall and Conference Center Design

The banquet halls complex is the largest building of the project, which will be able to host 1900 banqueting people at the same time. The banquet hall complex can serve as avenue for local people's wedding ceremony and other festivities . The building will also become the grandest venue for marriage banquets in Mandalay. The conference center projects into the lake like an island and will be the project's most prominent landmark, and functionally ameliorate the lack of conferencing venues in Mandalay.

In order to operate the conference center within the market mechanism, it is spatially grouped together with the neighboring banquet complex and hotel. The conference center will be designed to meet the standards of a professional venue, including a seating capacity of 300-500 people, with advanced functional facilities and professional audio-visual equipment, as well as dining and lodging amenities.

Besides, from the overall planning perspective, the conferences center is positioned as a conference complex' with exhibition, recreation, cuisine, shopping, fitness and cultural facilities to achieve a balance between social and economic benefits.

The banquet hall, conference and hotel will have independent access routes for flexible operations.

3.6.4 Shop Type

The Shop Types are arranged in pairs with their back gardens adjoined, so that the shop fronts will face the commercial street while the back gardens willl enjoy residential quietude. The community buildings focus on human sacle designs, aiming for a high-quality living style with rich spatial and visual experiences. The residential buildings' convenient access and physical separation from commerce get the best of both worlds. Shophouses where the 1st and 2nd floors are used for commerce to serve domestic tourist, international tourists and local community.

3.7 Structural Design

3.7.1 Natural Conditions

(1) Reference wind pressure: the main structure is designed to with stand a 50-year return period wind pressure of 0.30KN/m^2.

(2) Reference snow pressure: 0.00KN/m^2.

(3) The earthquake reference magnitude is VIII. The design basic acceleration of ground motion is 0.20g, grouped under group 3 of the main cities' earthquake groups.

(4) Refer to the geotechnical report for the site's geotechnical conditions.

3.7.2 Structural Loads

The floor and roof live load values, deigned according to the Load Code for the Design of Building Structures, are as follows:

- Bedroom, living room, dining room, kitchen: 2.0KN/m^2
- Entry garden: 3.0KN/m^2
- Bathroom, balcony: 2.5KN/m^2
- Elevator lobby: 3.5KN/m^2
- Evacuation stairs: 3.5KN/m^2
- Elevator mechanical room; 7.0KN/m^2
- Garage: 4.0KN/m^2
- Shops: 3.5KN/m^2
- Accessible roof: 2.0KN/m^2
- Inaccessible roof: 0.5KN/m^2
- Outdoor ground: 5.0KN/m^2 except for grounds accessible by fire engines.

3.7.3 Structural Design

(1) The project's seismic protection belongs to category 3 and magnitude VIII.

(2) The residential buildings will adopt the frame structure and special-shaped-column frame structural systems. The frames' seismic protection grade is grade 2. The foundations will be generally supported by natural grounds, but adjustments will be made where necessary based on the geotechnical report.

3.8 Fire Protection Design

3.8.1 Architectural Discipline

The buildings of this project are classified as category-2 buildings. The residential buildings are designed with grade-2 fire resistance.

The fire lanes are laid out with an 80m service radius; cul-de-sac turnaround space will be provided for fire engines where necessary. The fire lanes will be at least 4m wide with a bearing capacity not less than 30 tons.

3.8.2 Water Discipline

3.8.2.1 Outdoor fire Hydrants water supply

The outdoor fire hydrants water supply pipelines will be merged with the outdoor residential water supply system. The hydrants will be spaced 120m apart on average and 150m apart on maximum. The hydrants' water supply rate is 40L/s, and the fire duration limit is set at 2 hours. The water consumption design rate is 288m^3/hr. The fire protection water tanks will be supplied with hydrant booster pumps (two pumps in total, one on duty and another on standby); outdoor suction wells will be provided.

3.8.2.2 Indoor fire hydrants water supply

(i) The indoor hydrants' water supply rate is 20L/s, and the fire duration limit is set at 2 hours. The water consumption design rate is 144m^3/hr. The fire protection water tank(s) will be supplied with indoor hydrant booster pumps (two pumps in total, one on duty and another on standby).

(ii) The indoor hydrants will be places at conspicuous positions; the hydrants' pressure should ensure that at least two fire hose nozzles fully filled with water at the same time can reach any indoor locations, and meet the fire protection code requirements.

(iii) The indoor hydrants water supply pipelines should be laid out in ring patterns both horizontally and vertically to ensure supply stability. Every hydrant and sprinkler system's water supply and water pressure will provide by 18m^3 roof water tank. The water tanks' installation heights should ensure that the most disadvantageously positioned hydrant will have a static water pressure not less than 10m.

(iv) The fire protection pump room (about 350m^2) will be provided on the stilt floor, the fire water tank will be 558m^3; a 18m^3 fire water tank will be place at the highest roof.

3.8.2.3 Automatic Sprinkler System

(i) The banquet complex and shopping center's automatic sprinkling shall adopt a wet pipe system. The sprinkling rate is designed for a medium-danger grade-II standard at 81/min*m^2, with a coverage of 160m^2 lasting for 1h. The most disadvantaged sprinkler should have a working pressure of 0.05Mps. The design water flow is 351/s. The water will be supplied by automatic sprinkler booster pumps.

(ii) The water and water pressure during the breakout and duration of fires will be supplied by water towers and stilt floor pump room.

3.8.3 Electrical Discipline

3.8.3.1 Power Supply & Switching

Fire protection pumps, smoke extraction fans, automatic fire alarms, emergency lighting, evacuation lighting, domestic water pumps, fire protection elevators, sewage pumps etc. will have grade-1 workload. Other equipment will have grade-3 workload. The high-voltage power supply will be 10KV. The community will have generator set rooms. Greade-1 workload equipment will have duplicate power supply, with automatic switchover at the bottom-level electrical boxes. The fire protection equipments' cables should be fire-resistant.

3.8.3.2 Emergency Lighting

The commercial and banquet buildings will have emergency lighting in the stairways, anterooms, evacuation passages, mechanical rooms and garages. Evacuation signage will also be set up in the evacuation passages and exits.

3.8.3.3 Fire Alarm and Coordinated Control System

The sales office (reception center) will have a security and fire monitor room on the first floor. The transformer rooms, generator set rooms will be furnished with temperature and smoke sensors. Manual fire alarm buttons will be installed at corridors and exits. Fire protection intercoms will be installed at fire protection pump rooms, transformer rooms and smoke extraction mechanical rooms. When fire alarms are confirmed, the fire protection coordination system should perform the following functions: activate the fire protection pumps: turn off the regular ventilators and activate the smoke extraction ventilators in the fire areas; turn off non-fire-protection power supply in the areas and control the forced landing of elevators. Apart from the main circuit control of the fire protection pumps and smoke extraction fans, an independent manual control circuit will also be provided at the fire protection control room.

3.8.3.4 Smoke containment and ventalitation

- Smoke-proof stairs and combined anterooms without natural ventilation in the commercial and banquet buildings will have mechanically pressurized smoke proofing systems. A pressurized intake vent with opposed blade damper will be installed at every two floors in the smoke-proof stairs; when fire alarms are activated, all vents will be opened immediately.
- The banquet hall's stilt floor will have mechanical smoke ventilation. Under normal conditions, the smoke ventilators will be used for regular air ventilation. 280°C fire dampers will automatically shut off and the related ventilators will also be turned off. For fire compartments with direct vehicular passage to the open air, replacement air will be naturally supplied at the stilt floor garage entrance. The air intake volume should be greater than the 50% of the smoke extraction volume. For fire compartments without direct passage to the open air, mechanical intake ventilators will be installed; the air feed will be taken in from vertical air shafts; the air intake volume should be greater than the 50% of the smoke extraction volume.
- The turn-on and turn-off of all smoke ventilators, pressurized intake ventilators should be signaled to the fire protection control room.

3.9 Energy Efficiency Design

3.9.1 Architectural Discipline

(1) The buildings are laid out from north to south in a linear pattern aligned with the prevailing wind directions.

(2) The forms of all buildings are kept as regular as possible to lower the building's shape coefficient.

(3) The use of glass will be limited to reduce energy loss, while meeting the daylight and natural ventilation requirements.

3.9.2 HVAC Discipline

(1) The HVAC design will integrate with the architectural design to ensure the building envelope' thermal performance will meet the design code requirements.

(2) The mechanical ventilation system will be made up with low-noise equipment that satisfy the national standards for energy efficiency.

3.9.3 Water Supply and Drainage Discipline

All water supply and drainage equipment will be eco-friendly products. Equipment generated waste gas and noise will be accompanied with waste gas and noise treatment facility. Domestic sewage will enter the sewage treatment plant via a septic tank and drained to the environment after being processed to meet code standards. Oily sewage from restaurants and kitchen will be treated with grease traps. Dry fountains at the public plazas will adopt a water recycling system. Water-saving sanitary fixtures will include dual flush toilets with 6.0L water tanks. Each residential unit will have its own water meter. The pressurized water supply will adopt variable-frequency drive equipment.

3.9.4 Electrical Discipline

- The electrical substations or transformer rooms and electrical shafts will be placed as near the load center as possible.
- Low-loss transformers will be used. Automatically adjusted reactive power compensation will be design at the low-voltage side of the substation to reduce transmission power loss.
- Energy-efficient lighting fixtures will be used to increase the power factor; lighting powers will be designed in strict accordance with the national standards.
- The mechanical loads consumed by ventilators and pumps etc… will be regulated with variable-frequency devices.

3.10 ENVIRONMENTAL PROTECTION DESIGN

3.10.1 Architectural Discipline

- The community will have central property management; vehicular traffic will be regulated to reduce impact on residents.
- (2) Residential garbage will be properly bagged and stored in every household's garbage receptor before being transported by property management to the community waste compaction station (integrated with sewage treatment plant).
- (3) There are no existing high-rise buildings around the site that would affect the community's day lighting. The spacing between buildings will meet the China's national code requirements on solar design.

3.10.2 Water Supply and Drainage Discipline

- The residential sewage system will separate black water from grey water drainage; kitchen sewage will be separated from toilet sewage.

- All water tank overflow pipes should be fitted with mesh screens; the manholes should be covered and locked.
- Sewage treatment plant and storm water collection pools will be provided.

3.10.3 HVAC Discipline

- Efficient low-noise ventilators will be used.
- Ventilators will be joined to ducts with flexible connectors.
- Intake and exhaust vents spacing and elevations will conform to China's national codes, and will be spaced apart as far as possible avoid air pollution.
- Diesel generator set smokes will be treated before discharge into high-altitude air.
- The smokes of residential kitchens will be fanned into the smoke shaft and discharged above roof. The smoke shafts will be embedded in architectural construction. The smoke extraction fans shall be installed by the residents themselves.

3.10.4 Electrical Discipline

- The standby generator set will be placed on the banquet hall's mechanical room enclosed with reinforced concrete structure and fitted with ventilation and sound attenuation devices. The diesel motor and the generator will be placed on the same axis on a platform supported with springs to isolate the vibration.
- The generator set's smokes will be treated before discharge through the smoke shaft. The heat dissipation air will be discharged through the vent shaft to outside of exterior wall.
- Vent mufflers and sound-absorbing materials on walls can be used to reduce the noise level of the generator set room can be lowered to meet the environment protection requirements.

3.11 Electrical Design

3.11.1 Electrical Systems

3.11.1.1 Estimated Loads

The residential electrical loads are calculated at the rate of 75W/m^2; commercial and related facilities' loads are calculated at the rate of 100W/m^2. The total installed capacity is 9972KVW; the calculated capacity is 5900KVA. 10 sets of 800KVA SCB11 dry transformers will be installed.

3.11.1.2 Types of Loads

Fire protection pumps, smoke extraction fans, automatic fire alarms, emergency lighting, evacuation lighting, domestic water pumps, fire protection elevators, sewage pumps etc. will have grade-1 workload. Other equipment will have grade-3 workload.

3.11.1.3 Power Source

The project will grade workload power supply. A municipal 10kV ring distribution line will be connected to the development's high-voltage substation. The transformers in the individual buildings will be connected to the 10kV electric cabinet. A 1000kV diesel generator set will be installed in an 80m^2 electrical room to provide for fire protection and emergency usages.

3.11.2 Telephone, Broad Band Internet, Cable Television Systems

The sales office (reception center) will include an ELV room to house the telephone, internet and cable TV equipment. Each residential unit will have on sheath of cables for telephone, internet and TV, wherein there be two cores for telephones. Large multicore cables will be connected to the community hub and twisted-pair cables will be connected to the user terminals. Internet connection to the community will be carried on single-mode or multi-mode fibers, and user terminals will have optical fiber connections. Televisions will be connected with coaxial cables.

3.11.3 Automatic Fire Alarm and Coordinated Control System

The sales office (reception center) will have a security and fire monitor room on the first floor. The transformer rooms, generator set room will be furnished with temperature and smoke sensors. Manual fire alarm buttons will be installed at corridors and exits. Fire protection intercoms will be installed at fire protection pump rooms, transformer rooms and smoke extraction mechanical rooms. When fire alarms are confirmed, the fire protection coordination system should perform the following functions: activate the fire protection pumps; turn off the regular ventilators and activate the smoke extraction ventilators in the fire areas; turn off non-fire-protection power supply in the fire areas and control the forced landing of elevators. Apart from the main circuit control of the fire protection pumps and smoke extraction fans, an independent manual control circuit will also be provided at the fire protection control room.

3.11.4 Lighting Protection Grounding

The development will have category 3 lightning protection. The building foundations will be used as natural grounding medium. The lightning protection, electrical appliances' operation

and protection ground lines will all be connected to the grounding medium. The grounding resistance should not be greater than 1 ohm.

3.12 HVAC Design

3.12.1 Air Conditioning Design

- Each residential unit will have split air conditioners installed with designated positions for outdoor units. The outdoor unit's condensation water will be drained in organized ways.
- The shops will also have split air conditioners installed; installation positions and power capacity will be reserved accordingly.
- The banquet hall will have central air conditioning.

3.12.2 Smoke Containment and Ventilation

i. Smoke-proof stairs and combined anterooms without natural ventilation will have mechanically pressurized smoke proofing systems. A pressurized intake vent with opposed blade damper will be installed at every two floors in the smoke-proof stairs; when fire alarms are activated, all vents will be opened immediately. Combined smoke-proof anterooms on each floor will have pressurized intake vent which is closed under normal conditions. When fire alarms break out, the closed intake vents on the fired floor as well as the two adjoining floors will immediately open up and the ventilators will be turned on to provide pressurized fair of smoke proofing.

ii. The banquet hall garage will have mechanical smoke ventilation at 6 ac/hr. Under normal conditions, the smoke ventilators will be used for regular air ventilation. 280°C fire dampers will be installed in front of the smoke ventilators; when smoke reach 280°C, the fire dampers will automatically shut off and the related ventilators will also be turned off. For fire compartments with direct vehicular passage to the open air, replacement air will be naturally supplied at the garage entrance. The air intake volume should be greater than the 50% of the smoke extraction volume. For fire compartments without direct passage to the open air, mechanical intake ventilators will be installed; the air feed will be taken in form vertical air shafts; the air intake volume should be greater than the 50% of the smoke extraction volume.

iii. Interior corridors longer than 20m will be equipped with mechanical smoke ventilation system. The vent volume is designed at $60m^3/m^2*h$.

iv. Transformer rooms and pump rooms will also have ventilation systems. The generator set rooms and transformer rooms, equipped with gaseous fire extinguishers, will have

their ventilators and fire dampers automatically shut down. After the fires are extinguished, the ventilators and fire dampers can be remotely activated for post-fire ventilation.

v. The turn-on and turn-off of all smoke ventilators, pressurized intake ventilators should be signaled to the fire protection control room.

vi. Openings for ventilation fans will be embedded for the residential and commercial toilets in the architectural drawings.

vii. Residential kitchens will have smoke shafts with backflow prevention design.

3.12.3 Plumbing Materials and Insultation Requirements

i. All vent ducts will be made of galvanized steel sheets at the required standard thickness. All vent grilles will be made of aluminum alloy. The intake vent will be fitted with a regulating valve, the vent grilles' color shall be determined by the interior designer.

ii. Smoke ventilators concealed in the false ceilings shall be properly insulated.

3.13 Water Supply and Drainage Design

3.13.1 Water Resources

The primary water source for our project will be sourced from underground reserves. The proposed project will utilize an 8-inch pipe system connected to a 300,000-gallon water reservoir equipped with two wells. This reservoir serves to settle sediment and minimize the use of chlorine in the water treatment process. All structures within the project, including the buildings, ground tanks, and the Shop House, will feature 1,600 -gallon water storage facilities. Specifically, the hotel, wedding hall, and conference halls will be equipped with 4,000-gallon water tanks, ensuring reliable water supply. Water distribution will be facilitated by an auto pressure pump system.

Prior to implementation, the proposed project conducted thorough testing of the underground water quality, and we have received confirmation from the Mandalay City Development Committee that it meets the standards for drinking water. For the whole project anticipates a daily water requirement of 800 cubic meters, a figure that guides our planning and management of water resources.

3.13.2 Design Scope

(i) Indoor and outdoor water supply, drainage and storm water systems

(ii) Fire protection system:

- Indoor and outdoor fire hydrant water supply;

- Public building automatic sprinkler system;
- The fire extinguishing system for important electrical rooms shall be designed and constructed by specialist fire protection design companies. Landscape design and storm water recycling shall be designed by landscape designer commissioned by the client, and we will provide the necessary assistance.

3.13.3 Domestic Water Supply

(i) Water source for this project will be underground water supplied by pumping rooms and delivered by outdoor ring pipelines to ensure water supply stability. The water supply pressure will be 0.30 MPa.

(ii) Water supply volume: the peak domestic water supply volume is 600m^3/d. The peak hourly water supply volume is 31.0 m^3/h.

(iii) Means of delivery

- The water supply delivery system will be made up with water wells, pressurized pumps, water powers and user pipe connections.
- The vertical division will be designed based on the criteria that the static water pressure at the lowest-positioned sanitary fixture will not be greater than 0.45 MPa.
- Two 80 m^2 domestic pump rooms and two 80m^3 domestic water tanks will be built.

3.13.4 Drainage System

(1) Drainage volume: daily peak volume is 335m^3/d, peak hourly volume is 31.0 m^3/d.

(2) Black and grey waters will separately drained.

(3) A sewage treatment plant will be built. Domestic sewage will enter the sewage treatment plant via a septic tank and drained into the lake after being processed to meet code standards.

(4) Some storm water will be collected for landscape irrigation after some simple treatment; other storm water will be drained directly into the lake.

(5) The condensation water of air conditioners will be drained in organized ways.

3.14 Swimming Pool

The 20 m x 15 m swimming pool will be installed at the hotel area. The type of structure will be reinforced concrete (R.C) structure. Filtration system will be used as the water treatment

system for the swimming pool. A balancing tank will be located at beside the swimming pool, right beneath the swimming pool. The required water volume for the swimming pool is 600 m^3.

The filtration system for a swimming pool consists of several components that work together to maintain clean and clear pool water. Here's how the system typically operates:

Circulating Pumps: They are responsible for continuously moving the pool water through the filtration process. The pump draws water from the pool, passes it through the filtration system, and then returns the clean water back to the pool.

D.E Filters (Diatomaceous Earth Filters): They use a fine, porous powder made from diatomaceous earth to trap and remove small particles and debris from the pool water. As water passes through the D.E filter, the tiny pores in the D.E material capture impurities, allowing only clean water to pass through.

Salt Chlorination System: A salt chlorination system is used to sanitize the pool water by producing chlorine on-site. The system consists of a salt cell or generator, which electrolyzes the salt in the pool water to produce chlorine gas. The chlorine gas dissolves in the water, effectively sanitizing the pool and killing harmful bacteria and algae. The advantage of a salt chlorination system is that it provides a steady and consistent supply of chlorine, eliminating the need for manual chlorine dosing.

3.15 Project Activities

This project will consist of four phases, and Taung Thaman Thitsar Company Limited will be fully responsible for building the shophouses, hotel, conference center and so on, in line with the design codes the Myanmar National Building Code 2022.

3.15.1 Pre-Construction Phase

The pre-construction phase for this project involves essential planning, preparation, and regulatory steps that need to be completed before the actual construction can begin. This phase is critical in laying the foundation for a successful and well-executed construction project. In this phase, the activities are mostly performed as paper works. The key activities of the Taung Thaman Resort project are as followed;

1. Project Planning
2. Design and Permits
3. Contractor Selection
4. Project Schedule

5. Procurement Plan and Material Selection
6. Environmental Management Plan.

3.15.2 Construction Phase

The construction phase will be prolonged for 11 years. The activities started in June, 2014 and it is expected to end in 2025. Various construction works will be done during this period. The generic presentation of the construction activities which will take place in this project are as followed:

3.15.2.1 Site Preparation

The first step in site construction work will involve the grading of the site. Grading is defined as any operation consisting of excavation, filling, or a combination thereof. The grading process for the construction of TTMTS Project could include some or all of the following alternatives:

1. Easements. The first step in the grading operation is to determine the location of any on-site utilities and easements. The on-site utilities and easements often need protection so that they are not damaged during the grading operation.
2. Clearing, Brushing, and Grubbing. Clearing, brushing, and grubbing are defined as the removal of vegetation (grass, brush, trees, and similar plant types) by mechanical means. It is important that this debris be removed from the site and not accidentally placed within the structural fill mass.
3. Cleanouts. This grading process deals with the removal of unsuitable bearing material at the site, such as loose or porous alluvium, colluvium, peat, muck, and uncompacted fill.
4. Scarifying and recompacting. In flat areas that have not been benched, scarifying and recompacting of the ground surface is performed by compaction equipment in order to get a good bond between the in-place material and compacted fill.

3.15.2.2 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, material storage, and runways, and accelerating and braking forces from buggies and other 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.

3.15.2.3 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.

3.15.2.4 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 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.

3.15.2.5 Carpentry work

Carpentry works will take place in doors, windows, and other 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.

3.15.2.6 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.

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 ESIA team recommends that every choice must be made for using environmentally friendly materials.

3.15.2.7 Finishing

Finishing operations include installation of the ceilings, tile, wallboard, wall paneling, air-conditioning equipment, cooling devices for rooms, escalators, floor coverings, window glass, movable partitions, finishing hardware, and other items called for in the drawings and specifications. 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 building. The site is landscaped and paved. Finally, the building interior is painted and cleaned.

3.16 Green Spaced or Landscaping

At Taung Thaman resort, they prioritize the strategic planting of various flowers throughout their landscape for two primary reasons: enhancing guest experience and promoting environmental sustainability. the strategic placement of flowers helps to define outdoor spaces, highlight focal points, and encourage exploration of their grounds.

In addition to, their landscaping efforts underscore their commitment to sustainability. Taung Thaman resort prioritize the use of native and drought-tolerant plants, including many of the flowers blooming throughout our grounds. By selecting species that require minimal water and maintenance, they conserve resources and reduce our ecological footprint while still providing a vibrant and colorful landscape. This dual focus on guest experience and environmental stewardship ensures that our floral displays not only enhance the ambiance of our property but also align with our values of sustainability and responsible stewardship of the natural environment.

The species and quantity of trees designated for planting in this project are detailed in Appendix (3).

3.17 Materials and Equipment

The construction of the proposed project will be required a considerable amount of construction raw materials. The generally required raw materials for the project's construction are shown in the following table. All these raw materials will be supplied by vendors, from the only local, in accordance with the MNBC guidelines and will be used for the construction activities.

A lot of machinery and equipment will also be required to successfully construct the building. The following is the list of equipment and machinery that will be used in the construction phase of this project;

Taung Tha Man Thit Sar Company Limited

List of Machineries, Equipment and Others to be purchased in local

Exhibit-2-1

Sr No.	ITEM NAME	Unit	Qty	Unit Price	Amount
	Machineries				
1	But Welder	Unit	8	2,440,800.00	19,038,240.00
2	Bending Machine	Unit	8	788,400.00	6,149,520.00
3	Steel Bar Straightening Machine	Unit	8	2,440,800.00	19,038,240.00
4	Steel Bar Cutting Machine	Unit	8	3,098,400.00	24,167,520.00
5	Steel Bar Set of Silk Machine	Unit	4	2,816,400.00	11,828,880.00
6	Welding Machine	Unit	40	243,600.00	9,792,720.00
7	Air Compressor	Unit	20	1,126,800.00	22,310,640.00
8	Intercon	Unit	160	66,000.00	10,573,200.00
9	Tower Crane (C 5510)	Unit	8	157,946,000.00	1,232,018,800.00
10	Tower Crane (C 5510)	Unit	4	157,946,000.00	663,333,200.00
11	Construction Elevator	Unit	12	30,076,800.00	360,921,600.00
12	Pump Pipe	Unit	4004	19,200.00	76,884,480.00
13	Slump Pipe Accessories	Unit	1201	2,400.00	2,882,880.00
14	Pumping Station (HTB 60)	Unit	8	5,634,000.00	43,945,200.00
15	Material Spreader (HGY 18)	Unit	10	2,253,600.00	22,986,720.00
16	Planer	Unit	12	1,878,000.00	22,536,000.00
17	Commercial Elevator	Unit	56	60,093,600.00	3,353,222,880.00
18	Service Truck	Unit	6	17,433,350.00	104,600,100.00
19	Service Car (Lexus LX 570)	Unit	4	119,262,400.00	429,624,640.00
20	Business Purpose Vehicle (Toyota Camry XLE Hybrid)	Unit	4	40,265,600.00	145,024,160.00
	Total				6,580,879,620.00

Taung Tha Man Thit Sar Company Limited

Hotel Equipment to be purchased in local

Exhibit -2-2

Sr.No	Particular	Unit	Qty	Rate	Amount (Kyat)
1	Complete Shower Room	Set	96	1,183,104.00	113,577,984.00
2	Yakeli Bath Crock	Set	96	368,076.00	35,335,296.00
3	Assorted Ambry	Set	96	1,201,872.00	115,379,712.00
4	Lampblack Machine	Set	96	469,488.00	45,070,848.00
5	Siamese Toilet	Set	96	563,376.00	54,084,096.00
6	Basin	Set	96	86,388.00	8,293,248.00
7	Basin Face Ark	Set	182	300,468.00	54,685,176.00
8	Sprinkler	Set	182	75,120.00	13,671,840.00
9	Faucet	Unit	4,230	52,584.00	222,430,320.00
10	Mirror	Unit	96	22,536.00	2,163,456.00
11	Toilet Paper Box	Unit	96	15,024.00	1,442,304.00
12	Bed	Set	184	751,176.00	138,216,384.00
13	Bedside Table	Set	368	300,468.00	110,572,224.00
14	Matress	Unit	184	65,724.00	12,093,216.00
15	Bedding	Set	184	751,176.00	138,216,384.00
16	Sofa	Set	96	3,004,692.00	288,450,432.00
17	Table	Unit	96	300,468.00	28,844,928.00
18	Telephone	Unit	96	37,560.00	3,605,760.00
19	Carpet	m2	4,443	28,164.00	125,132,652.00
20	Tea Table	Set	96	563,376.00	54,084,096.00
21	Wardrobe	Set	276	1,802,820.00	497,578,320.00
22	Television	Unit	96	563,376.00	54,084,096.00
23	Curtain	Set	96	90,144.00	8,653,824.00
					2,125,666,596.00

3.18 Employment

The construction period and operation will create employment opportunities for a significant number of workers. The workers who will be working on the construction and operation phase are local. With an estimated peak workforce of 100–120 individuals per day and an 8-hour workday, and as most workers will return to their homes after working hours, the project does not need to arrange the dormitory, but there will be a camp for the workers to take a rest.

Moreover, the project will provide job opportunities for skilled and unskilled workers in various fields. Some of the potential employment opportunities include:

- For the Construction Phase

Sr.	Description	Quantity
1.	Construction Workers	12
2.	Carpenter	5
3.	Surveyor	2
4.	Digger	5
5.	Masons	5
6.	Smith	5
7.	Painter	1
8.	Supervisors and Managers	2
9.	Engineers and Architects	5
10.	Administrative Staff	3
11.	Security Personnel	20
12.	Transport and Logistic Workers	4
13.	General Services Workers (e.g Cleaner)	6

The proposed project could create opportunities with the ultimate number of 70 permanent staff in the construction phase.

- For the Operation Phase

Sr.	Description	Quantity
1.	General Manager	1
2.	Deputy General Manager	1
3.	CFO	1
4.	Account Manager	1
5.	Accountant	2
6.	Cashier	3
7.	Cost Control Manager	2

Sr.	Description	Quantity
8.	Cost Control Officer	3
9.	Development Department Manager	1
10.	Development Worker	3
11.	HR and admin Manager	1
12.	Receptionist	1
13.	Property Management Manager	1
14.	Property Management Officer	4
15.	Marketing Manager	1
16.	Marketing Staff	5
17.	Secretary	2
18.	Cleaning and Maintenance	15
19.	Security	25
20.	Driver	2
Total		75

The proposed project could create opportunities with the ultimate number of 75 permanent staff in the operation phase.

3.19 Fuel Utilities

The energy as the fuel, the diesel will be used for the construction machinery such as excavator, vehicles, and generators. The estimated requirement amount of fuel is 15 gallons per day, and it will be bought from the nearest gas station. Moreover, this fuel will only be vehicles so that the fuel will not be stored at the project site.

For the operation phase, there will not be much need for fuel, but only for generators.

3.20 Solid Waste Generation

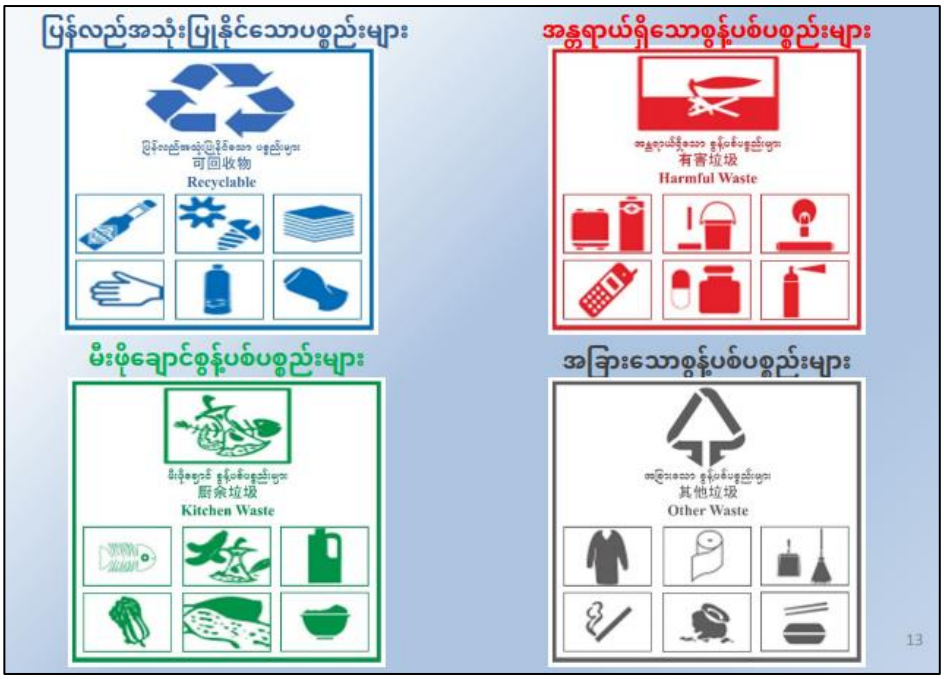
During the construction phase, solid waste generation typically includes materials like concrete, wood, steel, bricks, plaster, plastics, and packaging materials. These wastes can arise from various construction activities, such as demolition, excavation, and construction of structures.

Solid waste generation mainly consists of various material used during the construction process. Solid waste generation including hazardous waste in this phase may include concrete

and masonry waste: concrete debris and bricks form demolition or excess materials, wood waste: Scraps and discarded lumber from framing, formwork, and finishing works, metal waste: Steel scraps, pipes, and other metal components, plastic waste: packaging materials, PVC pipes, and other plastic construction items, from drywall and plasterboard installation and demolition.

During the operation phase, the solid waste generation of resort, restaurant and hotels primarily includes various types of waste produced by households on a daily basis. Some common types of solid waste generated are Organic waste: Food scraps, fruit and vegetable peels, garden waste, and other biodegradable materials, Paper waste: Newspapers, magazines, cardboard boxes, and other paper-based products, Plastic waste: Plastic bottles, containers, bags, and packaging materials, Glass waste: Glass bottles and jars from beverages and food products, Metal waste: Aluminum cans, steel cans, and other metal containers, E-waste: Discarded electronic devices and appliances, such as old computers, phones, and small electronics, Textile waste: Old clothing, linens, and other textiles that are no longer in use, Hazardous waste: Batteries, and other hazardous household chemicals like detergents.

On average, an individual in a typical person might generate anywhere from approximately 0.9 to 1.3 kilograms of solid waste per day. All the solid waste will be collected every day, stored temporarily at the disposal area, and then disposed of in the directory of the MCDC waste collection point. Moreover, in order to improve waste segregation practices, the project will conduct to be enough garbage bins to segregate waste with the color within the project area. In addition, there will be awareness posters on waste segregation and disposal at every trash bin.



3.21 Air Emission Generation

3.21.1 Construction Phase

During the construction phase, the construction of a building can generates various air emissions due to the use of heavy machinery, construction equipment, and materials. Some common air emissions during the construction phase include: Particulate Matter (PM): Dust and particles generated from activities such as excavation, demolition, and material handling can become airborne and contribute to PM emissions, Nitrogen Oxides (NOx): NOx emissions can arise from the combustion of fuels in construction machinery, such as diesel engines, Sulfur Dioxide (SO2): SO2 emissions can occur from the burning of certain fuels used in construction equipment and machinery, Carbon Monoxide (CO): CO emissions can result from incomplete combustion of fuels in construction vehicles and equipment, Benzene and other hazardous air pollutants: Certain construction activities and materials may release hazardous air pollutants like benzene, formaldehyde, and other toxic substances.

3.21.2 Operation Phase

During the operation phase, Air emissions from residential building and hotels are mainly associated with the energy consumption and daily activities of occupants. Some common sources of air emissions in residential buildings include: Combustion emissions: These emissions arise from the burning of fuels for heating, cooking, and other household purposes.

3.22 Wastewater Generation

3.22.1 Construction Phase,

During the construction phase, wastewater generation occurs mainly from activities that involve the use of water. Some of the key sources of wastewater in the construction phase include: Concrete and mortar mixing: Water is used to mix concrete and mortar, and the excess water that does not become part of the mix becomes wastewater, Construction equipment and

machinery: Wastewater can be generated from the washing and cleaning of construction equipment and machinery, Site dewatering: Construction sites often require dewatering to remove excess water from excavations, trenches, or basements, which can result in wastewater, Dust control: Water is sometimes used to control dust on construction sites, leading to wastewater generation, Cleaning and sanitation: Water is used for cleaning construction areas and providing sanitation facilities for the workers, resulting in wastewater. All these wastewaters will be primarily collected to be sedimented at the temporary sedimentation tank before being discharged.

3.22.2 Operation Phase

During the operation phase, the amount of wastewater generated per person in a household can vary based on factors such as water usage patterns, the number of occupants in the house, and the availability of water-efficient fixtures. On average, a typical individual in a household might generate around 80 to 100 gallons (approximately 300 to 380 liters) of wastewater per day. All the wastewater from the household will enter the wastewater treatment system, and will be treated.

In generally, the main types of wastewaters generated in residential buildings are Greywater: This type of wastewater comes from non-toilet fixtures and appliances, such as sinks, showers, bathtubs, and washing machines. Greywater does not include sewage from toilets and is relatively less contaminated than blackwater, Blackwater: Blackwater is wastewater from toilets and contains human waste and other organic matter, Kitchen wastewater: This wastewater comes from kitchen sinks and dishwashers and typically contains food particles, oils, and detergents, Laundry wastewater: This type of wastewater is generated from washing machines and contains detergent residues, lint, and other laundry-related substances.

3.23 Wastewater Treatment System

The project will conduct the sewage wastewater treatment system with the Kubota FRP Johkasou technology for wastewater including kitchen, toilet, laundry, and bathroom sewage. FRP Johkasou tanks installed more than 35 years ago are currently still in operation in Japan according to an investigation held by Ministry of the Environment, Government of Japan.

The septic tank with wastewater treatment system will be installed at the project when it's about to start the operation phase. The tank with the flow rate of 1.0 – 2.0 cubic meter per day features various functions such as anaerobic, aerobic, sedimentation and disinfection. This flow rate is completely sufficient for the wastewater produced by the family for 2 persons to 6 persons. The output of the treatment of wastewater is as same quality as a centralized sewage system. BOD removal ratio > 90% effluent BOD<20 mg/l.

Johkasou has the circulation system and makes it possible to repeat nitrification and denitrification process. This provides the advanced treatment for the wastewater. The water produced from wastewater treatment will undergo regular testing and measurement. Subsequently, it will be stored in fire water storage tanks. Additionally, trees and flowers will be repurposed for sprinkler systems and dust control measures. The sludge generated from the wastewater treatment plant will be appropriately disposed of in designated locations as per the instructions provided by the Mandalay Municipal Development Committee. The detail flow process and layout diagram is described as follows.

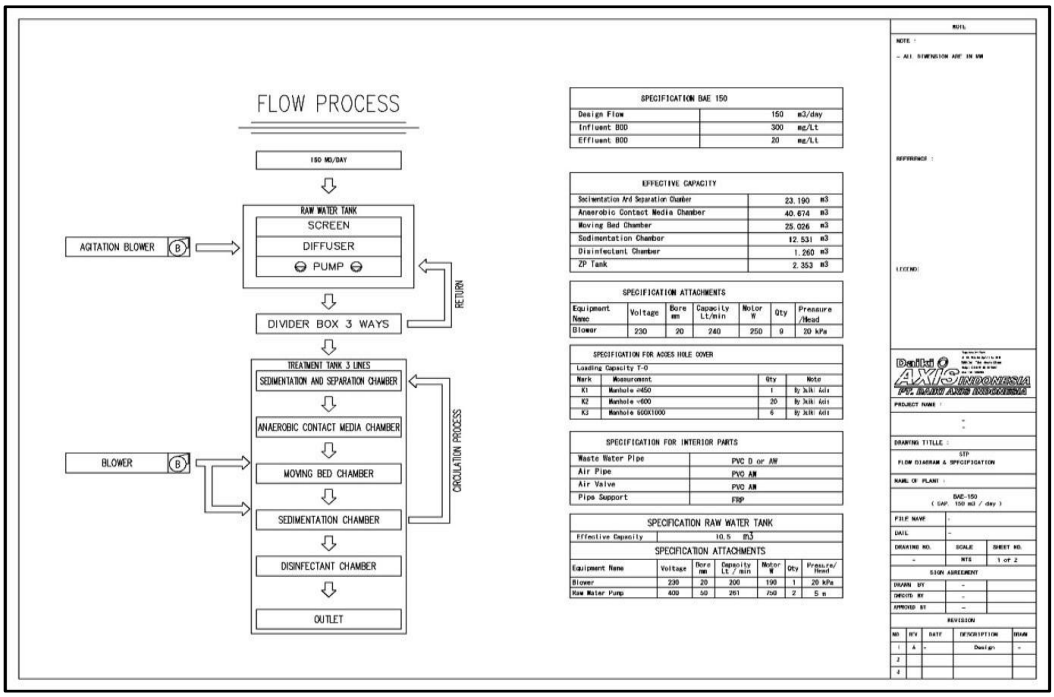


Figure 2. 3 Flow Process of Watertreatment System

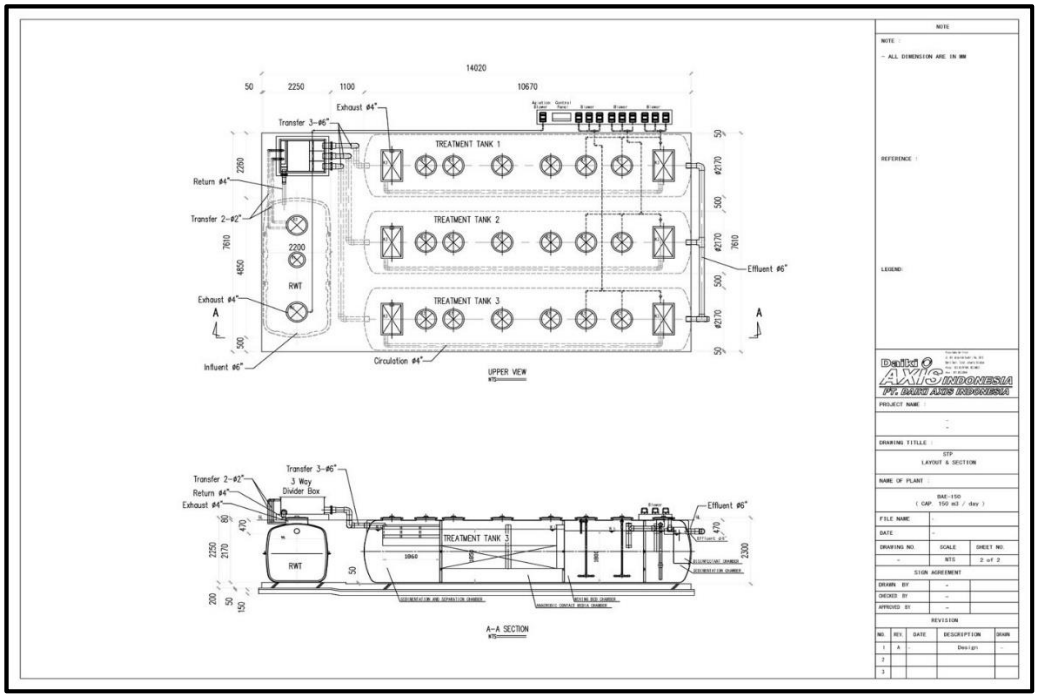


Figure 2. 4 Cross-section of Watstewater treatment

4 DESCRIPTION OF THE SURROUNDING ENVIRONMENT

A comprehensive depiction of the environmental setting is a crucial element in an Environmental and Social Impact Assessment (ESIA) for a proposed project. It encompasses the physical, biological, socioeconomic, and cultural aspects, establishing a baseline for assessing impacts. This involves detailing the current conditions and predicting future scenarios without the proposed project. The baseline serves as a guide, directing attention towards key environmental and socioeconomic factors, understanding how the project may influence them, and devising strategies to avoid or mitigate potential issues.

4.1 Geology, Hydrogeology and Soils

As part of the ESIA study, specialist geological input is required in order to identify potential environmental impacts on the geological environment within the study area. The following broad scope of work has been given:

- Carry out a desk study of available information pertaining to the geology and physical aspects of the study area;
- Prepare a brief report which describes the location, physical characteristics and geology of the study area and identifies potential environmental impacts on the geological environment that are likely to be associated with the proposed activity.

4.1.1 Limitation

Information provided in the specialist report has been based on information provided by the developer, published scientific literature and maps. The study area was visited to investigate geology, soil types and physical aspects of the study area. There is no detailed geotechnical investigation (trial pits, soil testing) or verification of the existing geological mapping was conducted. This report is generally discussed the potential environmental impacts on geological environment in study area. The information provided in this report is deemed adequate for the Geology Section of the EIA Report.

4.1.2 Topography and Meteorology

The study area is located on the Southeast Bank of Taung Thaman Lake, adjacent to the U Bein Bridge on the north. The study area is currently occupied by villages, uncultivated lands, fish ponds. Therefore, the topography is quite flat, with no major differences in altitude.

Mandalay experiences monsoon rains and is considered to be a tropical savannah, averaging 1,161 mm of rain annually, with the majority (91%) of this coming during the wet season (Harris et al. 2014). Mandalay observes three seasons: a wet season (May–October), a dry season (October–May), and a cold season (October–February). Temperatures throughout the year range from 13 to 39 °C with an average between 20 and 30 °C. Mandalay is subject to flooding during the wet season because of the intensity of the rain, its location in the Irrawaddy River flood plain, and higher rainfall rates in areas leading into Mandalay (Myitnge River/Irrawaddy River; Harris et al. 2014).

4.1.3 Climate Change Trend – Amarapura Township

The effects of climate change are already well visible by increasing air temperatures, melting glaciers and decreasing polar ice caps, rising sea levels, increasing desertification, as well as by more frequent extreme weather events such as heat waves, droughts, floods and storms. Climate change is not globally uniform and affects some regions more than others. On the following diagrams, you can see how cli- mate change has already affected the region of Amarapura during the past 40 years. The data source used is ERA5, the fifth generation ECMWF atmospheric reanalysis of the global climate, covering the time range from 1979 to 2021, with a spatial resolution of 30 km.

The data will not show conditions at an exact location. Micro-climates and local differences will not ap- pear. Therefore, temperatures will be often higher than those displayed especially in cities and precipita- tion may vary locally, depending on topography.

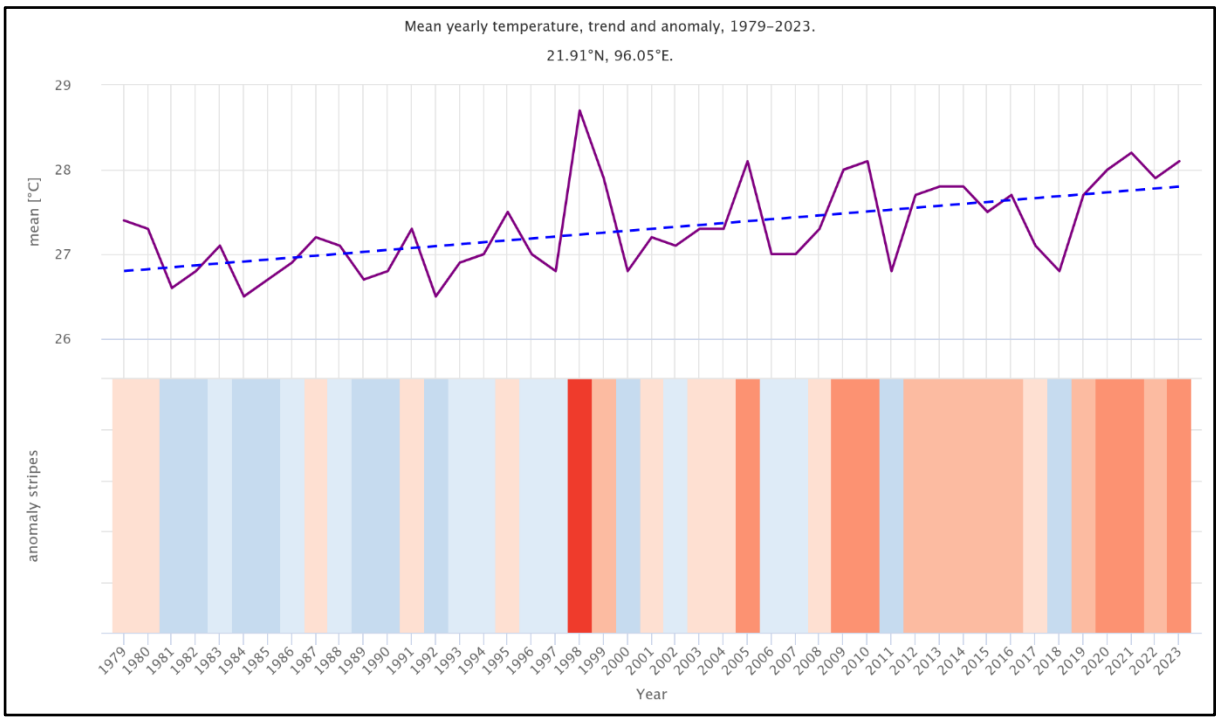


Figure 4. 1 Yearly Temperature Change – Amarapura Township

The top graph shows an estimate of the mean annual temperature for the larger region of Amarapura. The dashed blue line is the linear climate change trend. If the trend line is going up from left to right, the temperature trend is positive and it is getting warmer in Amarapura due to climate change. If it is horizontal, no clear trend is seen, and if it is going down, conditions in Amarapura are becoming colder over time. In the lower part the graph shows the so-called warming stripes. Each coloured stripe represents the av- erage temperature for a year - blue for colder and red for warmer years.

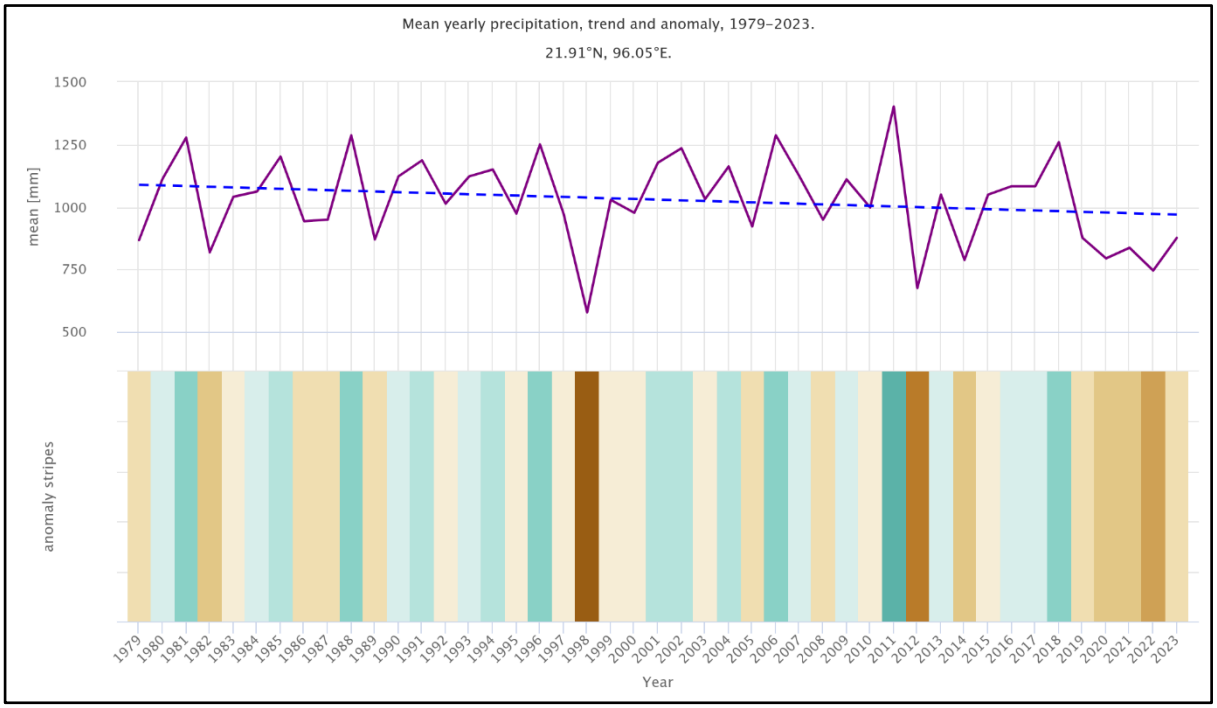


Figure 4. 2 Yearly Precipitation Change – Amarapura Township

The top graph shows an estimate of mean total precipitation for the larger region of Amarapura. The dashed blue line is the linear climate change trend. If the trend line is going up from left to right, the precipitation trend is positive and it is getting wetter in Amarapura due to climate change. If it is horizontal, no clear trend is seen and if it is going down conditions are becoming drier in Amarapura over time. In the lower part the graph shows the so-called precipitation stripes. Each coloured stripe represents the total precipitation of a year - green for wetter and brown for drier years.

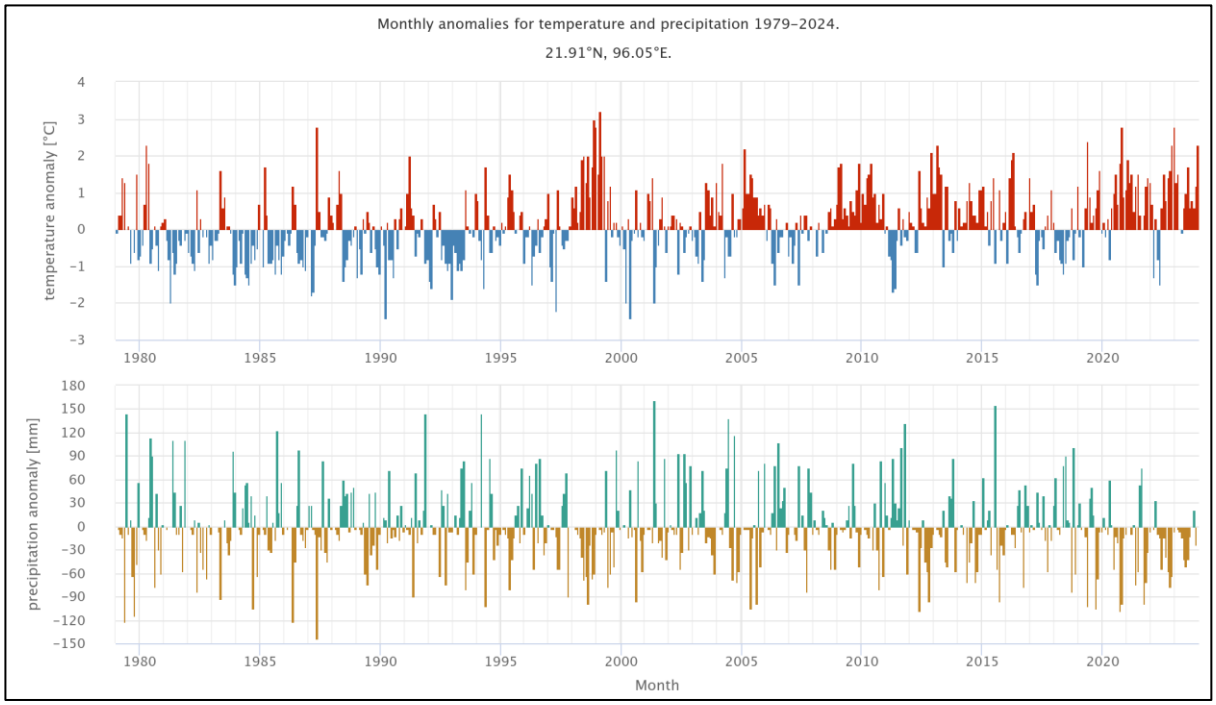


Figure 4. 3Monthly Anomalies of Temperature and Precitpitation Climiate Change – Amarapura Township

The top graph shows the temperature anomaly for every month since 1979 up to now. The anomaly tells you by how much it was warmer or colder than the 30 year climate mean of 1980-2010. Thus, red months were warmer and blue months were colder than normal. In most locations, you will find an in- crease of warmer months over the years, which reflects the global warming associated with climate change. The lower graph shows the precipitation anomaly for every month since 1979 up to now. The anomaly tells you if a month had more or less precipitation than the 30-year climate mean of 1980-2010. Thus, green months were wetter and brown months were drier than normal.

4.1.4 Geology and Hydrogeology

Mandalay is in an alluvial setting (Holocene Age) containing predominantly sands and gravels in a shallow aquifer, called the Amarapura Aquifer, from which most locals obtain their groundwater for cooking, cleaning, and drinking (Htay et al. 2014; Moe 2013). The Irrawaddy River is the major hydrologic feature in the area and its watershed extends into the Himalayas, whereas the Sagaing fault is an active strike-slip fault cutting north to south across the entire country and is located on the west side of the Irrawaddy River near Mandalay (Htay et al. 2014) The Shan Plateau is made of limestone formations containing predominantly calcite (CaCO3), with other mineral deposits including magnesite (MgCO3), barite (BaSO4), and various gemstones (Myanmar Ministry of Mines, Ministry of Education, Ministry of Industry 2017).

The Irrawaddy River starts in the Himalayas, running north to south and cuts west on the south side of Mandalay. The Irrawaddy River is approximately 2,100 km long, and its drainage

basin is about 414,400 km2 (Kravtsova et al. 2008). The Amarapura Township contains about 235,000 people and is located on the south side of Mandalay (UNDP 2014). Taung Tha Man Lake (TTML) is an oxbow lake in the middle of the Amarapura Township on the south side of Mandalay (Kyi 2005). Smaller streams from the Shan Plateau flow into TTML, and the Me-O Chaung is the outlet stream connecting TTML with the Irrawaddy River. The Myitnge River starts in the Shan Plateau, running east to west on the south side of the Amarapura Township, while the Shwe-Ta Chaung canal runs from Mandalay through the Amarapura region between TTML and the Irrawaddy River. The Shwe-Ta-Chaung canal is one of the larger discharges of wastewater from the city of Mandalay into the Irrawaddy River

Taung Tha Man Lake (TTML) is an oxbow lake formed by either the braided Irrawaddy River or the meandering Myitnge River, which contains channel and bar deposits (Kyi 2005). Thin layers of flood plain deposits from the Irrawaddy River are also deposited in this region during periods when the Irrawaddy overcomes its current bank. During these flood periods TTML serves as a back swamp to the Irrawaddy River (Kyi 2005).

4.1.5 Geology and Soil Type

The study area is located in the Mandalay City area, is demarcated by Ayeyarwaddy River in the west and Mandalay hills in the north. The soil conditions in the city vary from alluvial soils to stiff soils. The regional geology consists of Oligocene-Miocene igneous rock, Lower Paleozoic Metamorphic rock at Mandalay Hill in the north and the built-up area, Mandalay City, is mainly composed of recent Alluvium. In addition, the proposed area is located in recent alluvium.

Mandalay City (including project area) lies along the Saging fault which is dextral strike-slip fault of NS trending fault in Myanmar region. Besides, Mandalay City (including project area) is also located near Shan Scarp Fault which is rather linear, and dies out southward at the junction with the Three Pagoda fault. The anticipated seismic intensity of the Mandalay City (including study area) is located in destructive zone of Deterministic Seismic Hazard Map. The equivalent modified Mercalli Scale Classes are IX. The probable range of ground acceleration is 0.4 - 0.5 g values.

4.1.6 Soil Sampling Methodology

4.1.6.1 Objectives of Soil Sampling

Soil sampling for baseline data in environmental reports aims to characterize soil properties, assess contamination levels, evaluate soil quality, and detect degradation indicators. By establishing baseline data, these reports inform decision-making regarding risk

management, compliance with regulations, and the implementation of sustainable land management practices. Through systematic soil sampling and analysis, environmental reports contribute essential information for protecting soil health, while promoting responsible stewardship of natural resources.

4.1.6.2 Selection of Soil Sampling

The site selection process was guided by environmental studies and considerations of proximity to Taung Thaman Lake, as well as the planned earthwork activities for landscaping construction. Samples were collected preemptively, prior to these activities, to assess the potential impacts on soil contamination and erosion, particularly with regard to the lake's ecosystem. This approach allows for a proactive evaluation of environmental risks and informs decisions regarding mitigation measures and sustainable land management practices to safeguard the integrity of the surrounding ecosystem.

Table 4. 1 Location, Date and Time of Soil Sampling

No	Sampling	Coordinate Points	Location	Date
1.	Soil	Lat: 21°53'27.69"N Long : 96° 3'44.73"E	Near proposed Sin Swal Palace Construction	September, 07, 2022

Figure 4. 4 Location point of Soil Sampling

4.1.6.3 Soil Sampling

Samples are collected using soil auger tools to ensure accurate representation of soil variability, with multiple subsamples taken from selected points. The depth of sampling is determined by study objectives, typically ranging from surface layers (0-15 cm) to deeper subsurface layers (15-30 cm or more). Clean equipment, including gloves and bags, is utilized

during sampling, and each sample is carefully labeled with relevant information. After collection, samples are air-dried to remove excess moisture and properly packed for preservation in a dry environment. Finally, the samples are sent to the Soil Laboratory of the Land Use Department within the Ministry of Agriculture and Irrigation for analysis.

4.1.6.4 Soil Quality

A soil sample was gathered at the proposed project site (coordinates: 20°40'32.07"N and 96°28'47.97"E) to assess the present soil conditions. This sample underwent analysis for its physiochemical properties at the Soil Laboratory within the Land Use Department of the Ministry of Agriculture and Irrigation.

Descriptions	Observed Results	Contents
Moisture (%)	8.11	
pH (Soil:Water) 1:2:5	9.08	
Texture	37.24	Sand (%)
	19.34	Silt (%)
	43.42	Clay (%)
	100	Total (%)
Organic Carbon	0.13	
Humus (%)	0.224	
Total Nitrogen (%)	0.132	
Exchangeable cations	47.15	**Ca^{2+}**
	21.76	**Mg^{2+}**
	0.36	**K^{+}**
Available Nutrients	2.61	**P (ppm) (0)**
	16.99	**K_2O(mg/100gm)**

O = Olsen Method

Table 4. 2 Interpretation of Soil Quality Results

Description		**Results Interpretation**
pH (Soil:Water) 1:2:5		Extremely Alkaline
Texture		Clay
Organic Carbon		Very Low
Total Nitrogen (%)		Low
Exchangeable cations	**Ca^{2+}**	Very High
	Mg^{2+}	Very High
Available Nutrients	**P**	Low
	K_2O	Medium

Table 4. 3 Soil's 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

4.1.6.5 Data Interpretation

Below are the soil quality samples organized based on the conducted tests and measurements :

- **Soil Type:** The soil texture, composed of 37.24% sand, 19.34% silt, and 43.42% clay, indicates a clay loam soil type. Clay loam soils typically have good water and nutrient retention capabilities, making them suitable for various agricultural and horticultural purposes.
- **Moisture (%):** The moisture content of the soil is 8.11%. This indicates the amount of water present in the soil and can influence various soil properties such as nutrient availability and plant growth.
- **pH (Soil :Water 1:2:5):** The pH level of the soil is 9.08. This suggests that the soil is alkaline in nature. Alkaline soils can affect nutrient availability to plants, with certain nutrients becoming less soluble as pH increases.
- **Sand (%), Silt (%), Clay (%), Texture Total (%):** The soil texture is characterized by 37.24% sand, 19.34% silt, and 43.42% clay. Soil texture plays a crucial role in determining soil properties such as water retention, drainage, and nutrient availability.

- **Organic Carbon and Humus (%)**: The soil contains 0.13% organic carbon and 0.224% humus. Organic matter contributes to soil fertility, structure, and water retention capacity. It also serves as a reservoir for nutrients and provides a habitat for beneficial soil organisms.
- **Total N (%), Ca^{2+}, Mg^{2+}, K^{+}:** The soil has 0.132% total nitrogen content, 47.15 mg/kg of calcium (Ca2+), 21.76 mg/kg of magnesium (Mg2+), and 0.36 mg/kg of potassium (K+). These nutrients are essential for plant growth and development. Nitrogen is crucial for vegetative growth, while calcium, magnesium, and potassium play roles in various physiological processes within plants.
- **Phosphorus and Potassium oxide (K_2O):** The soil contains 2.61 ppm of phosphorus (P) and 16.99 mg/100 gm of potassium oxide (K_2O). Phosphorus is essential for root development, flowering, and fruiting, while potassium is involved in regulating plant water status, enzyme activation, and disease resistance.

4.1.7 Geological Assessment

The proposed activity may have certain impacts on the geological environment, and this need to be assessed as an integral part of the broader EIA study. The geological environment includes the parent rock and the soil overburden. Important or prominent geological features (geosites) that contribute to the aesthetic scenery of geological interest in the area, such as fossil sites, prominent rock outcrops or features must also be considered in the impact study. Geological features, such as caves, addits, middens, worship rocks, etc. which are important from heritage standpoint are not covered in this report as they are covered in the Heritage Impact Assessment.

4.1.8 Geosites

There are no fossil assemblages according to the previous literatures and there are no other known geo-sites within the study area.

4.1.9 Rock degradation

There would not be potential impact on rock degradation during construction activity because the study area lies alluvium unit and no outcrop are observed.

4.1.10 Soil degradation

Soil degradation is the removal, alteration or damage to soil and soil-forming processes which can be due to natural processes, such as erosion, or human influence during construction activity. The preservation of the natural soil is important to maintain environmental status.

Potential negative impacts relating to soil degradation are anticipated for the proposed activity. Such impacts include excavation, displacement or importation of soil, stockpiling, mixing, wetting, compaction and pollution of soil, soil erosion and sedimentation.

Soil erosion is the process of the lowering of the natural ground level by wind or water and may occur as a result of, inter alia, chemical process and/or physical transport on the land surface. Erosion potential is determined by the erodibility of the soil (type and structure), vegetative cover, topography, climate (rainfall and wind), and the nature of land-clearing. Soil erodibility potential is the erosion when soils are exposed to water (and/or wind) during or as a result of land-disturbing activities. Generally, soils with faster infiltration rates, higher levels of organic matter and improved soil structure have a greater resistance to erosion. Sand, sandy loam and loam textured soils tend to be less erodible than silt, very fine sand, and certain clay textured soils. Besides, erodibility potential is generally increased where low-plasticity, fine-grained, unconsolidated soils occur, such as Quaternary and Recent sediments. The soil characteristics of study are Quaternary recent soil. Water erosion potential is generally higher in areas of high relief and at the base of steep slopes where hydraulic energy is higher. The study area is quite flat, with no major differences in altitude. The climate of the study area is wet and dry seasons of nearly equal length, with the west season running from May through October and the dry season covering the remaining six months.

4.2 Water Quality

The baseline water quality in the region is determined by analyzing samples from two key locations: Taung Thaman Lake water and groundwater samples from the project site. The selection of these water sampling points is a crucial aspect of the environmental assessment, guided by considerations such as the project's geographical location, areas susceptible to sewage impact, and the configuration of the drainage and discharge system. The criteria for selecting these sampling points are as follows:

4.2.1 Ground Water Point Selection

For the Direct Impact Assessment : Groundwater is a primary source of drinking water and domestic water for the project which can be directly impacted by various activities. Sampling from the project site allows to assess the baseline quality of the groundwater and evaluate any potential contamination or changes caused by the project.

For Early Detection of Issues : By analyzing the groundwater from the project site, which can be identify potential issues early on. This is crucial for implementing timely corrective measures to prevent long-term damage to the groundwater quality.

For Compliance Monitoring : Monitoring groundwater quality is essential for ensuring compliance with environmental regulations and standards. It ensures that the project activities do not adversely impact local water resources.

4.2.2 Taung Thaman Lake Water body (wastewater discharged point after treated)

Receiving Environmental Assessment : Sampling from the lake that receives wastewater discharge provides insights into how the ecosystem of the receiving water body is impacted. This is important for understanding the potential ecological consequences of discharging wastewater into the lake.

Evaluation of Dilution Effects : The Taung Thaman Lake serves as the recipient for treated wastewater from the project site. By sampling from the lake, we can assess the efficiency of the water body in diluting and dispersing the discharged effluent. This assessment is crucial for understanding the potential environmental impact.

Assessment of Water Quality Changes : Comparing the water quality of the Taung Thaman Lake before and after the project's wastewater discharge allows to assess any changes in the lake's water quality, helping to understand the project's impact on the aquatic ecosystem.

Compliance with Standards : Monitoring the water quality in the receiving lake ensures that the discharged wastewater complies with environmental standards and regulations, preventing harm to the aquatic environment.

All water samples were analyzed for their physiochemical properties in ALARM Ecological Laboratory and the coordinates points, sampling photos and the results are as shown in below.

Table 4. 4 Location point, Date and Time of Water Sampling

No	Coordinate Points	Location	Remarks	Date
1.	21° 53’ 7.12” N 96° 03’ 44.08” E	Taung Thaman Lake,	The project will be discharged their final wastewater.	September, 7, 2022/ 11:00 AM
2.	21° 53’ 16.98” N 96° 03’ 46.4” E	Ground Water at Project Site	The project will be used the ground water for the domestic purpose.	September, 7, 2022/ 10:30 AM

Figure 4. 5 Water Sampling Point at Taung Thaman Lake

Figure 4. 6 Ground Water Sampling point at project site

Figure 4. 7 photo records of water sampling

4.2.3 Water Sampling Methodology

To collect water samples effectively, the team wear gloves to prevent contamination, choose clean water bottles, rinse them with the water to be samples, ensure that the sampling bottle is completely filled, leaving minimal air space at the top to minimize the risk of contamination, record the sampling date, location and time, securely seal the water bottles to prevent spillage or contamination during transportation. To maintain sample integrity, the collected water samples are stored in an icebox to mitigate quality changes caused by external temperatures. These samples are then promptly delivered to the ALARM- Ecological laboratory, ensuring arrival within 24 hours.

Table 4. 5 Observed values of ground water quality

No.	Parameters	Results	Units	National Drinking Water Standards	Remarks
1.	pH	7.7	S.U	6.5 – 8.5	Normal
2.	Temperature	21	°C	-	–
3.	Total Dissolved Solid	337	mg/L	1000	Normal
4.	Conductivity	0.6	mS/cm	-	-
5.	Hardness	112	mg/L	500	Normal
6.	Chloride	640	mg/L	250	Above the limit
7.	Nitrate	0.6	mg/L	50	Normal
8.	Aluminum	< 0.01	mg/L	-	Normal
9.	Cadmium	ND	mg/L	-	LOD = 0.01 mg/L
10.	Copper	ND	mg/L	-	LOD = 0.02 mg/L
11.	Iron	0.4	mg/L	1	Normal
12.	Lead	ND	mg/L	0.01	LOD = 0.1 mg/L
13.	Manganese	0.4	mg/L	0.4	Normal
14.	Potassium	36	mg/L	-	–
15.	Zinc	< 0.02	mg/L	≤ 3	Normal
16.	Total Alkalinity	740	mg/L	-	–

No.	Parameters	Results	Units	National Drinking Water Standards	Remarks
17.	Sulfate	383	mg/L	250	Above the limit
18.	Calcium	36	mg/L	≤ 200	Normal
19.	Magnesium	16	mg/L	-	Normal
20.	Total Coliform Count (MPN / 100 ml) (presumption test)	210	-	-	Most probable number method

***ND = Not Detected, * LOD = Lower Limit of Detection, * " – " = No reference Standard**

- **pH** – the pH level of 7.7 falls within the neutral range, indicating neither acidic nor alkaline conditions. This pH level is generally favorable for most aquatic life and generally not a cause for concern.
- **Temperature** – The water temperature of 21°C is within the range suitable for many aquatic organisms. However, significant deviations from natural temperature ranges could impact aquatic ecosystems.
- **Total Dissoived Soilds** – The TDS level (337 mg/L) is well below the guideline value of 1000 mg/L, indicating good water quality in terms of dissolved solids concentration.
- **Conductivity** – Conductivity measures the ability of water to conduct an electrical current, which is influenced by dissolved solids. A conductivity of 0.6 mS/cm suggests relatively low conductivity, indicating low levels of dissolved ions.
- **Hardness** – Hardness refers to the concentration of calcium and magnesium ions in the water. A hardness level of 112 mg/L suggests moderate hardness, which can influence the suitability of water for drinking and industrial purposes.
- **Chloride** – Chloride concentration of 640 mg/L indicates the presence of chloride ions in the water. High chloride levels can be indicative of pollution, salinity, or human activities such as road salt application.
- **Nitrate –** Nitrate levels of 0.6 mg/L are relatively low and generally acceptable. However, high nitrate levels can indicate contamination from agricultural runoff or sewage.
- **Aluminium – T**he presence of aluminum at such low levels (< 0.01 mg/L) is typically not a concern for water quality.
- **Cadmium** "ND" stands for "Not Detected," indicating that cadmium is not present at detectable levels in the water sample.

- **Copper –** Similarly, "ND" indicates that copper is not present at detectable levels in the water sample.
- **Iron –** Iron concentration of 0.4 mg/L falls within acceptable levels for most purposes. However, elevated iron levels can cause taste and staining issues.
- **Lead –** Lead is not detected in the water sample.
- **Manganese –** Manganese concentration of 0.4 mg/L is within acceptable levels for most purposes. However, high manganese levels can cause taste and staining issues.
- **Potassium –** Potassium concentration of 36 mg/L is generally acceptable and is an essential nutrient for plant growth.
- **Zinc –** Zinc is present at very low levels (< 0.02 mg/L), which is typically not a concern for water quality.
- **Total Alkalinity –** Total alkalinity of 740 mg/L indicates the water's capacity to neutralize acids. High alkalinity levels can buffer pH changes and support aquatic life.
- **Sulfate –** Sulfate concentration of 383 mg/L is within acceptable limits and is a common constituent of natural waters.
- **Calcium –** Calcium concentration of 36 mg/L is generally acceptable and contributes to water hardness.
- **Magnesium –** Magnesium concentration of 16 mg/L is within acceptable levels and contributes to water hardness.
- **Total Coliform count –** The total coliform count of 210 MPN/100 ml suggests moderate bacterial contamination. While not necessarily harmful, high coliform counts may indicate potential fecal contamination and the presence of pathogens.

Overall, while there are some indicators of moderate contamination and the presence of certain minerals, the water quality appears to be relatively satisfactory for general purposes. However, ongoing monitoring and potentially targeted interventions may be necessary to address bacterial contamination and ensure long-term water quality sustainability.

Table 4. 6 Observed Results of Surface Water Quality

No.	Parameters	Results	Units
1.	pH	8.6	S.U
2.	Total Suspended Solid	29	mg/L
3.	BOD	25	mg/L
4.	COD	38	mg/L
5.	Total Phosphorus	0.27	mg/L

6.	Total Nitrogen	< 0.5	mg/L
7.	Oil and Grease	6	mg/L
8.	Total Colifom Count	210	MPN/100 ml

- **pH** – The pH level indicates the acidity or alkalinity of the water. A pH of 8.6 is considered moderately alkaline. While it's slightly on the higher side, it falls within the acceptable range for many aquatic organisms.
- **Total Suspended Solids** – Total Suspended Solids (TSS) represent the number of solid particles suspended in the water column. A TSS level of 29 mg/L suggests moderate levels of suspended solids. High TSS levels can indicate poor water quality and can impair aquatic life and aesthetics.
- **BOD** – Biochemical Oxygen Demand (BOD) is a measure of the amount of dissolved oxygen required by aerobic biological organisms to break down organic material present in the water. A BOD level of 25 mg/L indicates moderate organic pollution. Elevated BOD levels can deplete oxygen levels in water bodies, leading to aquatic ecosystem stress and potential fish kills.
- **COD** – Chemical Oxygen Demand (COD) measures the amount of oxygen required to oxidize organic and inorganic matter in the water through chemical processes. A COD level of 38 mg/L indicates moderate organic and inorganic pollution. Like BOD, high COD levels can indicate pollution and can lead to oxygen depletion in water bodies.
- **Total Phosphorus** – Total Phosphorus (TP) is a measure of the total concentration of phosphorus compounds in water. Phosphorus is a nutrient that, in excessive amounts, can contribute to eutrophication, leading to algal blooms and oxygen depletion. A TP level of 0.27 mg/L suggests a relatively low concentration of phosphorus.
- **Total Nitrogen** – Total Phosphorus (TP) is a measure of the total concentration of phosphorus compounds in water. Phosphorus is a nutrient that, in excessive amounts, can contribute to eutrophication, leading to algal blooms and oxygen depletion. A TP level of 0.27 mg/L suggests a relatively low concentration of phosphorus.
- **Oil and Grease** – Oil and Grease concentration indicates the presence of hydrocarbons in the water, which could be from industrial discharge or runoff. A level of 6 mg/L suggests a moderate presence of oil and grease, which could potentially harm aquatic life and affect water quality.

Overall, while some parameters indicate moderate pollution and contamination, others such as nitrogen and phosphorus are within acceptable limits. The presence of oil and grease suggests potential anthropogenic inputs that may require mitigation measures to protect the

aquatic ecosystem and ensure water quality. Further monitoring and management efforts may be needed to maintain or improve the overall health of the water body.

Note: Currently, there is no official announcement regarding Surface Water Quality in Myanmar. Therefore, surface water quality data is solely collected as baseline information. Due to variations in hydrology among neighboring countries, direct comparisons are not feasible. As a result, the water quality data obtained prior to the project's wastewater discharge will serve as baseline data. By evaluating the wastewater discharge results against the initial lake water quality data, any notable alterations can be attributed to the project or other influencing factors.

ALARM Ecological Laboratory

Water Testing Result Report

Report Number : EL-WR-22-00658 Date : September 13, 2022

Client Information

Client Name : U Soe Myint
Organization : -
Client ID : -
Registration Date & Time : 8.9.2022 ; 11:30 AM
Contact : 09-401600255
Testing Purpose : For Standard

Sample Information

Sample ID : 8478
Sample Name : Ground Water
Sample Type / Source : Raw
Sampling Date & Time : 7.9.2022 ; 10:30 AM
Sample Location : Taung Ta Mann Inn Near
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[1]	7.7	S.U	6.5 - 8.5[c]	Normal
2	Temperature[2]	21	°C	-	-
3	TDS[4]	337	mg/L	≤1000 [c]	Normal
4	Conductivity[5]	0.6	mS/cm	≤2.5 [a]	Normal
5	Hardness[3]	112	mg/L	≤500 [c]	Normal
6	Chloride[2]	640	mg/L	≤250 [c]	Above the limit
7	Nitrate[3]	0.6	mg/L	≤10 [b]	Normal
8	Aluminium[3]	< 0.01	mg/L	≤0.2 [a]	Normal
9	Cadmium[7]	ND	mg/L	≤0.003[b]	LOD = 0.01 mg/L
10	Copper[7]	ND	mg/L	≤2[b]	LOD = 0.02 mg/L
11	Iron[3]	0.4	mg/L	≤1[c]	Normal
12	Lead[7]	ND	mg/L	≤0.01 [c]	LOD = 0.1 mg/L
13	Manganese[3]	0.4	mg/L	≤0.4 [c]	Normal
14	Potassium[3]	36	mg/L	-	-
15	Zinc[3]	< 0.02	mg/L	≤3 [c]	Normal
16	Total Alkalinity[3]	740	mg/L	-	-
17	Sulfate[3]	383	mg/L	≤ 250 [c]	Above the limit
18	Calcium[2]	36	mg/L	≤200 [c]	Normal
19	Magnesium[2]	16	mg/L	≤150 [c]	Normal

"ND" = Not Detected "LOD" = Lower limit of detection "-" = No Reference Standard

Tested by	Checked by	Approved by
Daw May Myat Thine Lab. Technician II Ecological Laboratory ALARM	Daw Lin Myat Myat Aung Lab. Technician I Ecological Laboratory ALARM	Dr. Aye Aye Win Laboratory In-Charge Ecological Laboratory (ALARM)

No.237,Corner of Shu Khin Thar Street & 7 Street, (3) Block, South Oakkalapa Township,Yangon.
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ပတ်ဝန်းကျင်ရေးရာဓာတ်ခွဲခန်း
Ecological Laboratory

စိမ်းလန်းအသိုင်းပြေဖွံ့ဖြိုးတိုးတက်ရေးအသင်း (Advancing Life and Regenerating Motherland, ALARM)
531-D, Marlar Myaing Yeik Thar Street, 8 Ward, Kamayut Township, Yangon. Telephone: +95 1 503301

စာအမှတ်/Reference Number: EL (M)-R / 756

ရက်စွဲ/Date: 12th September, 2022

ဓာတ်ခွဲစစ်ဆေးမှုအစီရင်ခံစာ/Laboratory Analysis Report

နမူနာရုပ်ဝင် /Sample Profile

နမူနာအမည် /Sample Name	Surface Water	နမူနာအမှတ် / Sample ID	756	
နေရာ (မြို့နယ်) Location (Township)	တောင်သမန်အင်းအနီး	လတ္တီတွဒ် Latitude		
နေရာ (တိုင်း/ပြည်နယ်) Location (Region/State)	Mandalay	လောင်ဂျီတွဒ် Longitude		
ပေးပို့သူအမည် /Sender Name	U Soe Myint	နမူနာကောက်ယူချိန် (ရက်, နာရီ) Sampling Time (Date, Time)	7.9.2022	11:00 AM
အဖွဲ့အစည်း /Organisation	-			
ဆက်သွယ်ရန် /Contact	09-401600255	နမူနာရောက်ရှိချိန် (ရက်, နာရီ) Arriving Time (Date, Time)	8.9.2022	11:30 AM

(This laboratory analysis report is based solely on the sample submitted by the customer)

(ဤဓာတ်ခွဲစစ်ဆေးမှုအစီရင်ခံစာသည် ပေးပို့သူမှပို့ဆောင်ခဲ့သည့်နမူနာကိုသာအခြေခံထားပါသည်)

Analysis Results/စမ်းသပ်ချက်အခြေ

စဉ် Sr.	အရည်အသွေးညွှန်းကိန်း Quality Parameter	ရလဒ် အခြေ Results	နည်းစဉ် Method	စံသတ်မှတ်ချက် Drinking Standard	မှတ်ချက် Remarks
1	Total plate count (CFU/ml)		Total plate count method	0	
2	Total coliform count (MPN/100 ml) (Presumption test)	210	Most Probable Number method	0	
3	Total faecal coliform count (MPN/100ml) (Presumption test)		Most Probable Number method	0	
4	Total coliform count (CFU/ml) (Confirm test)		Eosin Methyl blue agar plate test	0	
5	Complete test for coliform bacteria		Gram staining test	-	
6	Total coliform count (CFU/ml)		3M Pate count method	0	
7	Total *E.coli* count (CFU/ml)		3M Pate count method	0	

Note: The target sample needs to test some additional tests to confirm total coliform and total faecal coliform.

စမ်းသပ်ပြီး Tested by	စစ်ဆေးပြီး Checked by	တာဝန်ခံ Approved by
May Zaw	May Myat Nyein	Ni Tar Nwe
Research Assistant	Research Assistant	Research Scientist
ALARM	ALARM	ALARM

ALARM Ecological Laboratory

Water Testing Result Report

Report Number : EL-WR-22-00657 Date : September 13, 2022

Client Information

Client Name	:	U Soe Myint		
Organization	:	-		
Client ID	:	-		
Registration Date & Time	:	8.9.2022	;	11:30 AM
Contact	:	09-401600255		
Testing Purpose	:	For Standard		

Sample Information

Sample ID	:	8477		
Sample Name	:	Surface Water		
Sample Type / Source	:	Raw		
Sampling Date & Time	:	7.9.2022	;	11:00 AM
Sample Location	:	Taung Ta Mann Inn Near		
Latitude	:	-		
Longitude	:	-		

Testing Results

This laboratory analysis report is based solely on the sample submitted by the client unless client took our sampling service.
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Sr.	Quality Parameters	Results	Units	Emission Standards	Remarks
1	pH[1]	8.6	S.U	6.0 - 9.0[d]	Normal
2	TSS[1]	29	mg/L	≤50[d]	Normal
3	BOD_5[1]	25	mg/L	≤ 50[c]	Normal
4	COD[1]	38	mg/L	≤ 250[d]	Normal
5	Total Phosphorous[1]	0.27	mg/L	≤2[c]	Normal
6	Total Nitrogen[1]	< 0.5	mg/L	-	-
7	Oil & Grease [1]	6	mg/L	≤ 10[c]	Normal

"ND" = Not Detected "LOD" = Lower Limit of detection "-" = No Reference Standard

Tested by	Checked by	Approved by
Daw Mar[illegible]t Khine Lab. Technician II Ecological Laboratory ALARM	Daw Lin Myat Myat Aung Lab. Technician I Ecological Laboratory ALARM	Dr. Aye Aye Win Laboratory In-Charge Ecological Laboratory (ALARM)

No.237,Corner of Shu Khin Thar Street & 7 Street, (3) Block, South Oakkalapa Township,Yangon.
Tel: 09-407496078, Email: aclab.2022@gmail.com

4.3 Ambient Air Quality

4.3.1 *Ambient Air Quality Survey Point*

The parameters for air quality survey were SO_2, NO_2, CO, $PM_{2.5}$, PM_{10}, Wind Speed and Wind Direction. Three survey points for ambient air quality measuring are located the front of the Taung Thaman Resort Project office, near the construction area and the boundary of near the Tae Nan Village and project area of Taung Thaman Resort. The detail locations of air quality survey points are presented in figure and table below.

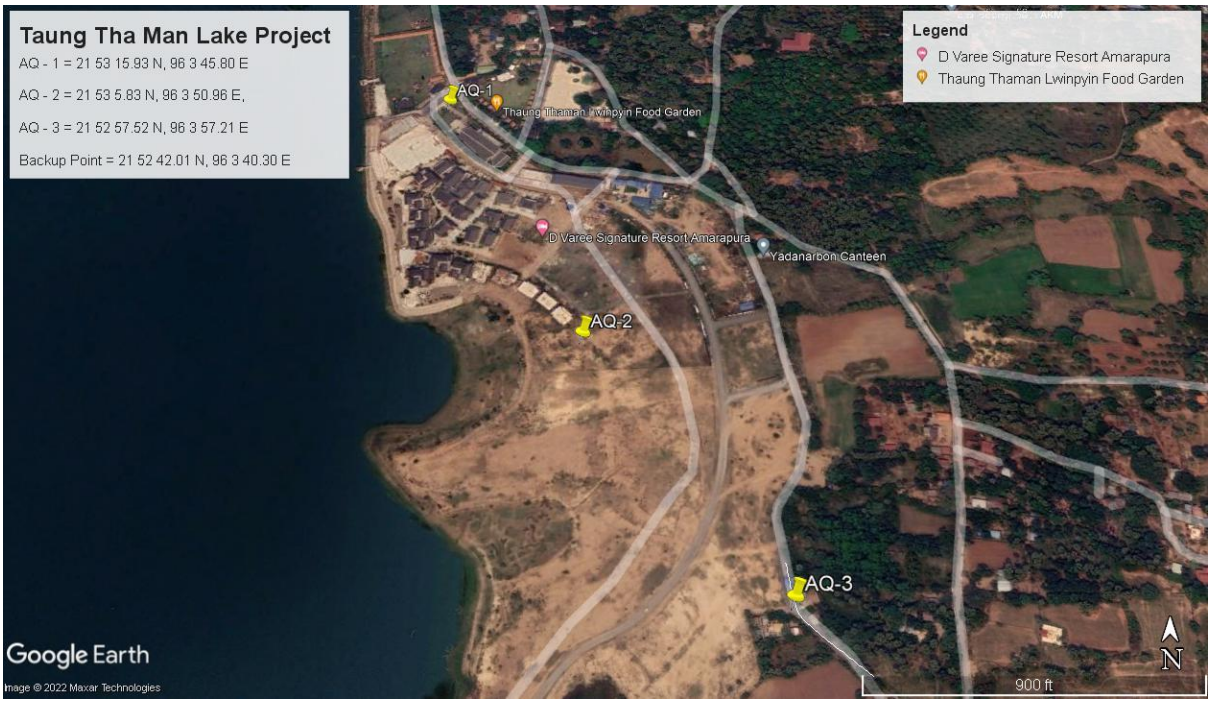

Figure 4. 8 Air Quality Measurement Ponits

Table 4. 7 Location, Date and Time for Air Quality Measurement Points

No	Measuring Points	Coordinate Points	Location	Date
1.	Air Quality Measuring – 1, AQM -1	21° 53’ 15.93” N 96° 03’ 45.08” E	Proximity to Project office	September, 19, 2022 6:30 PM
2.	Air Quality Measuring – 2, AQM -2	21° 53’ 5.83” N 96° 03’ 50.36” E	Near Construction Area	September, 20, 2022 7:00 PM
3.	Air Quality Measuring – 3, AQM -3	21° 52’ 57.52” N 96° 03’ 57.21” E	The boundary of Tan Nae Village and Project site	September, 19, 2022 7:30 PM

4.3.2 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. Different analysis methods are integrated in the instrument, such as Particulates 90° Infrared Light Scattering for particulate matters (PM_{10}, $PM_{2.5}$) and electrochemical sensors for toxic gases (SO_2, NO_2, CO).

4.3.3 Ambient Air Qautlity Survey Point Selection

The selection of survey points for measuring ambient air quality at the Taung Thaman Resort Project was carefully deliberated based on several key considerations:

Proximity to Project Office The survey point located in front of the Taung Thaman Resort Project office was chosen to monitor air quality in close proximity to the project's administrative hub. This allows for the assessment of potential air quality impacts resulting from office activities, including vehicle emissions and operational processes.

Near Constuctuion Area: Placing a survey point near the construction area enables the monitoring of air quality dynamics directly influenced by ongoing construction activities. Construction processes such as excavation, demolition, and material handling can release particulate matter and airborne pollutants, making this location critical for assessing construction-related air quality impacts.

Boundary of Tae Nan Village and Project Area :Selecting a survey point at the boundary of the Tae Nan Village and the project area serves multiple purposes. It facilitates the evaluation of air quality near residential areas, ensuring the protection of community health and well-being. Additionally, it allows for the assessment of potential air quality impacts emanating from the project site on neighboring communities.

By strategically placing survey points at these locations, the Taung Thaman Resort Project aims to comprehensively monitor ambient air quality across different zones within and around the project area. This approach facilitates the identification of potential sources of air pollution, the evaluation of pollutant dispersion patterns, and the formulation of targeted mitigation strategies to safeguard air quality and mitigate adverse impacts on human health and the environment.

4.3.4 Identification of Air Pollutants and Its Impacts (Generally)

The proposed Project site is in the construction stage during the measurement of air quality and the air station is set on to collect data of the current air quality impacted by moving vehicles along the road and the construction works. Therefore, the site has to measure the surrounding air quality to know whether SO_2, NO_2, CO, $PM_{2.5}$ and PM_{10} are exceeding the limiting amounts of Guidelines 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.

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.

4.3.5 Measurement of Air Quality Comparing with NEQEG Guidelines

CO, NO2, SO2, Ozone, PM10 and PM2.5 are measured at the Project site. The site was in the construction stage (pile installation stage) when the air quality survey took place. The standards for applicable to the possible air pollutants were determined from National Environmental Quality (Emissions) Guideline, WHO Global air quality guideline (AQG) and the American Conference of Governmental Industrial Hygienists. The average concentrations of pollutants at selected sampling point for about 24 hours and the observed results are shown in the table below. The measurement results, recorded minute by minute, are detailed in the appendix IV.

Table 4. 8 Observed Values of Air Quality Measurement at Point- 1

Sr	Parameter	Averaging Period	Observes Value	Guideline Value	Guidelines
1	Nitrogen dioxide	1-year 1-hour	- 9.21	40 (µg/m^3) 200 (µg/m^3)	NEQEG
2	Ozone	8-hour daily Maximum	7.93	100 (µg/m^3)	NEQEG
3	PM_{10}	1-year 24-hour	- 12.38	20 (µg/m^3) 50 (µg/m^3)	NEQEG

4	$PM_{2.5}$	1-year 24-hour	- 6.79	10 (µg/m^3) 25 (µg/m^3)	NEQEG
5	Sulfur dioxide	24-hour 10-minute	- 65.57	20 (µg/m^3) 500 (µg/m^3)	NEQEG
6.	Carbon Monoxide	24 hours	0.043	4 mg/m^3	WHO
7.	Temperature	24 hours	26.67	℃	
8.	Wind Speed	24 hours	2.90	Kph	
9.	Wind Direction	24 hours	129.52	Deg	
9.	Relative humidity	24 hours	68.31	RH%	

The observed Nitrogen Dioxide level for the 1-hour averaging period at Point-1 is significantly below the recommended NEQEG guideline of 200 µg/m³, indicating a good air quality level. The Ozone level for the 8-hour daily maximum at Point-1 is well below the NEQEG guideline, suggesting a satisfactory air quality condition. The PM10 level for the 24-hour averaging period at Point-1 is below the NEQEG guideline, indicating a favorable air quality status. The PM2.5 level for the 24-hour averaging period at Point-1 is below the NEQEG guideline, indicating a satisfactory air quality level. The Sulfur Dioxide level for the 10-minute averaging period at Point-1 is below the NEQEG guideline, suggesting a good air quality condition for short-term exposure. The Carbon Monoxide level for the 24-hour averaging period at Point-1 is well below the WHO guideline, indicating a satisfactory air quality condition.

Over the past 24 hours, the region has experienced a moderate climate, characterized by an average temperature of 26.67 degrees Celsius. A gentle breeze has been present, with an average wind speed of 2.9 kilometers per hour. The predominant wind direction from the southeast at 129.52 degrees suggests a consistent flow. Additionally, the relative humidity during this period is recorded at 68.31%, indicating a moderate level of moisture in the air. Overall, these weather conditions paint a picture of a comfortably warm day with a light breeze and a balanced level of humidity.

Table 4. 9 Observed Values of Air Quality Measurement at Point- 2

Sr	Parameter	Averaging Period	Observes Value	Guideline Value	Guidelines
1	Nitrogen dioxide	1-year 1-hour	- 7.43	40 (µg/m^3) 200 (µg/m^3)	NEQEG
2	Ozone	8-hour daily Maximum	6.89	100 (µg/m^3)	NEQEG
3	PM_{10}	1-year 24-hour	- 11.48	20 (µg/m^3) 50 (µg/m^3)	NEQEG
4	$PM_{2.5}$	1-year 24-hour	- 8.94	10 (µg/m^3) 25 (µg/m^3)	NEQEG
5	Sulfur dioxide	24-hour 10-minute	- 63.76	20 (µg/m^3) 500 (µg/m^3)	NEQEG
6.	Carbon Monoxide	24 hours	0.009	4 mg/m^3	WHO
7.	Temperature	24 hours	28.59	℃	
8.	Wind Speed	24 hours	3.70	Kph	
9.	Wind Direction	24 hours	202.74	Deg	
10.	Relative humidity	24 hours	66.00	RH%	

The observed Nitrogen Dioxide level for the 1-hour averaging period at Point-2 is significantly below the recommended NEQEG guideline of 200 µg/m³, indicating a good air quality level. The Ozone level for the 8-hour daily maximum at Point-2 is below the NEQEG guideline, suggesting a satisfactory air quality condition. The PM10 level for the 24-hour averaging period at Point-2 is below the NEQEG guideline, indicating a favorable air quality status. he PM2.5 level for the 24-hour averaging period at Point-2 is below the NEQEG guideline, indicating a satisfactory air quality level. The Sulfur Dioxide level for the 10-minute averaging period at Point-2 is below the NEQEG guideline, suggesting a good air quality condition for short-term exposure. The Carbon Monoxide level for the 24-hour averaging period at Point-2 is well below the WHO guideline, indicating a satisfactory air quality condition.

Over the course of the last 24 hours, the average temperature has been recorded at 28.59 degrees Celsius, indicating a relatively warm climate. The wind conditions reveal a gentle breeze, with an average speed of 3.70 kilometers per hour. The wind direction, predominantly from the south-southwest at 202.74 degrees, suggests a consistent pattern. Additionally, the relative humidity stands at 66.00%, indicating a moderate level of moisture in the air. Overall, these weather observations paint a picture of a warm day with mild winds and moderate humidity levels.

Table 4. 10 Observed Values of Air Quality Measurement at Point- 3

Sr	Parameter	Averaging Period	Observes Value	Guideline Value	Guidelines
1	Nitrogen dioxide	1-year 1-hour	- 9.76	40 (µg/m^3) 200 (µg/m^3)	NEQEG
2	Ozone	8-hour daily Maximum	9.79	100 (µg/m^3)	NEQEG
3	PM_{10}	1-year 24-hour	- 11.80	20 (µg/m^3) 50 (µg/m^3)	NEQEG
4	$PM_{2.5}$	1-year 24-hour	- 5.52	10 (µg/m^3) 25 (µg/m^3)	NEQEG
5	Sulfur dioxide	24-hour 10-minute	- 72.63	20 (µg/m^3) 500 (µg/m^3)	NEQEG
6.	Carbon Monoxide	24 hours	0.025	4 mg/m^3	WHO
7.	Temperature	24 hours	28.08	℃	
8.	Wind Speed	24 hours	4.23	Kph	
9.	Wind Direction	24 hours	203.03	Deg	
10.	Relative humidity	24 hours	67.16	RH%	

The observed Nitrogen Dioxide level for the 1-hour averaging period at Point-3 is significantly below the recommended NEQEG guideline of 200 µg/m³, indicating a good air quality level. he Ozone level for the 8-hour daily maximum at Point-3 is well below the NEQEG guideline, suggesting a satisfactory air quality condition. The PM10 level for the 24-hour averaging period at Point-3 is below the NEQEG guideline, indicating a favorable air

quality status. The PM2.5 level for the 24-hour averaging period at Point-3 is below the NEQEG guideline, indicating a satisfactory air quality level. The Sulfur Dioxide level for the 10-minute averaging period at Point-3 is below the NEQEG guideline, suggesting a good air quality condition for short-term exposure. The Carbon Monoxide level for the 24-hour averaging period at Point-3 is well below the WHO guideline, indicating a satisfactory air quality condition.

Over the span of the last 24 hours, the region has experienced a relatively warm climate, with an average temperature of 28.08 degrees Celsius. A gentle breeze has been observed, with an average wind speed of 4.23 kilometers per hour. The predominant wind direction, coming from the south-southwest at 203.03 degrees, indicates a consistent airflow. Furthermore, the relative humidity during this period has been recorded at 67.16%, suggesting a moderate level of moisture in the air. Overall, these weather conditions paint a picture of a warm and moderately humid day, accompanied by a mild breeze.

Figure 4. 9 Photo records or Air Quality, Noise and Vibration Measurement Points

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စိမ်းလန်းအမိမြေနှင့်ပြုံးတိုးတက်ရေးအသင်း (Advancing Life and Regenerating Motherland, ALARM)

Reference Number/ စာအမှတ်: EL-R /418

Date / နေ့စွဲ: 11 October, 2022

Air Analysis Report (လေထုအရည်အသွေး စစ်ဆေးမှု အစီရင်ခံစာ)

Air Analysis Info / လေထုတိုင်းတာမှု အချက်အလက်

လေထုတိုင်းတာသည့်နေရာ Sample site:	Taung Tha Man Resort စီမံအုပ်ချုပ်မှုရုံးရှေ့	လေနမူနာအမှတ်စဉ်Sample I.D.	422	
နေရာ (မြို့နယ်) Location (township)	အမရပူရမြို့နယ်	လတ္တီတွဒ် Latitude	21°53'15.93"N	
		လောင်ဂျီတွဒ် Longitude	96° 03'45.80"E	
နေရာ (တိုင်းဒေသကြီး/ပြည်နယ်) Location (Region / state)	မန္တလေးတိုင်းဒေသကြီး	နည်းစနစ် Method	Haz-Scanner (EPAS)	
		စက်တည်အမြင့်(မြေပြင်မှ) Station height (above ground)	Ground (Ambient Air Quality Testing)	
တိုင်းတာလိုသူ အမည် Name of customer:	Taung Tha Man Thitsar Resort	စတင်တိုင်းတာသည့်ချိန် (နေ့အချိန်) log on time (Date,Time)	19.9.2022	18:20 PM
တိုင်းတာသည့်နေ့စွဲ Air Sampling Testing Date	19.9.2022	တိုင်းတာပြီးသည့်အချိန်(နေ့အချိန်) log off time (Date,Time)	20.9.2022	18:20 PM
ဆက်သွယ်ရန် လိပ်စာ/ဖုန်း Contact Address/phone	-	တိုင်းတာမှု ကြာချိန် Logging Duration (hours)	24 hours	

Air testing result / လေထုတိုင်းတာစမ်းသပ်ချက်အဖြေ

စဉ် No.	အရည်အသွေး Parameter	ရလဒ် Results	ယူနစ် Unit	ပျမ်းမျှကာလ Avg. Period		ထုတ်လွှတ်မှုစံနှုန်း Guideline Value	ပျမ်းမျှကာလ Avg. Period
၁	နိုက်ထရိုဂျင်ဒိုင်အောက်ဆိုဒ် Nitrogen dioxide	9.21	μg/m³ μg/m³	1	year hour	*40 μg/m³ * 200 μg/m³	1-year 1-hour
၂	Particulate matter PM 10	12.38	μg/m³ μg/m³	24	year hours	*20 μg/m³ * 50 μg/m³	1-year 24-hour
၃	Particulate matter PM 2.5	6.79	μg/m³ μg/m³	24	year hours	* 10 μg/m³ * 25 μg/m³	1-year 24 hour
၄	ဆာလဖာဒိုင်အောက်ဆိုဒ် Sulfur Dioxide	65.57	μg/m³ μg/m³	10	hours min	* 20 μg/m³ * 500 μg/m³	24-hour 10 minute
၅	အိုဇုန်း Ozone	7.93	μg/m³ μg/m³	8	year hours	* 100 μg/m³	8 Hour Daily Maximum
၆	ကာဗွန်မိုနောက်ဆိုဒ် Carbon monoxide	0.0433	ppm ppm	24	year hours	NG	-

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(ဓါတ်ခွဲခန်း၏ စာဖြင့်ရေးသားထောက်ခံချက်မရှိဘဲ ဤအစီရင်ခံစာကို အပြည့်အစုံမှလွဲ၍ တစ်စိတ်တစ်ပိုင်း ဖြတ်ယူဖော်ပြခြင်း မိတ္တူကူးခြင်းမပြုလုပ်ရ)

No-237, Conner of Shuu Khin Thar Thar Street & (7) Street, (3) Block, South Okkalapa Township, Yangon.
Telephone: +95 973076412
Email: info@alarmmyanmar.org, alarm.myanmar@gmail.com , Website: www.alarmmyanmar.org

ပတ်ဝန်းကျင်ရေးရာဓာတ်ခွဲခန်း
Ecological Laboratory

စိမ်းလန်းအမိမြေဖွံ့ဖြိုးတိုးတက်ရေးအသင်း (Advancing Life and Regenerating Motherland, ALARM)

စဉ် No.	အရည်အသွေး Parameter	ရလဒ် Results	ယူနစ် Unit	ပျမ်းမျှကာလ Avg. Period		ထုတ်လွှတ်မှုစံနှုန်း Guideline Value	ပျမ်းမျှကာလ Avg. Period
၇	အပူချိန် Temperature		°C		hour		
		26.67	°C	24	hours	NG	-
၈	လေတိုက်နှုန်း Wind Speed		Kph		hour		
		2.90	Kph	24	hours	NG	-
၉	လေတိုက်ရာအရပ် Wind Direction		Deg		hour		
		129.52	Deg	24	hours	NG	-
၁၀	စိုထိုင်းဆ Relative Humidity		RH%		hour		
		68.31	RH%	24	hours	NG	-

* Myanmar Environmental Quality Emission Guideline 2015 NG= No Guideline

မှတ်ချက်။ တိုင်းတာသည့်ကြာချိန်သည် သတ်မှတ်စံနှုန်းအချိန်ထက်နည်းပါက အများဆုံးတိုင်းတာခဲ့သည့်အချိန်၏ ပျမ်းမျှရလဒ်ကိုသာဖော်ပြထားပါသည်။ သတ်မှတ်စံနှုန်းအချိန်ထက် ပိုမိုတိုင်းတာထားသောအရည်အသွေးများအတွက် သတ်မှတ်အချိန် ပျမ်းမျှရလဒ်များ၏ အများဆုံးရလဒ်တစ်ခုသာဖော်ပြထားပါသည်။

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Reference Number/ စာအမှတ်: EL-R /419

Date / နေ့စွဲ: 11 October, 2022

Air Analysis Report (လေတိုင်းတာ စစ်ဆေးမှု အစီအရင်ခံစာ)

Air Analysis Info / လေတိုင်းတာမှု အချက်အလက်

လေတိုင်းသည့်နေရာ Sample site:	စီမံကိန်းလုပ်ငန်းခွင်၏ ဆောက်လုပ်ရေးလုပ်ငန်းခွင်အနီး	လေနမူနာအမှတ်စဉ်Sample I.D.	423	
နေရာ (မြို့နယ်) Location (township)	အမရပူရမြို့နယ်	လတ်တီတွဒ် Latitude	21°53'05.83"N	
		လောင်ဂျီတွဒ် Longitude	96° 03'50.96"E	
နေရာ (တိုင်းပြည်နယ်) Location (Region / state)	မန္တလေးတိုင်းဒေသကြီး	နည်းစဉ် Method	Haz-Scanner (EPAS)	
		စက်တည်အမြင့်(မြေပြင်မှ) Station height (above ground)	Ground (Ambient Air Quality Testing)	
တိုင်းတာလိုသူ အမည် Name of customer:	Taung Tha Man Thitsar Resort	စတင်တိုင်းတာသည့်ချိန် (နေ့အချိန်) log on time (Date,Time)	20.9.2022	19:01 PM
တိုင်းတာသည့်နေ့စွဲ Air Sampling Testing Date	20.9.2022	တိုင်းတာပြီးသည့်အချိန်(နေ့အချိန်) log off time (Date,Time)	21.9.2022	19:01 PM
ဆက်သွယ်ရန် လိပ်စာ/ဖုန်း Contact Address/phone	-	တိုင်းတာမှု ကြာချိန် Logging Duration (hours)	24 hours	

Air testing result / လေထုတိုင်းတာစမ်းသပ်ချက်အဖြေ

စဉ် No.	အရည်အသွေး Parameter	ရလဒ် Results	ယူနစ် Unit	ပျမ်းမျှကာလ Avg. Period		ထုတ်လွှတ်မှုစံနှုန်း Guideline Value	ပျမ်းမျှကာလ Avg. Period
၁	နိုက်ထရိုဂျင်ဒိုင်အောက်ဆိုဒ် Nitrogen dioxide	7.43	µg/m³ µg/m³	1	year hour	*40 µg/m³ * 200 µg/m³	1-year 1-hour
၂	Particulate matter PM_{10}	11.48	µg/m³ µg/m³	24	year hours	*20 µg/m³ * 50 µg/m³	1-year 24-hour
၃	Particulate matter $PM_{2.5}$	8.94	µg/m³ µg/m³	24	year hours	* 10 µg/m³ * 25 µg/m³	1-year 24 hour
၄	ဆာလဖာဒိုင်အောက်ဆိုဒ် Sulfur Dioxide	63.76	µg/m³ µg/m³	10	hours min	* 20 µg/m³ * 500 µg/m³	24-hour 10 minute
၅	အိုဇုန်း Ozone	6.89	µg/m³ µg/m³	8	year hours	* 100 µg/m³	8 Hour Daily Maximum
၆	ကာဗွန်မိုနောက်ဆိုဒ် Carbon monoxide	0.0082	ppm ppm	24	year hours	NG	-

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စဉ် No.	အရည်အသွေး Parameter	ရလဒ် Results	ယူနစ် Unit	ပျမ်းမျှကာလ Avg. Period		ထုတ်လွှတ်မှုစံနှုန်း Guideline Value	ပျမ်းမျှကာလ Avg. Period
၇	အပူချိန် Temperature		°C		hour		
		28.59	°C	24	hours	NG	-
၈	လေတိုက်နှုန်း Wind Speed		Kph		hour		
		3.70	Kph	24	hours	NG	-
၉	လေတိုက်ရာအရပ် Wind Direction		Deg		hour		
		202.74	Deg	24	hours	NG	-
၁၀	စိုထိုင်းဆ Relative Humidity		RH%		hour		
		66.00	RH%	24	hours	NG	-

* Myanmar Environmental Quality Emission Guideline 2015 NG= No Guideline

မှတ်ချက်။ ။တိုင်းတာသည့်ကြာချိန်သည် သတ်မှတ်စံနှုန်းအချိန်ထက်နည်းပါက အများဆုံးတိုင်းတာခဲ့သည့်အချိန်၏ ပျမ်းမျှရလဒ်ကိုသာဖော်ပြထားပါသည်။ သတ်မှတ်စံနှုန်းအချိန်ထက် ပိုမိုတိုင်းတာထားသောအရည်အသွေးများအတွက် သတ်မှတ်အချိန် ပျမ်းမျှရလဒ်များ၏ အများဆုံးရလဒ်တစ်ခုသာဖော်ပြထားပါသည်။

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Reference Number/ စာအမှတ်: EL-R /420

Date / နေ့စွဲ: 11 October, 2022

Air Analysis Report (လေထုတိုင်းတာ စစ်ဆေးမှု အစီအရင်ခံစာ)

Air Analysis Info / လေတိုင်းတာမှု အချက်အလက်

လေတိုင်းသည့်နေရာ Sample site:	စီမံကိန်းလုပ်ငန်းခွင်နှင့်အနီးဝန်းကျင်ရှိကျေးရွာများအနီး	လေနမူနာအမှတ်စဉ်Sample I.D.	424	
နေရာ (မြို့နယ်) Location (township)	အမရပူရမြို့နယ်	လတ်တီတွဒ် Latitude	**21°52'57.52"N**	
		လောင်ဂျီတွဒ် Longitude	**96° 03'57.21"E**	
နေရာ (တိုင်းဒေသကြီး/ပြည်နယ်) Location (Region / state)	မန္တ လေးတိုင်းဒေသကြီး	နည်းစဉ် Method	Haz-Scanner (EPAS)	
		စက်တည်အမြင့်(မြေပြင်မှ) Station height (above ground)	Ground (Ambient Air Quality Testing)	
တိုင်းတာလိုသူ အမည် Name of customer:	Taung Tha Man Thitsar Resort	စတင်တိုင်းတာသည့်အချိန် (နေ့အချိန်) log on time (Date,Time)	21.9.2022	19:30 PM
တိုင်းတာသည့်နေ့စွဲ Air Sampling Testing Date	21.9.2022	တိုင်းတာပြီးသည့်အချိန်(နေ့အချိန်) log off time (Date,Time)	22.9.2022	19:30 PM
ဆက်သွယ်ရန် လိပ်စာ/ဖုန်း Contact Address/phone	-	တိုင်းတာမှု ကြာချိန် Logging Duration (hours)	24 hours	

Air testing result / လေထုတိုင်းတာစမ်းသပ်ချက်အဖြေ

စဉ် No.	အရည်အသွေး Parameter	ရလဒ် Results	ယူနစ် Unit	ပျမ်းမျှကာလ Avg. Period		ထုတ်လွှတ်မှုစံနှုန်း Guideline Value	ပျမ်းမျှကာလ Avg. Period
၁	နိုက်ထရိုဂျင်ဒိုင်အောက်ဆိုဒ် Nitrogen dioxide	9.76	μg/m³ μg/m³	1	year hour	*40 μg/m³ * 200 μg/m³	1-year 1-hour
၂	Particulate matter PM 10	11.80	μg/m³ μg/m³	24	year hours	*20 μg/m³ * 50 μg/m³	1-year 24-hour
၃	Particulate matter PM 2.5	5.52	μg/m³ μg/m³	24	year hours	* 10 μg/m³ * 25 μg/m³	1-year 24 hour
၄	ဆာလဖာဒိုင်အောက်ဆိုဒ် Sulfur Dioxide	72.63	μg/m³ μg/m³	10	hours min	* 20 μg/m³ * 500 μg/m³	24-hour 10 minute
၅	အိုဇုန်း Ozone	9.79	μg/m³ μg/m³	8	year hours	* 100 μg/m³	8 Hour Daily Maximum
၆	ကာဗွန်မိုနောက်ဆိုဒ် Carbon monoxide	0.022	ppm ppm	24	year hours	NG	-

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၇	အပူချိန် Temperature		°C		hour		
		28.08	°C	24	hours	NG	-
၈	လေတိုက်နှုန်း Wind Speed		Kph		hour		
		4.23	Kph	24	hours	NG	-
၉	လေတိုက်ရာအရပ် Wind Direction		Deg		hour		
		203.03	Deg	24	hours	NG	-
၁၀	စိုထိုင်းဆ Relative Humidity		RH%		hour		
		67.16	RH%	24	hours	NG	-

* Myanmar Environmental Quality Emission Guideline 2015 NG= No Guideline

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4.4 Noise Study

4.4.1 Purpose of the Noise Study

The purpose of this noise study is to evaluate noise impacts to the workers and near local people and compare with the National Environmental Quality (Emissions) Guideline (2015). If the noise level was the exceed the Guideline, to plan for the mitigation plan.

4.4.2 Selection of the Noise Level Measurement

The locations chosen for noise studies align with those selected for air quality measurements at parapgraph (4.3.3)

4.4.3 Fundamental of Noise

4.4.3.1 Sound Noise, and Acoustics

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium to a hearing organ such as a human ear. Noise is defined as loud, unexpected, or annoying sound.

In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receiver, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receiver determine the sound level and characteristics of the noise perceived by the receiver.

4.4.3.2 Frequency

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low-frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or Hertz (Hz). High frequencies are sometimes more conveniently expressed in kilohertz (kHz), or thousands of Hertz. The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.

4.4.3.3 Sound Pressure Levels and Decibels

The amplitude of pressure waves generated by a sound source determines the loudness of that source. Sound pressure amplitude is measured in micro-Pascal (mPa). One mPa is approximately one hundred billionth (0.00000000001) of normal atmospheric pressure.

Sound pressure amplitudes for different kinds of noise environments can range from less than 100 to 100,000,000 mPa. Because of this huge range of values, sound is rarely expressed in terms of mPa. Instead, a logarithmic scale is used to describe sound pressure level

(SPL) in terms of decibels (dB). The threshold of hearing for young people is about 0 dB, which corresponds to 20 mPa.

4.4.3.4 Addition of Decibels

Because decibels are logarithmic units, SPL cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3-dB increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dB higher than one source under the same conditions. Under the decibel scale, three sources of equal loudness together produce a sound level 5 dB louder than one source.

4.4.3.5 A-Weighted Decibels

Human hearing is limited in the range of audible frequencies as well as in the way it perceives the SPL in that range. In general, people are most sensitive to the frequency range of 1,000–8,000 Hz, and perceive sounds within that range better than sounds of the same amplitude in higher or lower frequencies. To approximate the response of the human ear, sound levels of individual frequency bands are weighted, depending on the human sensitivity to those frequencies. Then, an "A-weighted" sound level (expressed in units of dBA) can be computed based on this information.

The A-weighting network approximates the frequency response of the average young ear when listening to most ordinary sounds. When people make judgments of the relative loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds.

4.4.3.6 Human Response to Changes in Noise Levels

As discussed above, doubling sound energy results in a 3-dB increase in sound. However, given a sound level change measured with precise instrumentation, the subjective human perception of a doubling of loudness will usually be different than what is measured.

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear is able to discern 1-dB changes in sound levels, when exposed to steady, single-frequency signals in the mid-frequency (1,000 Hz–8,000 Hz) range. In typical noisy environments, changes in noise of 1 to 2 dB are generally not perceptible. However, it is widely accepted that people are able to begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5-dB increase is generally perceived as a distinctly noticeable increase, and a 10-dB increase is generally perceived as a doubling of loudness. Therefore, a doubling of sound

energy that would result in a 3-dB increase in sound, would generally be perceived as barely detectable.

4.4.3.7 Noise Descriptors

Noise in our daily environment fluctuates over time. Some fluctuations are minor, but some are substantial. Some noise levels occur in regular patterns, but others are random. Some noise levels fluctuate rapidly, but others slowly. Some noise levels vary widely, but others are relatively constant. Various noise descriptors have been developed to describe time-varying noise levels. The following are the noise descriptors most commonly used in noise analysis.

- **Equivalent Sound Level (L_{Aeq})**: Leq represents an average of the sound energy occurring over a specified period. In effect, Leq is the steady-state sound level containing the same acoustical energy as the time-varying sound that actually occurs during the same period. The 1-hour A-weighted equivalent sound level (Leq[h]) is the energy average of A-weighted sound levels occurring during a one-hour period, and is the basis for noise abatement criteria (NAC).
- **Percentile-Exceeded Sound Level (L_{xx})**: Lxx represents the sound level exceeded for a given percentage of a specified period (e.g., L10is the sound level exceeded 10% of the time, and L90is the sound level exceeded 90% of the time).
- **Maximum Sound Level (L_{max})**: L_{max} is the highest instantaneous sound level measured during a specified period.
- **Day-Night Level (L_{dn})**: Ldn is the energy average of A-weighted sound levels occurring over a 24-hour period, with a 10-dB penalty applied to A-weighted sound levels occurring during nighttime hours between 10 p.m. and 7 a.m.
- **Community Noise Equivalent Level (CNEL)**: Similar to Ldn, CNEL is the energy average of the A-weighted sound levels occurring over a 24-hourperiod, with a 10-dB penalty applied to A-weighted sound levels occurring during the nighttime hours between 10 p.m. and 7 a.m., and a 5-dB penalty applied to the A-weighted sound levels occurring during evening hours between 7 p.m. and 10 p.m.

4.4.3.8 Sound Propagation

(a) Geometric spreading

Sound from a localized source propagates uniformly outward in a spherical pattern. The sound level attenuates at a rate of 6 decibels for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path, and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line

source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 decibels for each doubling of distance from a line source.

(b) Ground absorption

Noise attenuation from ground absorption and reflective-wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually sufficiently accurate for distances of less than 200 feet. For acoustically hard sites, no excess ground attenuation is assumed. For acoustically absorptive or soft sites, an excess ground-attenuation value of 1.5 decibels per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 decibels per doubling of distance.

(c) Atmospheric effects

Receptors located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Other factors such as air temperature, humidity, and turbulence can also have significant effects.

(d) Shielding by natural or human-made features

A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Natural terrain features and human-made features can substantially reduce noise levels. Walls are often constructed between a source and a receiver specifically to reduce noise. A barrier that breaks the line of sight between a source and a receiver will typically result in at least 5 dB of noise reduction. Taller barriers provide increased noise reduction.

4.4.4 Study Methods

4.4.4.1 Measurement Time

The noise under investigation is measured for sufficient time to establish that the measured value adequately represents the subject source noise. The source noise is measured over a time interval of at least 1 minutes or, if the noise continues for less than 1 minutes, the duration of the source noise.

Typical monitoring periods should be sufficient for statistical analysis and may last 48 hours with the use of noise monitors that should be capable of logging data continuously over this time period, or hourly, or more frequently, as appropriate (or else cover differing time

periods within several days, including weekday and weekend workdays). The type of acoustic indices recorded depends on the type of noise being monitored, as established by a noise expert.

4.4.4.2 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.

Table 4. 11 Location, Date and time for Noise Level Measurement

No	Measuring Points	Coordinate Points	Location	Date
1.	Noise Level Measuring – 1, NLM -1	21° 53’ 15.93” N 96° 03’ 45.08” E	Front of Taung Thaman Resort office	September, 19, 2022 6:30 PM
2.	Air Quality Measuring – 2, NLM -2	21° 53’ 5.83” N 96° 03’ 50.36” E	Near Construction	September, 20, 2022 7:00 PM
3.	Noise Level Measuring – 3, NLM -3	21° 52’ 57.52” N 96° 03’ 57.21” E	The boundary of Tan Nae Village and Project site	September, 19, 2022 7:30 PM

2.

3.

Figure 4. 10 Location map of Noise Level Measurement ponits

4.4.4.3 Measurement Method

The Noise level measurement method is used to get noise levels; a tripod is used for a compliance inspection or to take enforcement action for 24 hours. To obtain the most accurate data using this method, the sound level meter is held out at arm's length and held out to the side with the microphone pointed towards the source of the noise, to minimize sound reflecting off the body.

4.4.5 Existing Noise Environment

The project is located at the southeast bank of Taung Thaman Lake and has road traffic related noise sources from village roads connecting nearby villages. The noise environment at the project is dominated by traffic noise and some human activities, construction activities with most activities during daytime hours. The noise monitoring results are summarized in the following table to demonstrate baseline noise levels around the site.

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Noise Analysis Info / အသံတိုင်းတာမှု အချက်အလက်

အသံတိုင်းသည့်နေရာ Sample site:	Taung Tha Man Resort စီမံအုပ်ချုပ်မှုရုံးရှေ့	နမူနာအမှတ်စဉ်Sample I.D	076	
နေရာ (မြို့နယ်) Location (township)	အမရပူရမြို့နယ်	လတ်တီတွဒ် Latitude	N 21˚53′ 15.93″	
		လောင်ဂျီတွဒ် Longitude	E 096˚03′ 45.80″	
နေရာ (တိုင်း/ပြည်နယ်) Location (Region / state)	မန္တလေးတိုင်းဒေသကြီး	နည်းစဉ် Method	BENETECH Digital Sound Level Meter	
တိုင်းတာလိုသူ အမည် Name of customer:	Taung Tha Man Thitsar Resort	စတင်တိုင်းတာသည့်အချိန် (နေ့အချိန်) log on time (Date,Time)	19.9.2022	18:20 PM
တိုင်းတာသည့်နေ့စွဲ Air Sampling Testing Date	19/ 9 / 2022	တိုင်းတာပြီးသည့်အချိန်(နေ့အချိန်) log off time (Date,Time)	20.9.2022	18:20 PM
ဆက်သွယ်ရန် လိပ်စာ/ဖုန်း Contact Address/phone	-	တိုင်းတာမှု ကြာချိန် Logging Duration (hours)	24 hours	

Noise Testing Results /အသံတိုင်းတာစမ်းသပ်ချက်အဖြေ

Testing Time	Testing Results (One Hour Average)	Guideline Value (NEQG)*		
Day -Time	Unit – dBA	One Hour LAeq (dBA)**		
7:00-8:00	**58.96**	Receptor	Day-time 07:00- 22:00 (10:00-22:00 for Public holidays)	Night Time 22:00- 07:00 (22:00-10:00 for Public holidays)
8:00-9:00	**68.33**			
9:00-10:00	**64.14**			
10:00-11:00	**63.61**			
11:00-12:00	**62.09**	Residential, Institutional Educational	55	45
12:00-13:00	**59.01**			
13:00-14:00	**63.69**			
14:00-15:00	**64.34**			
15:00-16:00	**49.68**			
16:00-17:00	**50.11**	Industrial, Commercial	70	70
17:00-18:00	**57.12**			
18:00-19:00	**61.94**			
19:00-20:00	**56.59**			
20:00-21:00	**57.12**			
21:00-22:00	**52.91**			
Day-Time Average (LAeq)	**59.31**			

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(ဓာတ်ခွဲခန်း၏ စာဖြင့်ရေးသားထားသော သဘောတူညီချက်မရှိဘဲ ဤအစီရင်ခံစာကို အပြည့်အစုံမှလွဲ၍ တစ်စိတ်တစ်ပိုင်း ဖြတ်ယူဖော်ပြခြင်း မိတ္တူကူးခြင်းမပြုလုပ်ရ)

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Testing Time	Testing Results (One Hour Average)	Guideline Value (NEQG)*		
Night -Time	**Unit – dBA**	**One Hour LAeq (dBA)****		
22:00-23:00	**48.51**	**Receptor**	**Day-time 07:00- 22:00 (10:00-22:00 for Public holidays)**	**Night Time 22:00- 07:00 (22:00-10:00 for Public holidays)**
23:00-24:00	**47.77**			
00:00-1:00	**47.80**			
1:00-2:00	**49.99**			
2:00-3:00	**50.04**	Residential, Institutional Educational	55	45
3:00-4:00	**47.12**			
4:00-5:00	**47.88**			
5:00-6:00	**47.22**	Industrial, Commercial	70	70
6:00-7:00	**53.59**			
Night-Time Average (LAeq)	**48.88**			

*Myanmar Environmental Quality Emission Guideline 2015

**Equivalent continuous sound level in decibels

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Analyzed by
Kyaw Thu Sein
Mobile Lab Technician
Ecological Laboratory
ALARM

စစ်ဆေးသူ
Checked by
Dr. Aye Aye Win
Laboratory In-Charge
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(ALARM)

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Noise Analysis Info / အသံတိုင်းတာမှု အချက်အလက်

အသံတိုင်းသည့်နေရာ Sample site:	စီမံကိန်းလုပ်ငန်းခွင်၏ ဆောက်လုပ်ရေးလုပ်ငန်းခွင်အနီး	နမူနာအမှတ်စဉ်Sample I.D	077	
နေရာ (မြို့နယ်) Location (township)	အမရပူရမြို့နယ်	လတ်တီတွဒ် Latitude	N 21°53′ 05.83″	
		လောင်ဂျီတွဒ် Longitude	E 096°03′ 50.96″	
နေရာ (တိုင်းဒေသကြီး/ပြည်နယ်) Location (Region / state)	မန္တလေးတိုင်းဒေသကြီး	နည်းစနစ် Method	BENETECH Digital Sound Level Meter	
တိုင်းတာလိုသူ အမည် Name of customer:	Taung Tha Man Thitsar Resort	စတင်တိုင်းတာသည့်အချိန် (နေ့အချိန်) log on time (Date,Time)	20.9.2022	19:01 PM
တိုင်းတာသည့်နေ့စွဲ Air Sampling Testing Date	20/ 9 / 2022	တိုင်းတာပြီးသည့်အချိန်(နေ့အချိန်) log off time (Date,Time)	21.9.2022	19:01 PM
ဆက်သွယ်ရန် လိပ်စာ/ဖုန်း Contact Address/phone	-	တိုင်းတာမှု ကြာချိန် Logging Duration (hours)	24 hours	

Noise Testing Results /အသံတိုင်းတာစမ်းသပ်ချက်အဖြေ

Testing Time	Testing Results (One Hour Average)	Guideline Value (NEQG)*		
Day -Time	Unit – dBA	One Hour LAeq (dBA)**		
7:00-8:00	**58.75**	**Receptor**	**Day-time 07:00- 22:00 (10:00-22:00 for Public holidays)**	**Night Time 22:00- 07:00 (22:00-10:00 for Public holidays)**
8:00-9:00	**58.72**			
9:00-10:00	**63.23**			
10:00-11:00	**66.47**			
11:00-12:00	**64.53**	Residential, Institutional Educational	55	45
12:00-13:00	**64.59**			
13:00-14:00	**56.82**			
14:00-15:00	**50.91**			
15:00-16:00	**47.67**			
16:00-17:00	**53.82**	Industrial, Commercial	70	70
17:00-18:00	**60.51**			
18:00-19:00	**63.22**			
19:00-20:00	**51.63**			
20:00-21:00	**52.72**			
21:00-22:00	**56.97**			
Day-Time Average (LAeq)	**58.04**			

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Testing Time	Testing Results (One Hour Average)	Guideline Value (NEQG)*		
Night -Time	**Unit – dBA**	**One Hour LAeq (dBA)****		
22:00-23:00	**59.92**	**Receptor**	**Day-time 07:00- 22:00 (10:00-22:00 for Public holidays)**	**Night Time 22:00- 07:00 (22:00-10:00 for Public holidays)**
23:00-24:00	**59.43**			
00:00-1:00	**52.55**			
1:00-2:00	**52.18**			
2:00-3:00	**50.75**	Residential, Institutional Educational	55	45
3:00-4:00	**59.43**			
4:00-5:00	**56.25**			
5:00-6:00	**56.64**	Industrial, Commercial	70	70
6:00-7:00	**57.49**			
Night-Time Average (LAeq)	**56.07**			

*Myanmar Environmental Quality Emission Guideline 2015

**Equivalent continuous sound level in decibels

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Noise Analysis Info / အသံတိုင်းတာမှု အချက်အလက်

အသံတိုင်းသည့်နေရာ Sample site:	စီမံကိန်းလုပ်ငန်းခွင်နှင့်အနီးဝန်းကျင်ရှိကျေးရွာများအနီး	နမူနာအမှတ်စဉ်Sample I.D	078	
နေရာ (မြို့နယ်) Location (township)	အမရပူရမြို့နယ်	လတ္တီတွဒ် Latitude	N 21˚52′ 57.52″	
		လောင်ဂျီတွဒ် Longitude	E 096˚03′ 57.21″	
နေရာ (တိုင်းဒေသကြီး/ပြည်နယ်) Location (Region / state)	မန္တလေးတိုင်းဒေသကြီး	နည်းစဉ် Method	BENETECH Digital Sound Level Meter	
တိုင်းတာလိုသူ အမည် Name of customer:	Taung Tha Man Thitsar Resort	စတင်တိုင်းတာသည့်အချိန် (နေ့အချိန်) log on time (Date,Time)	21.9.2022	19:30 PM
တိုင်းတာသည့်နေ့စွဲ Air Sampling Testing Date	21/ 9 / 2022	တိုင်းတာပြီးသည့်အချိန်(နေ့အချိန်) log off time (Date,Time)	22.9.2022	19:30 PM
ဆက်သွယ်ရန် လိပ်စာ/ဖုန်း Contact Address/phone	-	တိုင်းတာမှု ကြာချိန် Logging Duration (hours)	24 hours	

Noise Testing Results /အသံတိုင်းတာစမ်းသပ်ချက်အဖြေ

Testing Time	Testing Results (One Hour Average)	Guideline Value (NEQG)*		
Day -Time	Unit – dBA	One Hour LAeq (dBA)**		
7:00-8:00	58.95	Receptor	Day-time 07:00- 22:00 (10:00-22:00 for Public holidays)	Night Time 22:00- 07:00 (22:00-10:00 for Public holidays)
8:00-9:00	51.44			
9:00-10:00	47.87			
10:00-11:00	56.17			
11:00-12:00	60.67	Residential, Institutional Educational	55	45
12:00-13:00	62.25			
13:00-14:00	51.44			
14:00-15:00	55.53			
15:00-16:00	53.31			
16:00-17:00	52.38	Industrial, Commercial	70	70
17:00-18:00	47.96			
18:00-19:00	47.01			
19:00-20:00	48.63			
20:00-21:00	49.67			
21:00-22:00	49.38			
Day-Time Average (LAeq)	52.84			

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Testing Time	Testing Results (One Hour Average)	Guideline Value (NEQG)*		
Night -Time	**Unit – dBA**	**One Hour LAeq (dBA)****		
22:00-23:00	**47.40**	**Receptor**	**Day-time 07:00- 22:00 (10:00-22:00 for Public holidays)**	**Night Time 22:00- 07:00 (22:00-10:00 for Public holidays)**
23:00-24:00	**47.05**			
00:00-1:00	**47.37**			
1:00-2:00	**46.04**			
2:00-3:00	**48.67**	Residential, Institutional Educational	55	45
3:00-4:00	**50.29**			
4:00-5:00	**51.71**			
5:00-6:00	**54.28**	Industrial, Commercial	70	70
6:00-7:00	**55.65**			
Night-Time Average (LAeq)	**49.83**			

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**Equivalent continuous sound level in decibels

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Analyzed by
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ALARM

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Checked by
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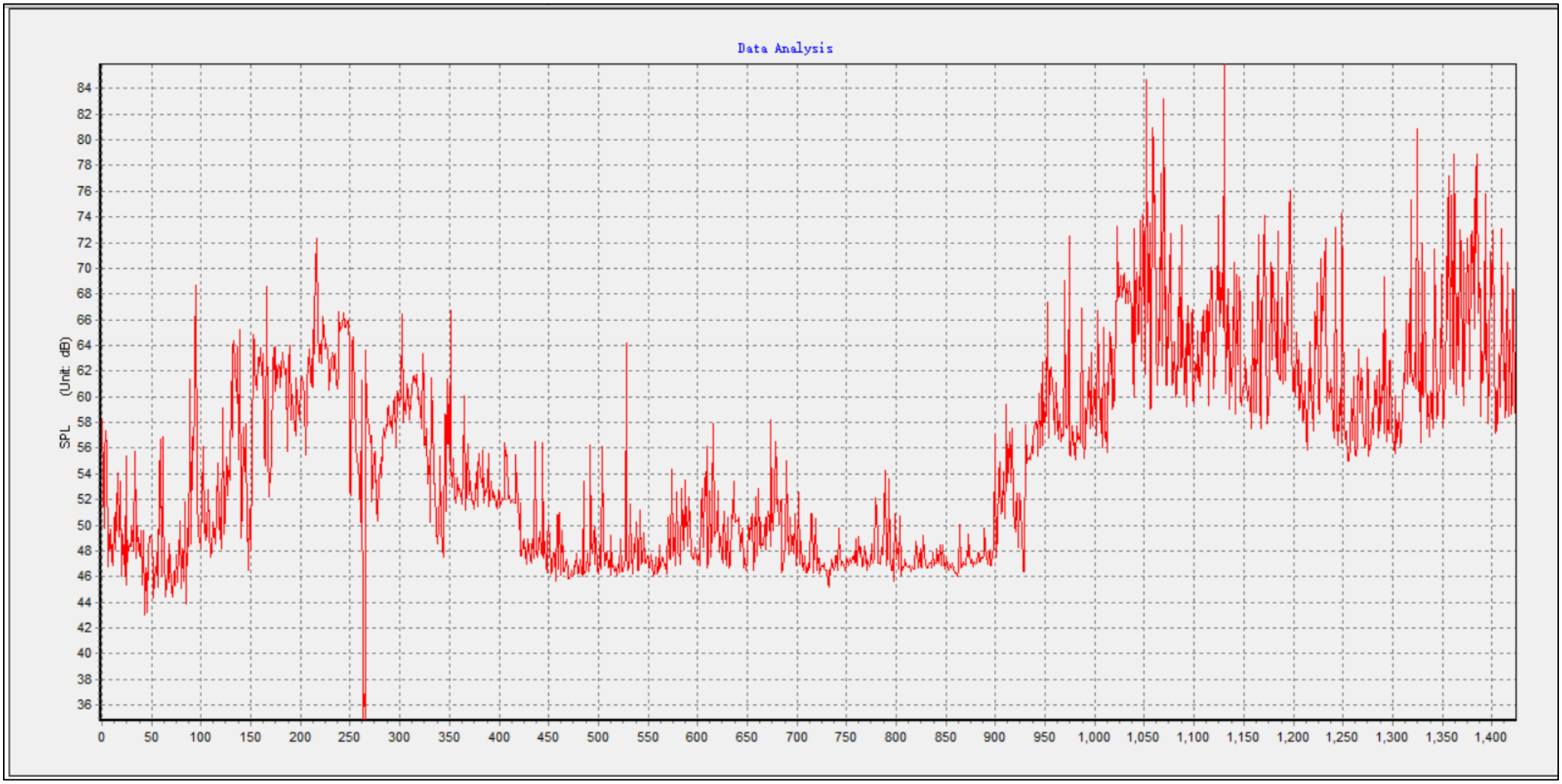

Figure 4. 11 Graph analysis of Noise Frequency at Point 1

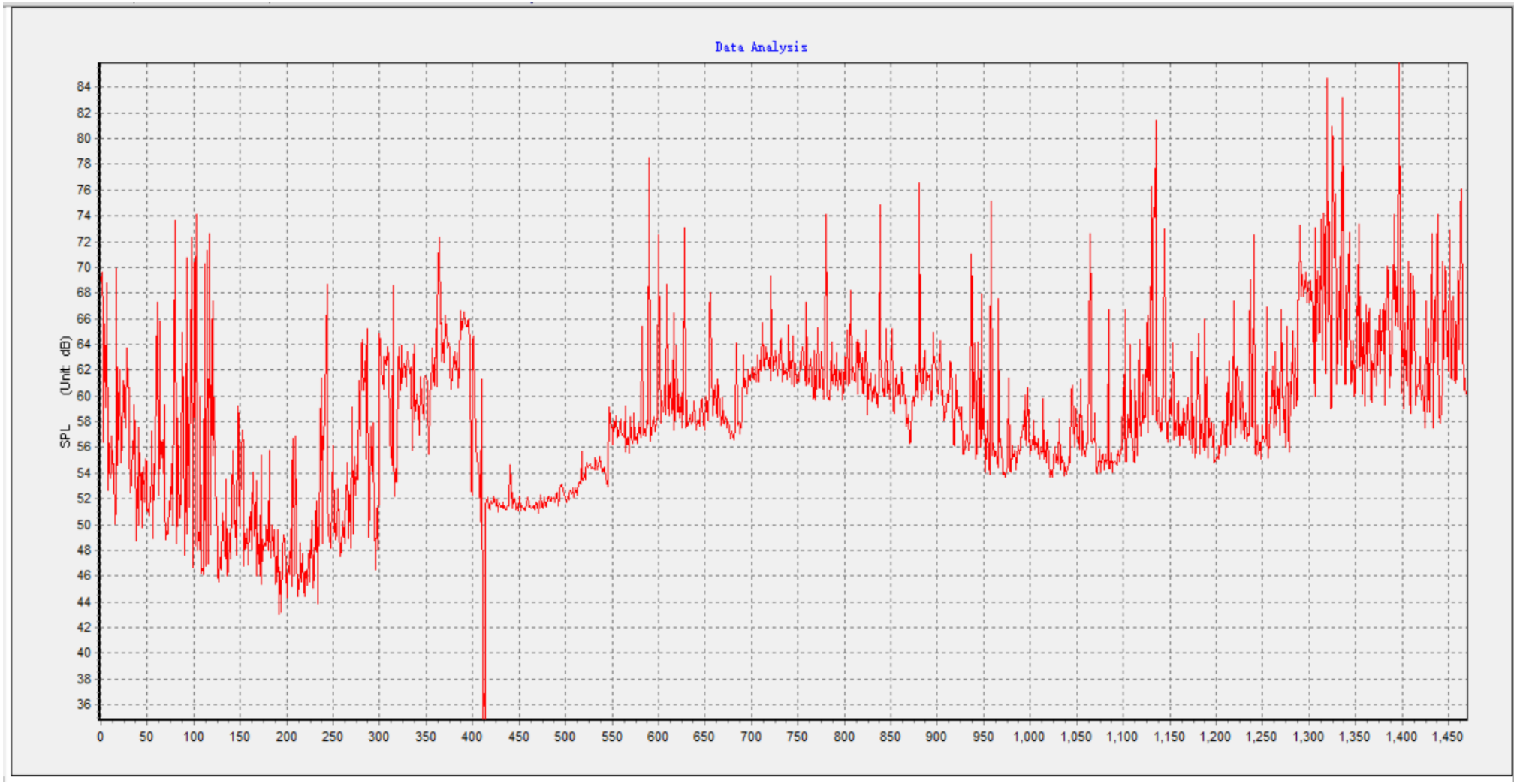

Figure 4. 12 Graph analysis of Noise Frequency at Point 2

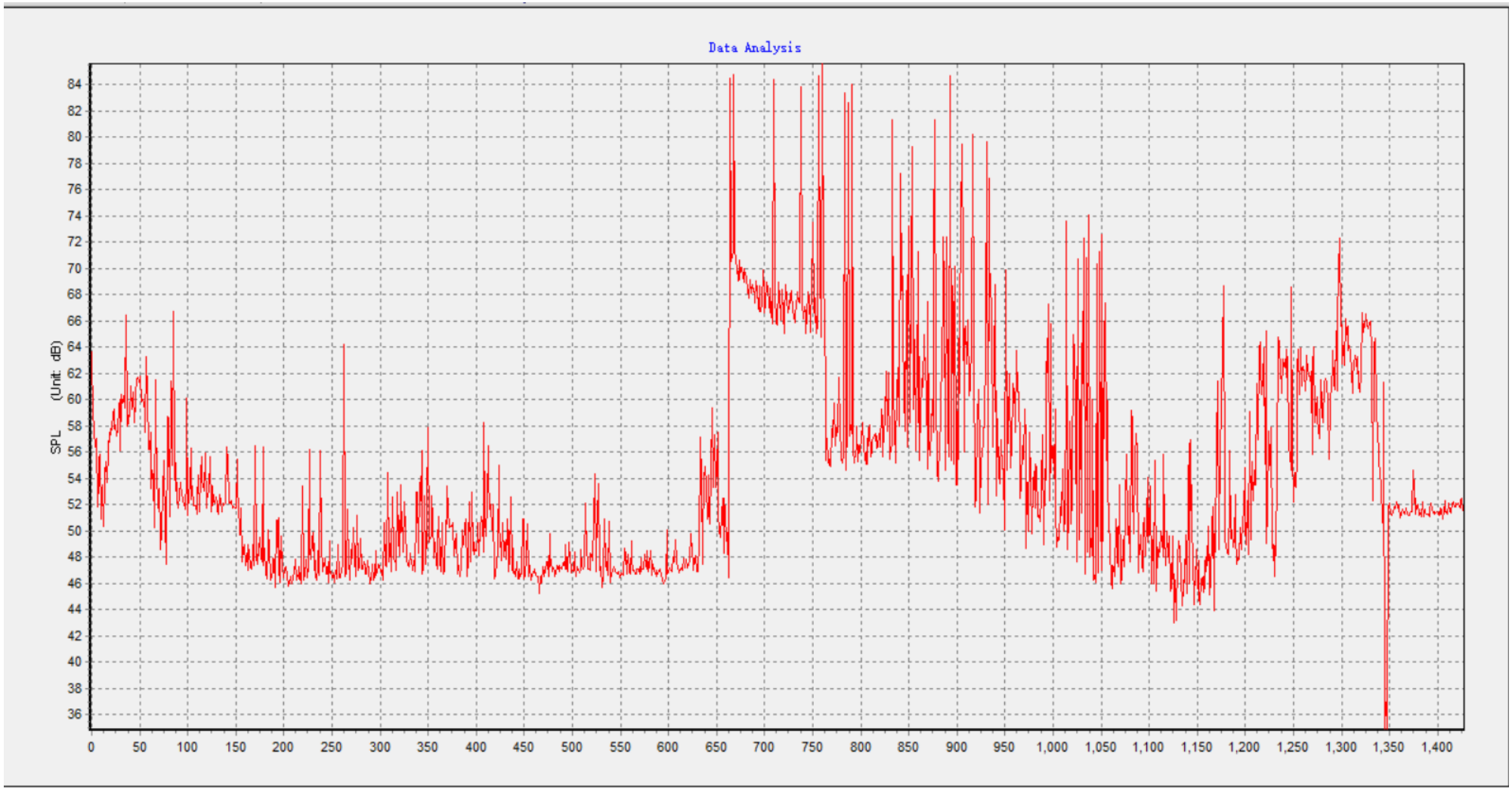

Figure 4. 13 Graph analysis of Noise Frequency at Point 3

4.5 Vibration Study

4.5.1 Purpose of the Vibration Study

A vibration study for the Taung Thaman Resort project aims to establish baseline data on ambient vibration levels within and around the proposed site. It assesses potential environmental impacts, identifies sensitive receptors, and helps develop mitigation strategies to minimize adverse effects. Compliance with regulatory standards and risk management are key considerations in ensuring responsible development practices and safeguarding structural integrity.

4.5.2 Methodology of Vibration Study

The vibration measuring methodology for the Taung Thaman Resort project involves careful selection and placement of vibration sensors to capture representative data across different zones. Standardized protocols are followed for data collection, including frequency analysis and statistical techniques to identify trends and anomalies. Threshold values are determined based on regulatory standards and industry guidelines to assess the significance of measured vibrations.

Extech 407860 Heavy Duty Vibration Meter has a Velocity range of 7.87 in./s or 200 mm/s; Acceleration range of 656 ft./s or 200 m/s, and Displacement range of 0.078 in. or 2 mm. It features a basic accuracy of 5%, a remote vibration sensor (magnetic or stud mounted) with a 39 in. (1 m) cable, RMS, Peak Value measurement modes, and auto/manual store with recall of up to 500 readings. The captured readings can be downloaded to your PC for further analysis using the optional Windows compatible data logging software. Meter comes complete with remote sensor, magnetic mount, 9V battery, holster with stand, and case.

4.5.3 Selection of the Vibration Meter Measurement

The locations chosen for vibration studies align with those selected for air quality measurements paragraph (4.3.3).

4.5.4 Observed Values of Vibration Meter

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Vibration Analysis Info / တုန်ခါမှုတိုင်းတာခြင်းအချက်အလက်

တုန်ခါမှုတိုင်းသည့်နေရာ Sample site:	Taung Tha Man Resort စီမံအုပ်ချုပ်မှုရုံးရှေ့	နမူနာအမှတ်စဉ်Sample I.D	034	
နေရာ (မြို့နယ်) Location (township)	အမရပူရမြို့နယ်	လတ်တီတွဒ် Latitude	N 21˚53′ 15.93″	
		လောင်ဂျီတွဒ် Longitude	E 096˚03′ 45.80″	
နေရာ (တိုင်း/ပြည်နယ်) Location (Region / state)	မန္တလေးတိုင်းဒေသကြီး	နည်းစနစ် Method	EXTECH (Model-407860) Heavy Duty Vibration Meter	
တိုင်းတာလိုသူ အမည် Name of customer:	Taung Tha Man Thitsar Resort	စတင်တိုင်းတာသည့်အချိန် (နေ့အချိန်) log on time (Date,Time)	19.9.2022	18:20 PM
တိုင်းတာသည့်နေ့စွဲ Air Sampling Testing Date	19/ 9 / 2022	တိုင်းတာပြီးသည့်အချိန်(နေ့အချိန်) log off time (Date,Time)	20.9.2022	18:20 PM
ဆက်သွယ်ရန် လိပ်စာ/ဖုန်း Contact Address/phone	-	တိုင်းတာမှု ကြာချိန် Logging Duration (hours)	24 hours	

Vibration Test Result /တုန်ခါမှုတိုင်းတာစမ်းသပ်ချက်အဖြေ

Testing Time	Testing Results (One Hour Average)	Guideline Value		
Day -Time	Unit – mm/s²	One Hour Average (m/s²)		
7:00-8:00	0.004	Receptor	Day-time 07:00- 22:00 (10:00-22:00 for Public holidays)	Night Time 22:00- 07:00 (22:00-10:00 for Public holidays)
8:00-9:00	0.006			
9:00-10:00	0.009			
10:00-11:00	0.009			
11:00-12:00	0.004	Residential, Institutional Educational	Preferred value	Maximum value
12:00-13:00	0.006		0.40*	0.80*
13:00-14:00	0.002			
14:00-15:00	0.005			
15:00-16:00	0.004			
16:00-17:00	0.002	Workshop	0.80*	1.60*
17:00-18:00	0.006			
18:00-19:00	0.025			
19:00-20:00	0.007			
20:00-21:00	0.010			
21:00-22:00	0.001			
Day-Time Average (mm/s²)	0.007			

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T.3esting Time	Testing Results (One Hour Average)	Guideline Value*		
Night -Time	**Unit – mm/s²**	**One Hour Average (m/s²)**		
22:00-23:00	**0.001**	**Receptor**	**Day-time 07:00- 10:00 (10:00-22:00 for Public holidays)**	**Night Time 10:00- 07:00 (22:00-10:00 for Public holidays)**
23:00-24:00	**0.004**			
00:00-1:00	**0.002**			
1:00-2:00	**0.001**			
2:00-3:00	**0.003**	Residential, Institutional Educational	**Preferred value**	**Maximum value**
3:00-4:00	**0.002**		0.40*	0.80*
4:00-5:00	**0.005**			
5:00-6:00	**0.003**	Workshop	0.80*	1.60*
6:00-7:00	**0.006**			
Night-Time Average (mm/s²)	**0.003**			

*** Department of Environment and Conservation (NSW) Guideline (2006)**

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Vibration Analysis Info / တုန်ခါမှုတိုင်းတာခြင်းအချက်အလက်

တုန်ခါမှုတိုင်းသည့်နေရာ Sample site:	စီမံကိန်းလုပ်ငန်းခွင်၏ ဆောက်လုပ်ရေးလုပ်ငန်းခွင်အနီး	နမူနာအမှတ်စဉ်Sample I.D	035	
နေရာ (မြို့နယ်) Location (township)	အမရပူရမြို့နယ်	လတ္တီတွဒ် Latitude	N 21˚53′ 05.83″	
		လောင်ဂျီတွဒ် Longitude	E 096˚03′ 50.96″	
နေရာ (တိုင်းဒေသကြီး/ပြည်နယ်) Location (Region / state)	မန္တလေးတိုင်းဒေသကြီး	နည်းစဉ် Method	EXTECH (Model-407860) Heavy Duty Vibration Meter	
တိုင်းတာလိုသူ အမည် Name of customer:	Taung Tha Man Thitsar Resort	စတင်တိုင်းတာသည့်ချိန် (နေ့အချိန်) log on time (Date,Time)	20.9.2022	19:01 PM
တိုင်းတာသည့်နေ့စွဲ Air Sampling Testing Date	20/ 9 / 2022	တိုင်းတာပြီးသည့်အချိန်(နေ့အချိန်) log off time (Date,Time)	21.9.2022	19:01 PM
ဆက်သွယ်ရန် လိပ်စာ/ဖုန်း Contact Address/phone	-	တိုင်းတာမှု ကြာချိန် Logging Duration (hours)	24 hours	

Vibration Test Result /တုန်ခါမှုတိုင်းတာစမ်းသပ်ချက်အဖြေ

Testing Time	Testing Results (One Hour Average)	Guideline Value		
Day -Time	Unit – mm/s²	One Hour Average (m/s²)		
7:00-8:00	0.005	Receptor	Day-time 07:00- 22:00 (10:00-22:00 for Public holidays)	Night Time 22:00- 07:00 (22:00-10:00 for Public holidays)
8:00-9:00	0.016			
9:00-10:00	0.018			
10:00-11:00	0.012			
11:00-12:00	0.014	Residential, Institutional Educational	Preferred value	Maximum value
12:00-13:00	0.016		0.40*	0.80*
13:00-14:00	0.012			
14:00-15:00	0.015			
15:00-16:00	0.014			
16:00-17:00	0.012	Workshop	0.80*	1.60*
17:00-18:00	0.016			
18:00-19:00	0.010			
19:00-20:00	0.010			
20:00-21:00	0.012			
21:00-22:00	0.010			
Day-Time Average (mm/s²)	0.013			

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T.3esting Time	Testing Results (One Hour Average)	Guideline Value*		
Night -Time	**Unit – mm/s²**	**One Hour Average (m/s²)**		
22:00-23:00	**0.001**	**Receptor**	**Day-time 07:00- 10:00 (10:00-22:00 for Public holidays)**	**Night Time 10:00- 07:00 (22:00-10:00 for Public holidays)**
23:00-24:00	**0.004**			
00:00-1:00	**0.002**			
1:00-2:00	**0.003**			
2:00-3:00	**0.005**	Residential, Institutional Educational	**Preferred value**	**Maximum value**
3:00-4:00	**0.002**		0.40*	0.80*
4:00-5:00	**0.008**			
5:00-6:00	**0.004**	Workshop	0.80*	1.60*
6:00-7:00	**0.001**			
Night-Time Average (mm/s²)	**0.003**			

*** Department of Environment and Conservation (NSW) Guideline (2006)**

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Analyzed by

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Checked by

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Laboratory In charge
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Vibration Analysis Info / တုန်ခါမှုတိုင်းတာခြင်းအချက်အလက်

<table>
<tr><td>တုန်ခါမှုတိုင်းတာသည့်နေရာ
Sample site:</td><td>စီမံကိန်းလုပ်ငန်းခွင်နှင့်အနီးဝန်းကျင်
ရှိကျေးရွာများအနီး</td><td>နမူနာအမှတ်စဉ်Sample I.D</td><td colspan="2">036</td></tr>
<tr><td rowspan="2">နေရာ (မြို့နယ်)
Location (township)</td><td rowspan="2">အမရပူရမြို့နယ်</td><td>လတ္တီတွဒ် Latitude</td><td colspan="2">N 21˚52′ 57.52″</td></tr>
<tr><td>လောင်ဂျီတွဒ် Longitude</td><td colspan="2">E 096˚03′ 57.21″</td></tr>
<tr><td>နေရာ (တိုင်းပြည်နယ်)
Location (Region / state)</td><td>မန္တလေးတိုင်းဒေသကြီး</td><td>နည်းစနစ် Method</td><td colspan="2">EXTECH (Model-407860)
Heavy Duty Vibration
Meter</td></tr>
<tr><td>တိုင်းတာလိုသူ အမည်
Name of customer:</td><td>Taung Tha Man Thitsar
Resort</td><td>စတင်တိုင်းတာသည့်အချိန် (နေ့အချိန်)
log on time (Date,Time)</td><td>21.9.2022</td><td>19:30 PM</td></tr>
<tr><td>တိုင်းတာသည့်နေ့စွဲ
Air Sampling Testing Date</td><td>21/ 9 / 2022</td><td>တိုင်းတာပြီးသည့်အချိန်(နေ့အချိန်)
log off time (Date,Time)</td><td>22.9.2022</td><td>19:30 PM</td></tr>
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Contact Address/phone</td><td>-</td><td>တိုင်းတာမှု ကြာချိန်
Logging Duration (hours)</td><td colspan="2">24 hours</td></tr>
</table>

Vibration Test Result /တုန်ခါမှုတိုင်းတာစမ်းသပ်ချက်အဖြေ

<table>
<tr><th>Testing Time</th><th>Testing Results (One Hour Average)</th><th colspan="3">Guideline Value</th></tr>
<tr><th>Day -Time</th><th>Unit – mm/s²</th><th colspan="3">One Hour Average (m/s²)</th></tr>
<tr><td>7:00-8:00</td><td>0.013</td><td rowspan="4">Receptor</td><td rowspan="4">Day-time
07:00- 22:00
(10:00-22:00 for Public holidays)</td><td rowspan="4">Night Time
22:00- 07:00
(22:00-10:00 for Public holidays)</td></tr>
<tr><td>8:00-9:00</td><td>0.008</td></tr>
<tr><td>9:00-10:00</td><td>0.016</td></tr>
<tr><td>10:00-11:00</td><td>0.005</td></tr>
<tr><td>11:00-12:00</td><td>0.004</td><td rowspan="5">Residential,
Institutional
Educational</td><td>Preferred value</td><td>Maximum value</td></tr>
<tr><td>12:00-13:00</td><td>0.016</td><td rowspan="4">0.40*</td><td rowspan="4">0.80*</td></tr>
<tr><td>13:00-14:00</td><td>0.002</td></tr>
<tr><td>14:00-15:00</td><td>0.003</td></tr>
<tr><td>15:00-16:00</td><td>0.014</td></tr>
<tr><td>16:00-17:00</td><td>0.012</td><td rowspan="6">Workshop</td><td rowspan="6">0.80*</td><td rowspan="6">1.60*</td></tr>
<tr><td>17:00-18:00</td><td>0.006</td></tr>
<tr><td>18:00-19:00</td><td>0.003</td></tr>
<tr><td>19:00-20:00</td><td>0.002</td></tr>
<tr><td>20:00-21:00</td><td>0.003</td></tr>
<tr><td>21:00-22:00</td><td>0.001</td></tr>
<tr><td>Day-Time Average (mm/s²)</td><td>0.007</td><td></td><td></td><td></td></tr>
</table>

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T.3esting Time	Testing Results (One Hour Average)	Guideline Value*		
Night -Time	Unit – mm/s²	One Hour Average (m/s²)		
22:00-23:00	0.001	Receptor	Day-time 07:00- 10:00 (10:00-22:00 for Public holidays)	Night Time 10:00- 07:00 (22:00-10:00 for Public holidays)
23:00-24:00	0.004			
00:00-1:00	0.002			
1:00-2:00	0.001			
2:00-3:00	0.001	Residential, Institutional Educational	Preferred value	Maximum value
3:00-4:00	0.005		0.40*	0.80*
4:00-5:00	0.002			
5:00-6:00	0.001	Workshop	0.80*	1.60*
6:00-7:00	0.002			
Night-Time Average (mm/s²)	0.002			

* Department of Environment and Conservation (NSW) Guideline (2006)

တိုင်းတာတွက်ချက်သူ

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4.6 BIODIVERSITY

4.6.1.1 Introduction

Taung Thanmann Lake is situated in the Amarapura Township, positing at 21˚54″ N, 96˚ 03″ E, and the water body of the Lake is approximately 600ha.The river water of Dokhtawady and Ayeyarwaddy flow into the lake from the south and west. Taung Thaman Lake is a large floodplain transformed into a permanent Lake. In Indo-Burma Hotspot, it is a key biodiversity area with coding site MMR11. A Famous Spot nearby Taung Thaman Lake U Pein Bridge near Mandalay City would be a Resort Hotel Project. "Myanmar Traditional Culture and Taung Thaman Country Resort" entitled Project would be constructed in the East of U Pein Bridge and Taung Thaman Lake adjacent over 40 acres by Private-owned Taung Thaman Thitsar Company. There would be many Hotel rooms, Resort Park, Traditional Culture, Handicraft Malls included Myanmar Traditional Culture and Taung Thaman Resort Project cost 300 billion Kyat round would be invested.

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

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

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

In this study, MBG has focused "Biological Baseline Study and Impact Assessment of "Myanmar Traditional Culture and Taung Thaman Country Resort" Project. It will be considered to identify the biological impacts, existing biological condition, the biological impacts, and mitigation measure for environmental protection management.

4.6.2 Objectives of Study

In Indo-Burma Hotspot, Taung Thaman Lake is a key biodiversity area with coding site MMR113. It was established in Indo –Burma biodiversity Hotspot there were 172 species which are globally threatened in Myanmar. It can be expressed as taxonomic group in mammals 43, birds 41, reptiles 23, amphibians 0, fish16, invertebrates 4 and plants 45.

The following facts are being studied by MBG.

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

4.6.3 Methodology on Biodiversity Baseline Study

In biological environment, the status of the flora and fauna of the study area was determined by a review of literature relevant to the area and field investigations for both the terrestrial and wetland environments. The vegetative communities were identified and classified into community types. Identification was carried out of dominant tree species. The vegetation was identified and described for the property.

Information on fauna was gathered from existing literature on reported species as well as observations in the field. Observations were made particularly to assess the presence of birds in the terrestrial and wet land environments. Information was obtained from locals in the area about the presence of any significant specie.

In the case of fishery, the permanent water body has 600ha. Apart from involving the local communities in the exploitation of the resource, the lessee has also introduced protected areas that have been identified as tilapia breeding grounds and also releases some other species. There is a certain amount of feeding at the time that the lease floods, allegedly to prevent fish from migrating from the lease. All species of fish are vulnerable to various parasitic infections depending on the species of fish and the type of stream inhabited. Some of the factors that enhance parasitic infection in fishes include reduced oxygen content of water, increase in organic matter, in the water, poor environmental conditions.

In order to obtain essential ecological data and representative checklists of the flora and fauna species, data collection was also carried out by random transect lines within the direct impact zone and indirect impact zone of the project site. The families were identified by using

key to families of flowering plants, issued by Department of Botany, Yangon University (1994), and Birds of Myanmar (2005).

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.

4.6.4 Assessment Method

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

1. Identification of the potential biological impacts of the construction and/ or operation of the proposed project or activity, including habitat changes or loss, chemical cycling and toxic events, and disruptions to ecological succession.
2. Description of the environmental setting in terms of habitat types, selected floral and faunal species, management practices, endangered or threatened species, and special features.
3. Procurement of relevant laws, regulations, or criteria related to biological resources and protection of habitat or species
4. Conduction of impact prediction activities, including the use of analogies (case studies), physical modeling, and/or mathematical modeling, based on judgment
5. Use of pertinent information, along with professional judgment and public input, in access the significant or anticipated beneficial and detrimental impacts
6. Identification, development, and incorporation of appropriate mitigation measures for the adverse impacts

4.6.5 Data Assessment on Existing Biological Conditions

Floral components and faunal components are assessed in both direct and indirect sites of the proposed project. Table (4-12) and Figure (8-16) are assessment data for proposed project. There is no species which is endangered or threaten species and also endemic species checked in IUCN Red List Category.

4.6.5.1 Diversity of Birds

A field survey was conducted as part of the Strategic Environmental Assessment identifies existing avifauna on the site. Taung Thaman Lake is not only wet land but also inland fishery

area. Forty-five species of birds were recorded in the target area. Most of birds were wetland birds. There was no endangered or threaten species and also endemic species.

Table 4. 12 List of Avifauna in the Impact Zone

No.	Local Name	Common Name	Scientific Name	Family Name	IUCN Red List	
					Status	Population Trend
1.	Boat	Greater Coucal	Centropus sinensis	Cuculidae	Least Concern	Stable
2.	But	Black Bulbul	Hypsipetes leucocephalus	Pycnono-tidae	Least Concern	Stable
3.	But-chwe	Streak-eared Bulbul	Pycnonotus blanfordi	Pycnono-tidae	Least Concern	Stable
4.	But-ka-lon	Red-whiskered Bulbul	Pycnonotus jocosus	Pycnono-tidae	Least Concern	Decreasing
5.	But-phin-ni	Red-Vented Bulbul	Pycnonotus cafer	Pycnono-tidae	Least Concern	Increasing
6.	Byine	Little egret	Egretta garzetta	Ardeidae	Least Concern	Increasing
7.	Byineng an	Great egret	Casmerodius albus	Ardeidae	Least Concern	Unknown
8.	Byine-ouk	Indian Pond hero	Ardeola grayii	Ardeidae	Least Concern	Unknown
9.	Din-gyi	Little Cormorant	Phalacrocorax niger	Phalacro-coracidae	Least Concern	Unknown
10.	Eain-sar	House Sparrow	Passer domesticus	Passeridae	Least Concern	Decreasing
11.	Hin-Thar	Ruddy Shelduck	Tadorna ferruginea	Anatidae	Least Concern	Unknown
12.	HngetHka	Indian Roller	Coracias benghalensis	Coraciidae	Least Concern	Increasing
13.	HngetKyar	Pied Bushchat	Saxicola caprata	Turdidae	Least Concern	Stable

14.	Hnget-pasin-hto	Green bee-eater	Merop sorientalis	Meropidae	Least Concern	Increasing
15.	Joe-Le-Pyauk	Spotted Dove	Streptopelia chinensis	Columbidae	-	-
16.	Kha-Yu-Sote	Glossy Ibis	Plegadis falcinellus	Threskiornithidae	Least Concern	Decreasing
17.	Kho	Rock Dove	Columba livia	Columbidae	Least Concern	Decreasing
18.	KyayKyote	Parrot	Psittacula krameri	Psittaculi-dae	Least Concern	Increasing
19.	Kyi- kan	House Crow	Corvus splendens	Corvidae	-	Stable
20.	Kywe-gyaung-byaing	Cattle egret	Ardeola ibis	Ardeidae	Least Concern	Increasing
21.	Lin-mi-zwe	Black Drongo	Dicrurus macrocercus	Dicruridae	Least Concern	Unknown
22.	Lin-wet	Black-crowned Night Hero	Nyctiorax nycticorax	Ardeidae	-	-
23.	Nga Hit Mwe	Grey Heron	Ardea cinerea	Ardeidae	Least Concern	Unknown
24.	Ngone	Rain Quail	Coturnix coromandelica	Phasianidae	Least Concern	Stable
25.	Oat all	Asian Koel	Eudynamys scolopacea	Cuculidae	Least Concern	Stable
26.	Pain Nyin	White-throated kingfisher	Halcyon smyrnensis	Halcyoni-dae	Least Concern	Increasing
27.	PyanHl war	Red-rumped Swallow	Hirundo striolata	Hirundini-dae	-	-

28.	SarWa Tee	Scaly-Breasted Munia	Lonchura punctulata	Estrildinae	Least Concern	Stable
29.	Shwe Pyi Soe	Common Iora	Aegithina tiphia	Aegithini-dae	Least Concern	Unknown
30.	Sissali	Lesser Whistling Duck	Dendrocygna javanica	Dendrocyg-nidae	Least Concern	Decreasing
31.	Snipe	Common snipe	Gallinago gallinago	Scolopaci-dae	Least Concern	Decreasing
32.	Swin	Black Kite	Milvus migrans	Accipitrida e	Least Concern	Unknown
33.	Taung Pee Sue	Common Hoopoe	Upupa epops	Upupidae	Least Concern	Decreasing
34.	Tha Bate Lwe	Oriental Magpie Robin	Copsychus saularis	Turdidae	Least Concern	Stable
35.	Titaetoo	Red-wattled Lapwing	Vanellus indicus	Charadrii-dae	Least Concern	Unknown
36.	WityiSo at	Olive-backed sunbird	Nectarinai jugularis	Nectariniі-dae	-	-
37.	Ye Kyat	Common Moorhen	Gallinula chloropus	Rallidae	Least Concern	Stable
38.	Ye Nyaunt	Green sandpiper	Tringa ochropus	Scolopaci-dae	Least Concern	Stable
39.	Za-yet	Common Myna	Acridotheres tristis	Sturnidae	Least Concern	Increasing
40.	Za-yet Taung-pan Phyu	Chestnut-tailed starling	Sturnus malabaricus	Sturnidae	Least Concern	Unknown
41.	Zee gwat	Spotted Owlet	Athene brama	Strigidae	Least Concern	Stable

42.	Zwe	White-throated Babbler	Turdoides gularis	Turdoidinae	Least Concern	Stable
43.	-	Little-pied Flycatcher	Ficedula westermanni	Muscicapi-dae	Least Concern	Decreasing
44.	-	Paddy field Pipit	Anthus rufulus	Motacilli-dae	Least Concern	Stable
45.	-	White-vented Myna	Acridotheres grandis	Sturnidae	Least Concern	Stable

Pycnonotus blanfordi

Psittacula krameri

Casmerodius albus

Ardeola grayii

Egretta garzetta

Phalacrocorax niger

	
Plegadis falcinellus	*Ardea cinerea*
	
Dicrurus macrocercus	*Nectarinia jugularis*
	
Anthus rufulus	*Halcyon smyrnensis*
	
Hirundo striolata	*Lonchura punctulata*

	
Gallinago gallinago	*Sturnus malabaricus*
	
Streptopelia chinensis	*Acridotheres grandis*
	
Aegithina tiphia	*Acridotheres tristis*
	
Saxicola caprata	*Upupa epops*

Merops orientalis

Turdoides gularis

Figure 4. 14 Some of Avifauna Rocorded from the Survey Area

4.6.5.2 Diversity of Terrestrial Flora

The flora diversity exists in wetland, on-land, and cultivated land. Six species of aquatic (kaing, baydar, kyu…etc.), thirty-six species of on-land trees (meze, magyi, htan, htein are mostly abundant), and ten species of vegetation (paddy, groundnut, sunflower…). Many micro algae species exist but are not recorded. There was no endangered or threaten species and also endemic species.

Table 4. 13 List of Flora in the Impact Zone

No.	Common Name	Scientific Name	Family Name	Habit
1.	Anya-kokko	*Albizia lebbek*	Mimosaceae	Tree
2.	Thin Baw-kokko	*Albizia julibrissin*	Mimosaceae	Tree
3.	Banda	*Terminalia catappa L.*	Combretaceae	Tree
4.	Bawdi-nyaung	*Ficus religiosa L.*	Moraceae	Tree
5.	Bawzagaing	*Leucaena leucocephala*	Mimosaceae	Tree
6.	Dan-da-lun	*Moringa oleifera Lam*	Moringaceae	Tree
7.	Eu-ca-lit	*Eucalyptus ovataLabill.*	Myrtaceae	Tree
8.	Gwe	*Spondias mangifera*	Anacardiaceae	Tree
9.	Htan	*Borassus flabellifer*	Arecaceae	Tree
10.	Hta-Naung	*Acacia leucophloea*	Mimosaceae	Tree
11.	Htein	*Mitragyna parvifolia*	Rubiaceae	Tree
12.	Kathit	*Erythrinaarborescens*	Fabaceae	Tree
13.	Kyi	*Barringtonia acutangula*	Lecythidaceae	Tree
14.	Lale	*Meliosma simplicifolia*	Meliosmaceae	Tree

15.	La-pan	*Beaumontia grandiflora*	Apocynaceae	Tree
16.	Magyi	*Tamarindus indica*	Fabaceae	Tree
17.	Mezali	*Sennas iamea*	Fabaceae	Tree
18.	Meze	*Madhu calongifolia*	Sapotaceae	Tree
19.	Ngu	*Cassia fistula*	Caesalpiniaceae	Tree
20.	NyaungPeinne	*Ficus altissima*	Moraceae	Tree
21.	Ohn	*Cocos nucifera*	Arecaceae	Tree
22.	Okhne	*Streblus asper*	Moraceae	Tree
23.	Padauk	*Pterocarpus marsupium*	Fabaceae	Tree
24.	Pinle-kabwe	*Casuarina equisetifolia*	Casuarinaceae	Tree
25.	PyaukSeik	*Holoptelea integrifolia*	Ulmaceae	Tree
26.	Seinban(Ni)	*Delonix regia*	Caesalpiniaceae	Tree
27.	Sha	*Ancacia catechu*	Mimosaceae	Tree
28.	Subyu	*Ancacia nilotica*	Mimosaceae	Tree
29.	Tama	*Azadirachta indica*	Meliaceae	Tree
30.	Ta zaung	*Euphorbia neriifolia*	Euphorbiaceae	Small Tree
31.	Tayok-magyi	*Pithecellobium dulce*	Mimosaceae	Tree
32.	Thayet	*Mangifera indica L.*	Anacardiaceae	Tree
33.	Thabye	*Eugenia bracteolata*	Myrtaceae	Tree
34.	Thi	*Limonia acidissima*	Rutaceae	Tree
35.	Ye Thapan	*Ficus glomerata*	Moraceae	Tree
36.	Zi	*Ziziphus jujube Lam.*	Rhamnaceae	Tree

Madhu calongifolia

Tamarindus indica

	
Holoptelea integrifolia	*Meliosma simplicifolia*
	
Azadirachta indica	*Cedrela febrefuga*
	
Terminalia catappa	*Pithecellobium dulce*
	
Albizia julibrissin	*Beaumontia grandiflora*

Barringtonia acutangula

Cassia fistula

Streblus asper

Limonia acidissima

Figure 4. 15 Some of Flora Species Recorded from the Survey Area

Table 4. 14 List of Flora in the Impact Zone (Vegetation and Gardening)

No.	Common Name	Scientific Name	Family Name
1.	Banana	*Musa ornata*	Musaceae
2.	Maize	*Zea mays*	Poaceae
3.	Green Gram	*Phaseolus aureus*	Fabaceae
4.	Groundnut	*Arachis hypogaea*	Fabaceae
5.	Rice	*Oryza sativa*	Gramineae
6.	Sesame	*Sesamum indicum*	Pedaliaceae
7.	Sorghum	*Sorghum bicolor*	Poaceae
8.	Sunflower	*Helianthus annuus*	Asteraceae
9.	Thayet	*Mangifera indica L.*	Anacardiaceae
10.	Kazun	*Ipomoea batatas*	Convolvulaceae

Helianthus annuus

Phaseolus aureus

Sorghum bicolor

Arachis hypogaea

Oryza sativa

Ipomoea batatas

Figure 4. 16 Vegetation in the Survey Area

Table 4. 15 List of Aquatic Flora in the Impact Zone

No.	Local Name	Common Name	Scientific Name	Family Name
1.	Bay dar	Common water-hyacinth	*Eichhornia crassipes*	Pontederiaceae
2.	Kaing	-	*Mnesithea striata*	Poaceae
3.	Kana phaw	-	*Enhydra fluctuans*	Asteraceae
4.	Kyu	Reed	*Arundo donax*	Gramineae

5.	Pait-Swal	Narrow-leaved and hybrid cat-tail	*Typha angustifolia*	Typhaceae
6.	Ye Kazun	-	*Ipomaea aquatica*	Convolvulaceae

Eichhornia crassipes

Ipomaea aquatica

Typha angustifolia

Mnesithea striata

Arundo donax

Figure 4. 17 Some Aquatic Plants in the Survey Area

4.6.5.3 Fish Diversity

Six fish species were purchased from commercial fisherman, namely *Wallago attu, Channa striatus, C. orientalis, C. puntatus, Mastacembelus armatus*, and *M. zebrinus* recorded by Khaing Thazin Win, Nwe Nwe San. "The Occurrence of Helminth Parasites in Some Bony Fishes from Taung Thaman Lake, Amarapura Township" in MS Thesis (2011-2012). Of the

156 fishes examined, only 91 fishes were infected with any of the five species of *nematoses, Cucullanus sp, Eustrongylides wenrichi, Camallanus ophicephali, Hetrotyphlum calcarifum, and Capillaria sp.*; two species of *acanthocephalans, Rhadinorhynchus celebesense,* and *Pallisentis nandai*; four species of *cestodes, Bovienia serialis, Ancistrocephalus polyptera, Lytocestus longicollis*, and *Khawia sinensis*; and three species of *trematodes, Dactylostostomum gracile, Poracanthium mastacembellum*, and *Hapladena sp*. A total of 263 parasites were recorded in the 91 infected fish. Moreover, fourteen species of fishes were recorded by MBG in 2015. There was no endangered or threaten species and also endemic species.

Table 4. 16 List of Fish Species in the Impact Zone

No.	Common Name	Scientific Name	Family Name	IUCN Red List	
				Status	Population Trend
1.	Nga Bat	*Wallagonia attu*	Siluridae	-	-
2.	NgaChaung	*Mystus nemurus*	Bagridae	-	-
3.	NgaGyin	*Cyprinus carpio*	Cyprinidae	Vulnerable	Unknown
4.	NgaKhu	*Clarias batrachus*	Clariidae	Least Concern	Unknown
5.	NgaMyin	*Pangasianodon gigas*	Pangasiidae	Critically Endangered	Decreasing
6.	NgaMyit Chin	*Hampala macrolepidota*	Cyprinidae	Least Concern	Unknown
7.	Nga Mwedoe	*Macrognathus siamensis*	Mastacembelidae	Least Concern	Unknown
8.	Nga Nat Pyar	*Morulius chrysophekadion*	Cyprinidae	-	-
9.	NgaPhal	*Notopterus notopterus*	Notopteridae	Least Concern	Unknown
10.	NgaPyin	*Helostoma temmincki*	Helostomatidae	Least Concern	Stable
11.	NgaWat Ma	*Tilapia nilotica*	Cichlidae	-	-
12.	NgaYant	*Channa striatus*	Channidae	-	-

13.	NgaZin Sat	*Chanda ranga*	Ambassidae	Least Concern	Stable
14.	NgaZinYine	*Arius truncates*	Ariidae	-	-

Figure 4. 18 Common Fish Species, Tilapia nilotica, in the Survey Area

4.6.5.4 Diversity of Butterfly and Odonate Species

This area is a key biodiversity of Indo-Burma Hot Spot. There are many varieties existing in this ecological environment. Fourteen species of butterfly, ten species of odonate, and eight species of rodents and reptiles were recorded. There was no endangered or threaten species and also endemic species.

Table 4. 17 List of Butterfly species in the Impact Zone

No.	**Scientific Name**	**Family Name**	**IUCN Red List**	
			Status	**Population Trend**
1.	*Acraea terpsicore*	Nymphalidae	-	-
2.	*Appias libythea*	Pieridae	-	-
3.	*Catopsilia pomona*	Pieridae	-	-
4.	*Catopsilia pyranthepyranthe*	Pieridae	-	-
5.	*Danaus chrysippus*	Danaidae	-	-
6.	*Danaus limniace*	Danaidae	-	-
7.	*Eurema hecabe*	Pieridae	-	-
8.	*Hypolimnasmisippus linnaeus*	Nymphalidae	-	-
9.	*Ixias pyreneverna*	Pieridae	-	-

10.	*Junonia atlites*	Nymphalidae	-	-
11.	*Junonia hierta*	Nymphalidae	Least Concern	Unknown
12.	*Papilio demoleus*	Papilionidae	-	-
13.	*Papilio polytesromulus*	Papilionidae	-	-
14.	*Pieris rapae*	Pieridae	-	-

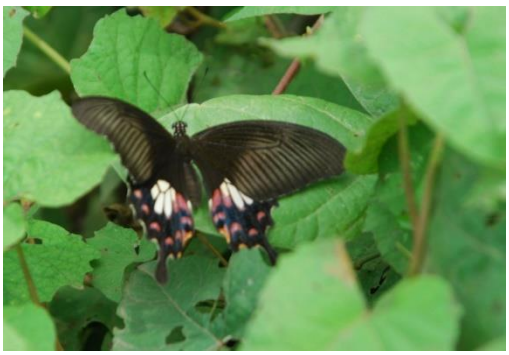
Acraea terpsicore

Pieris rapae

Junonia atlites

Hypolimnasmisippus linnaeus

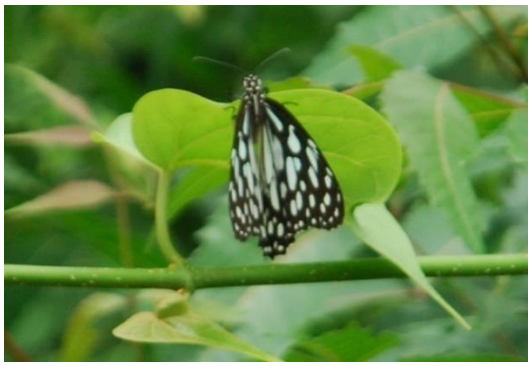
Danaus chrysippus



Papilio polytes romulus

Catopsilia pyranthe pyranthe

Papilio demoleus



Danaus limniace

Figure 4. 19 Some of Butterfly Species Recorded from the Survey Area

Table 4. 18 List of Odonate in the Impact Zone

No.	Scientific Name	Family Name	IUCN Red List	
			Status	Population Trend
1.	*Brachythemis contaminate*	Libellllulidae	-	-
2.	*Bradinopyga geminate*	Libellllulidae	-	-
3.	*Diplacodes trivialis*	Libellllulidae	Least Concern	Unknown
4.	*Neurothemis tullia*	Libellllulidae	Least Concern	Unknown
5.	*Orthetrum sabina*	Libellllulidae	Least Concern	Stable
6.	*Pantala flavescens*	Libellulidae	Least Concern	Stable
7.	*Rhodothemis rufa*	Libellllulidae	Least Concern	Unknown
8.	*Rhyothemis phyllis*	Libellllulidae	Least Concern	Unknown
9.	*Rhyothemis variegata*	Libellllulidae	Least Concern	Unknown
10.	*Trithemis kirbyi*	Libellllulidae	Least Concern	Increasing

Rhodothemis rufa

Pantala flavescens

Brachythemis contaminate

Diplacodes triviali

Rhyothemis phyllis

Figure 4. 20 Some of Odonate Recorded from the Survey Area

Table 4. 19 List of Rodents and Reptiles in the Impact Zone

No.	Local Name	Common Name	Scientific Name	Family Name	IUCN Red List	
					Status	Population Trend
1.	Kin-late-shaw	Common sun skink	Mabuya multifasciata	Scincidae	-	-
2.	Lin-mway	Banded rat snake	Ptyas mucosus	Colubridae	-	-

3.	Mwaypway	Viper	Daboia russelii	Viperidae	Least Concern	Decreasing
4.	MyawHout	Cobra	Ophiophagus hannah	Elapidae	Vulnerable	Decreasing
5.	Poat thin nyo	Blue crested lizard	Calotes mystaceus	Agamidae	-	-
6.	Tat-too	Garden fence lizard	Calotes versicolor	Agamidae	-	-
7.	Shint	Squirrel	Sundasciurus tenuis	Sciuridae	Least Concern	Decreasing
8.	Yal-myay	Chequered keel back	Xenochrophis piscator	Colubridae	-	-

Sundasciurus tenuis

Xenochrophis piscator

Figure 4. 21 Some of Rodent and Reptile Species Recorded from the Survey Area

Flora/Fauna	**Species**	**Genera**	**Families**
Aquatic Flora	6	6	6
Avifauna	45	41	31
Butterfly	14	10	5
Fish Fauna	14	14	12

Flora	36	32	20
Odonate	10	9	1
Rodent and Reptile	8	7	5
Vegetation	10	10	8
Total	143	129	88

Figure 4. 22 Direct Impact Zone of Project Site

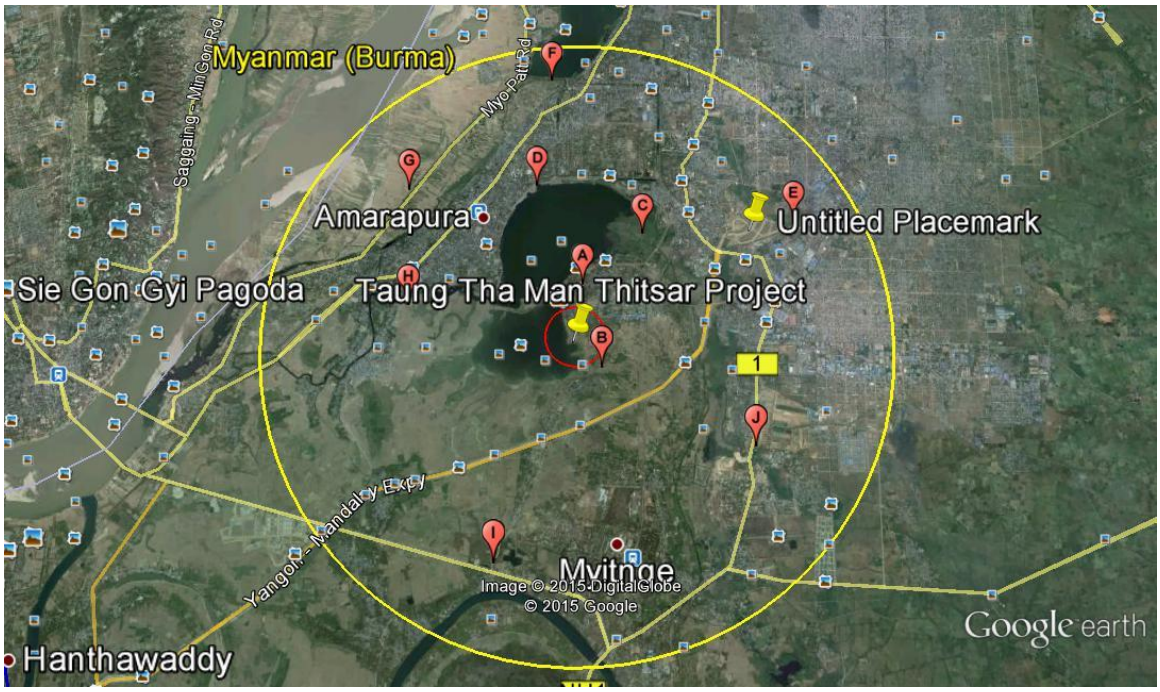


Figure 4. 23 Indirect Impact Zone of Project Site

4.7 SOCIOECONOMICS

Socioeconomics profile of the local communities including Taung Thaman village, Nwar-noe Taw Su village, Ywar Thit village and Tae Nan Thar village are established by the data obtained by a systematic household data survey. Sample size is calculated using Cochran formula with a confidence level of 95% and a margin of error 5%. There are about (514) numbers of households in the villages where (221) numbers of households were sampled.

4.7.1 Age Groups

Children under five years are 7.4% of total population where elderly over 64 years accounts about 3.7%. Together these two age groups which are solely dependent on other age groups sums up more than 11.1% of total population in the area. More than 66.4% of the people living in the study area falls under the age group of 16 years to 64 years. This group is mainly consisting of workforces of local community.

Table 4. 20 Age Groups and Sex of Local Community

Sr	Age Group	Frequency	Percent %
1	<5	74	7.4
2	5-16	225	22.5
3	16-64	664	66.4
4	>64	37	3.7
Total		1000	100.0

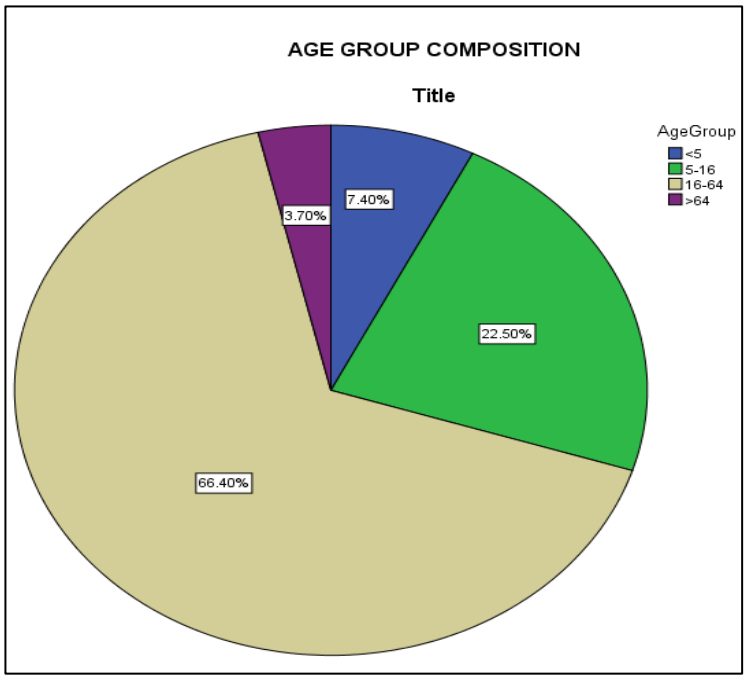


Figure 4. 24 Age Groups

4.7.2 Gender Ratio

There are 98 male in every 100 female population. Gender ratio could be seen in the following table. Since national gender ration is 93:100 and regional gender ration for Mandalay Region is 90.5 according to 2014 population and housing census, local gender ratio in project area a litter higher than national as well as regional gender ratio.

Table 4. 21 Gender Composition of Local Community

Sr.	Gender	Frequency	Percent %
1	Male	496	49.6
2	Female	504	50.4
Total		1000	100.0

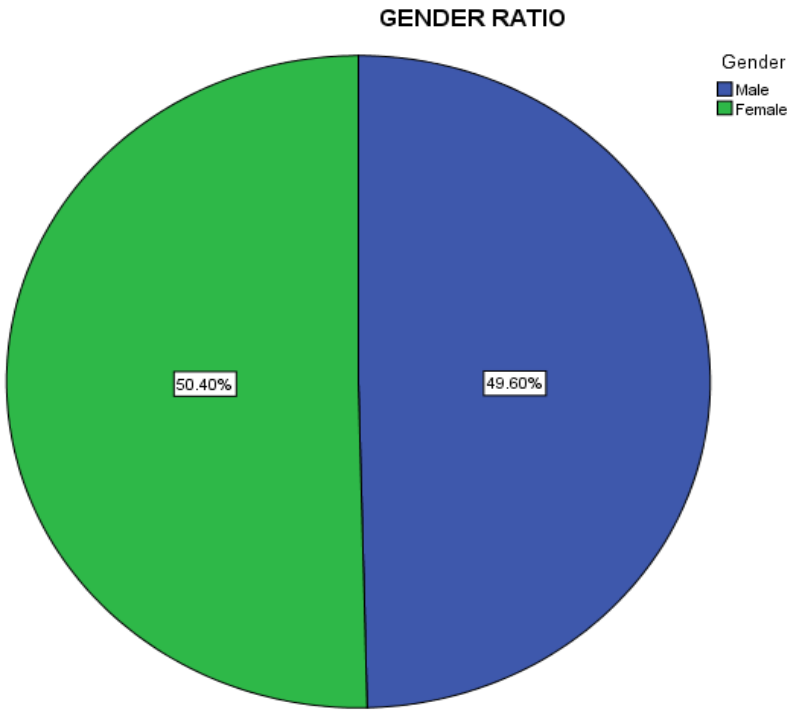


Figure 4. 25 Gender Ratio of Local Community

4.7.3 Marital Status

Single people population in local community is higher than national level and married population is lower comparing the survey result with 2014 population and housing census. Divorced and widowed population is also lower in local community as can be seen in the following table.

Table 4. 22 Marital Status of Local People

Sr.	Marital Status	Frequency	Local %	National% (census 2014)
1	Single	495	49.5	31.13
2	Married	472	47.2	60.10
3	Divorced	2	0.2	1.74
4	Widowed	31	3.1	7.04
Total		1000	100.0	100.0

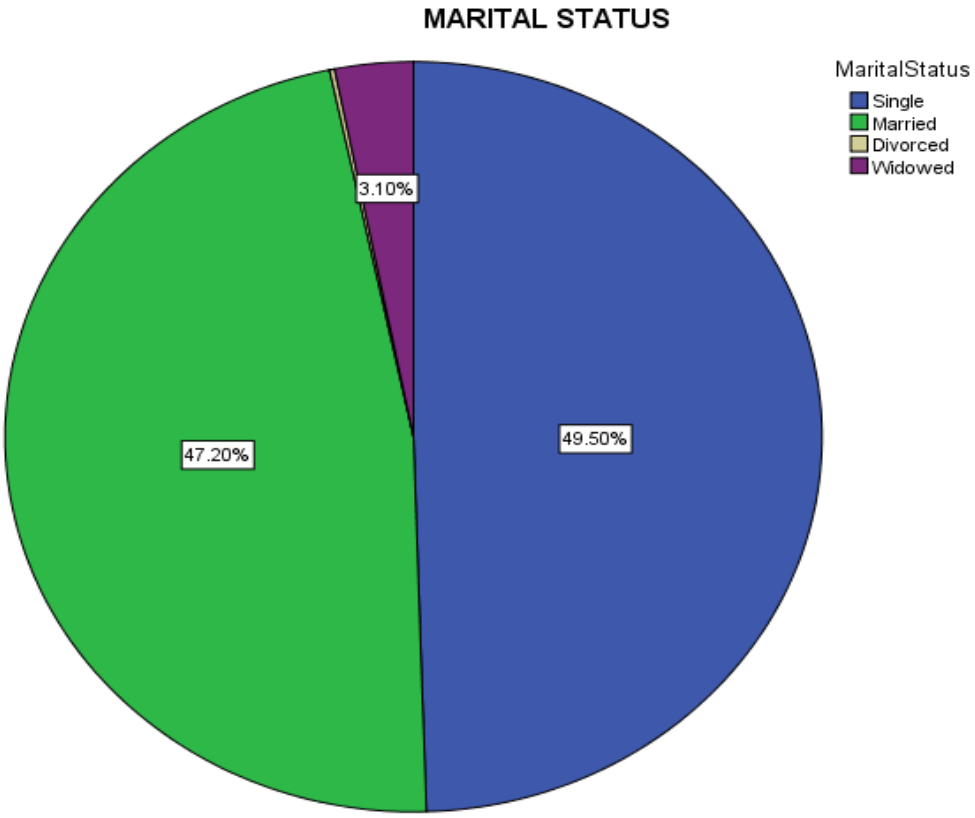


Figure 4. 26 Marital Status of Local Community

4.7.4 Educational Conditions

Around 55% the people in local community attained primary level education. Only 2.4% of the local people are graduated. About 28.8% remaining are middle and high school levels. About 12.7% of local population responded that they cannot read or write.

Table 4. 23 Educational Attainment Levels of Local Community

Sr.	Educational Attainment	Frequency	Percent
1	No education	127	12.7
2	Primary	550	55.0
3	Middle	217	21.7
4	High	71	7.1
5	University	11	1.1
6	Graduated	23	2.3
7	Post Graduate	1	0.1
Total		1000	100.0

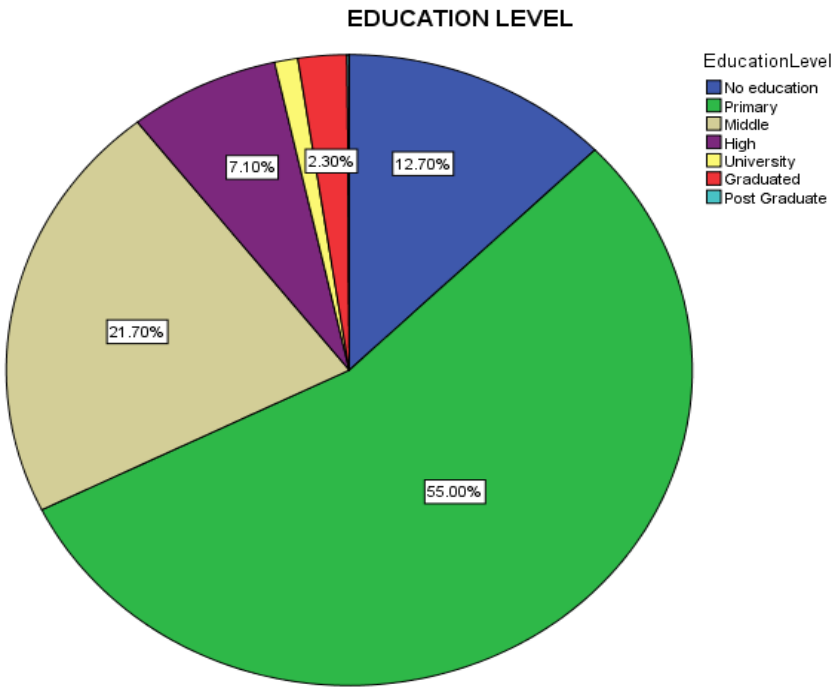


Figure 4. 27 Educational Attainment

4.7.5 Industry of Employment

About 45.8% of local population is dependent and full time schooling. Manual labour is the most conspicuous living with about 22.9%of the people in the local area is working. Second most dominant type of retail trade with about 16.3% of population. Approximately 5.3% of the people in the resident area is working in fishery in Taung Thaman Lake. It could be seen that fishing in Taung Thaman Lake is the third most prominent type of employment for local community and the project has to consider not to harm their livelihood.

Table 4. 24 Employment of Local Community

Sr.	Industry of Employment	Frequency	Percent %
1	Dependent	260	26.0
2	General Worker	229	22.9
3	Student	198	19.8
4	Retail Trade	163	16.3
5	Fisherman	53	5.3
6	Agriculture	38	3.8
7	Employee (Private)	25	2.5
8	Livestock	18	1.8
9	Employee (Government)	16	1.6
Total		1000	100.0

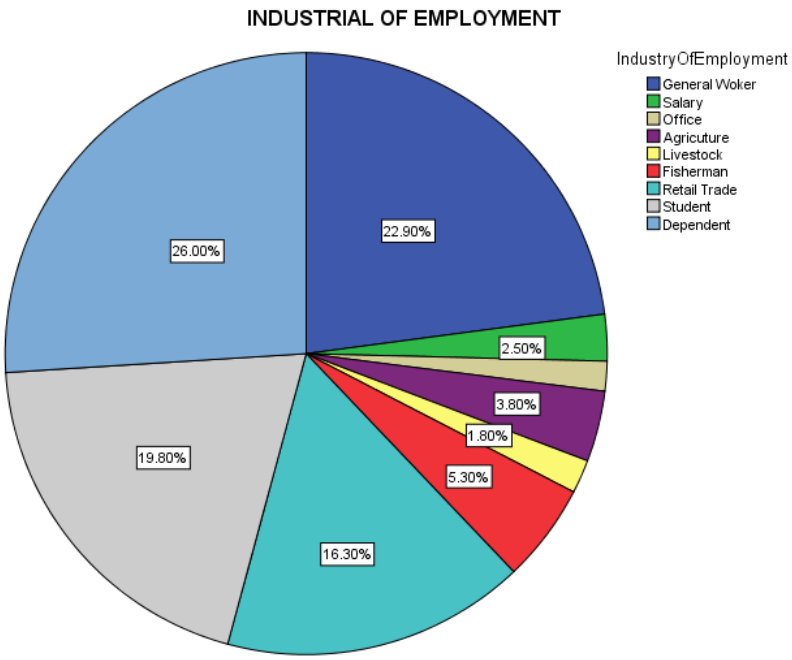


Figure 4. 28 Industry of Employment

4.8 Cultural Heritage

Cultural Heritage Impact Assessment (CHIA) has been carried out for Taung Thaman Lake Resort Project as part of the Environmental Impact Assessment (EIA). The project is situated on the southeast bank of Taung Thaman Lake, adjacent to the U Bein Bridge on the north. The project occupies a lot area of about 40.27 acres and the building types will include shop houses, low-rise commercial buildings, hotel, banquet halls and a conference center.

4.8.1 Aims and Objective of the Cultural Heritage Impact Assessment

The purpose of CHIA is to identify possible archaeological, cultural and historical evidences within and near the Study Area, to evaluate the potential impacts of the proposed development area on archaeological, cultural and historical resources during construction and implementation phases. This includes negative and positive impacts and those that are direct, indirect, cumulative and residual after carrying out any proposed mitigation measures.

This CHIA's objectives are:

- to safeguard the integrity of heritage resources in the face of threats from development,
- to present the legal and regulatory framework for heritage conservation and for dealing with heritage in the CHIA context;
- To identify and record heritage resources within the development, highlighting heritage of critical significance and value;
- To recommend a range of possible mitigation measures to deal with unavoidable negative impacts on heritage resources.

4.8.2 Geographical Scope of the Study Area

The CHIA addresses potential impacts on cultural heritage on the the construction shop houses, low-rise commercial buildings, hotel, banquet halls and a conference center (the whole project) for the proposed Taung Thaman Lake Resort project.

Figure 4. 29 Location of Taung Thaman Lake Resort Project Site

Table 4. 25 Assume Heritage by UNESCO

Built Heritage	Archaeology
Temples	Burials
Pagodas	Palaces
Monasteries	Foundations
Shrines	Kilns
Colonial buildings	Manufacturing sites
Decorative elements/architectural styles	Agricultural evidence
Pathways Cultural landscapes	Daily life items
	Water management

4.8.3 Scope of Cultural Heritage Resources

The CHIA addresses potential impacts to the following heritage resources within the geographical scope defined above;

- Standing and potential buried archaeological remains of settlements, cemetery, and other features
- Cultural resource including traditional terracing and agricultural patterns, paths and routes, tombs
- Historical buildings

4.8.4 The CHIA Methodology

4.8.4.1 Task 1. Baseline data collection

Baseline study shall be conducted to compile a comprehensive inventory of heritage sites within the proposed project area, which include:

(i) all declared monuments;

(ii) all proposed monuments;

(iii) all buildings/ structures/ sites graded or proposed to be graded by

Ministry of Culture (MOC)

(iv) Government historic sites identified by MOC

(a) Desk-based study

Desk-based study was carried out to determine physical and cultural baseline conditions and to assess the potential for cultural heritage resources to be present in the Study Area. Desk-based study included information gathered from the following sources:

- Research Report, Term, Books and articles on relevant historical, archaeological and other cultural studies
- Historical maps, photographs and illustrations
- Cartographic sources including maps and satellite imagery

(b) Preliminary scoping exercise

An initial site reconnaissance visit was conducted to preview the nature of the Study Area and to evaluate the types and numbers of heritage resources present and assessment.

(c) Field surveys

Preliminary scoping indicated that the following on site field surveys were needed to supplement the information required to carry out the CHIA:

- Rapid Assessment Survey of the U Bein Bridge, Taung Thaman Lake
- Preliminary Built Heritage Survey of religious structures that are situated in the surrounding of the proposed development site
- Traditional village setting
- Built Heritage
- Other heritage resources

4.8.4.2 Task 2. Identification of impacts on Cultural Heritage Resources

Impacts of the current project on the cultural heritage resources of the project area were identified to gauge the degree to which resources will be compromised. All identified heritage resources were assessed in relation to the proposed Taung Thaman Lake Resort Project including engineering works and temporary work areas.

4.8.4.3 Task 3. Assessment of Impacts on Cultural Heritage Resources

Potential impacts on heritage resources from Taung Thaman Lake Resort Project and from its operation were assessed.

4.8.4.4 Task 4. Recommendation of Mitigation Measures

The CHIA details the various options for actions or programs to mitigate unavoidable impacts that will result from Taung Thaman Lake Resort project and to maintain or improve the level of heritage resources.

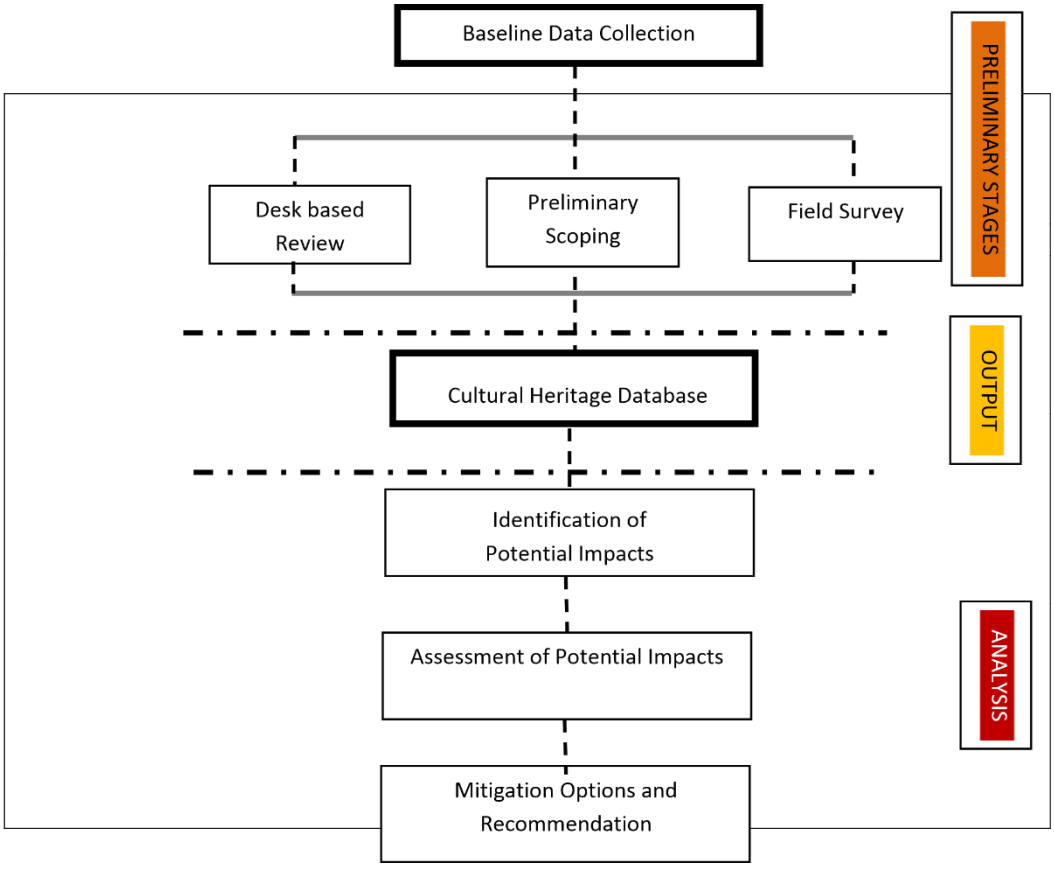


Figure 4. 30 Methodology of CHIA

4.8.5 Legislation and Guidelines

The following documents supply the legal framework and guidelines for the implementation of the CHIA by Protection and Preservation of Cultural Heritage Region Law. (State Peace and Development Council, 1998)

4.8.5.1 Current National Heritage Legislation

The 1957 Antiquities Act of Myanmar acknowledges the protection of place of worship. "The Protection and Preservation of Cultural Heritage Regions Law of Myanmar (1998)", changes the term "antiquities" as in "Antiquities Act of Myanmar(1957)", which refers only to places and objects with archaeological interests, to "cultural heritage" which is "to be protected and preserved by reason of its historical, cultural, artistic or anthropological value" for places existed before 1886. "The Law Amending the Protection and Preservation of Cultural Heritage Regions Law (2009)" has changed the timeframe to 100 years old. "The Protection and Preservation of Cultural Heritage Regions Law of Myanmar (1998)", is limited to ancient monuments and sites, and absolutely not on intangible cultural heritage. For natural areas, only caves, pond and natural landscape surrounding ancient monuments are mentioned. According to this Law, as of 1999 all nationally-declared Cultural Heritage Regions are each to be registered and demarcated into three protection zones: Ancient Monumental Zone (MZ), Ancient Site Zone (AZ), and Protected and Preserved Zone (PZ).

4.8.5.2 National Heritage Resources Act

General provisions for the cultural heritage region and the ancient monumental zone in the Act are as follows:

- The building existed before last 100 years.
- The building has existed together with the architectural structure & artistic works. • Process of excavation is made as Ancient Site.
- Existing without disturb the surrounding and living hood precinct of 90 feet's from the building.
- The building can be carries out the works of renovation & maintenance for archaeology.
- The building which be essential for the reasons of its historical.

General provisions for Ancient Site Zone in the Act are as follows:

- Existing one or more ancient monument.
- Site where the ancient things be founded from above and of the ground. • Site where the process of excavation is made.
- Site where the supporting evidences of archaeology have been founded.
- Site where archaeological preservation and maintenance has been made.
- Existing without disturb the surrounding and living-hood extend till 90 feet's.

(Example: farmland, paddy land, dwellings)

General Provisions for Protected and Preserved Zone in the Act are as follows:

- Within such zone, where an ancient monumental zone or an ancient site zone is situated.
- Within such boundary, where supporting evidences of archaeology have been founded.
- Within such zone, the need to protect and preserve the ancient monument, ancient site and view of the cultural heritage in order that they may not be destroyed.

Criteria for Identifying Elements of Cultural Heritage and Heritage Conservation Areas in the Act are as follows:

(a) Cultural Heritage

- Ancient monument or ancient site which is required to be protected and preserved by reason of its historical, cultural, artistic or anthropological value.

(b) Ancient Monument

- That have existed before last 100 years or that have been determined as cultural heritage
- Architectural structure, shrine, stupa, temple, monastery, palace residential building and carving, image and painting thereon
- Natural or manmade cave in which human beings had dwelt
- Stone inscription and record
- Road, bridge, sepulcher, sepulchral site and remains of excavated structure Pond, city-wall, gateway, moat, fort and any remains thereof;

(c) Precinct of ancient monument

- The enclosure of an ancient monument

4.8.5.3 Myanmar National Building Code

Building codes which form part and parcel of Rangoon Municipal Act of 1922, which is still in force, required that a person must obtain a permit from the Engineering Department (Buildings) of city development committees to construct any kind of building in Yangon. If the building is completed, permission to occupy it must be obtained from the same department. Moreover, the 'Myanmar National Building Code Development Planning' Project was signed between UN-habitat and national professional body, Myanmar Engineering Society (MES) in 2011. This project is endorsed by the Ministry of Construction, Department of Human Settlements and Housing Development. There are altogether seven Technical Working Groups and in Technical Working Group II Architecture and Urban Design, there is a chapter

"Regulations for Historical buildings" which is now using as a provisional one. (Myanmar National Building Code Chapter, 2013)

4.8.6 Definitions

Terms which are used frequently throughout this document are defined in order to ensure clarity; the definitions are taken from authoritative sources. In this CHIA cultural heritage is considered to be Physical Cultural Resources as defined below.

(a) Physical Cultural Resources

"Movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic or other cultural significance. Physical cultural resources may be located in urban or rural settings, and may be above or below ground or under water. Their cultural interest may be at the local, provincial or national level or within the international community". (Asian Development Bank 2003, Environmental Assessment Guidelines)

(b) Baseline Data

"Data gathered during social and environmental assessment to describe the relevant existing conditions of the project, such as physical, biological and socio-economic conditions, including any changes before the project commences." (Asian Development Bank 2003, Environmental Assessment Guidelines)

(c) Impact Assessment

"Cultural Heritage Impact Assessment (CHIA) is defined as "a process of identifying, predicting, evaluating and communicating the probable effects of a current or proposed development policy or action on the cultural life, institutions and resources of communities, then integrating the findings and conclusions into the planning and decision making process, with a view to mitigating adverse impacts and enhancing positive outcomes." (International Network for Cultural Diversity – Cultural Impact Assessment Project)

4.8.7 Historical Summary

Amarapura is one of Myanmar's former capitals and now a township of Mandalay. It was built by King Bodawpaya in 1783 and served as the centre of power until 1857, when the capital moved to Mandalay.

Amarapura is bounded by the Irrawaddy River in the west, Chanmyathazi Township in the north, and the ancient capital site of Ava (Inwa) in the south. It was the capital of Myanmar twice during the Konbaung period (1783–1821 and 1842–1859) before finally being supplanted

by Mandalay in 1859. It is historically referred to as Taungmyo (Southern City) in relation to Mandalay. The township is known today for its traditional silk and cotton weaving, and bronze casting. It is a popular tourist day-trip destination from Mandalay. There are also numerous stupas to be seen in this area, including the Kyauktawgyi Pagoda, as well as the Maha Gandhayon monastery.

The whole length of U Bein Bridge is 3967 feet or three quarter of a mile and it was built around 1850. It is used as an important passageway for the local people and has also become a tourist attraction and therefore a significant source of income for souvenir sellers. It is particularly busy during July and August when the lake is at its highest. The Ministry of Culture's Department of Archaeology, National Museum and Library plans to carry out repairs when plans for the work are finalized.

Figure 4. 31 Taung Thaman Lake Resort Project Plan

4.8.8 Heritage Listing

The development site identified in the Taung Thaman Waterfront Development Structure Plan includes the U Bein Bridge, which is listed on the State Registered of Heritage places. In addition there are a number of heritage places and structures that are adjacent to the waterfront site that could potentially be impacted upon by the proposed development. These places and structures, listed below, will be considered by this report.

Table 4. 26 Lists of Heritage Places and Structures at the Vicinity of the Project

Places	Listed/ Unlisted	Landuse Type	Location
Taung Thaman Lake	Listed	Water Management	Amarapura Township

U Bein Bridge	Listed	Pathways Cultural landscapes	Taung Thaman Lake
MAHASAKYA RAMSI Taung Thaman Kyauk Taw Gyi	Listed	Cultural	Taung Thaman Village
Pahtoe Daw Gyi Phaya (MAHAVIJAYARAMSI)	Listed	Cultural	Northern Part of Taung Thaman Lake
Aung Myay Dataw Phaya	Unlisted	Cultural	Taung Thaman Village
Shwe Moat Htaw Phaya	Unlisted	Cultural	Taung Thaman Village
Kan U Kyaung Monastery Compound	Unlisted	Cultural	Ywa Thit Village
Tae` Nan Thar Phaya	Unlisted	Cultural	Aye-Mya-Thar-Yar-Kyaung (Monastery Compound)

4.8.9 Site Description

The study area consists of Taung Thaman Lake that on the southeast bank has been occupied by the development site. The northern part of the study area is the historic U Bein Bridge that is crossing in the Taung Thaman Lake near Amarapura. To the northeast of the site is the Yadanapone Univeristy, one of the main Univeristy in Mandalay. The area consists of mostly of religious buildings, and includes cultural landscape, and public and private open spaces.

4.8.10 Water Bodies, Open Space and Cultural Landscape

4.8.10.1 Taung Thaman Lake and Environs

It has cultural heritage significance. Granddad was King Badon and he had chosen well the site of his capital namely as Amarapura (South Town). It was surrounded by lakes to lend a lush and green atmosphere in a dry hot land.The entire place presents a picture of green freshness and prosperity. The mass of water in the Lake Taung Thaman keeps the atmosphere cool and pleasant. It is said that Buddha himself had prophesied that this place is going to be a prosperous city where Buddhism flourished. King Badon made the prophesy true.

Amarapura's another name Taung Myo (The South Town) had been in use even in the time of Myawadi Wungyi because it is situated on the south of Mt. Mandalay. The South Town

and Taung Thaman Lake are so well associated that one had not seen the town if he had not visited the lake. Its beauty is of world fame. Visitors who came there portrayed its grandeur in words and pictures. Michael Symes who was there on 18 July 1795 said that he had been lucky to know beautiful spots in both Europe and Aisa but unexpectedly Taung Thaman's beauty almost took his breath away. It surpassed all others.

It is believed that the Buddha visited places where Buddhism would flourish later. In the course of these visits, the Buddha came to the Sagaing Hills. Ninetynine ogres came to listen the sermon of the Lord. With their request the Lord also visited the place of four other ogres living on the east of the river. They were Nga Taung Thaman, Nga Taung Myint, Nga Taung Kyinn and Nga Taung Pyone. After having received the food offered by them, the Lord prophecied that these four ogres would enentually became Kings in these localities where Buddhism flourished. These places will be named after them. Taung Thaman was one of these and Amarapura of course is the new name of Taung Thaman and its environ.

Taung Thaman Lake and its environs have a close association with historic builings that are highly valued by local people, and it is also tourist attraction place. There are five places of some historical interest and they are;

1. The Mahagandharama Monastic Establishment,
2. The Taung Min Gyi Image,
3. An Avenue of Meze (Madhuca longifolia) Trees,
4. U Bein Bridge
5. The KyaukTaw Gyi Image with the Temple above it. (Pin Nyar, Ko; Amarapura)

Figure 4. 32 Historic View from Taung Thaman Resort Project Site

Figure 4. 33 Historic Photograph from Taung Thaman Resort Project Site

4.8.10.2 U Pain Bridge (U Bein Bridge)

U Pain bridge has cultural heritage significance. It was in 1849 during the region of King Bagan (the Nineth King of Koung Baung Dynasty) that it was constructed.U Pain was clerking to Bai Sab the Myo Wun (Highest Officer in Charge of the City). During the raining season, the lake became full of water and except for boats the city was cut off from its hinterland that supplies the daily provisions. To save the situation a bridge was necessary to span it across from east to west.

Both Bai Sab and U Pain were of Islamic faith and they served King Bagan long before he became king. They found that it was best to serve their master by having this bridge constructed and they easily got the king's permission to do so. This permission involved the right to pull down used timber from residential quarters used by members of the Royal Family and officers of the king at times when Amarapura was not made the capital city. There was a suggestion that such timber should be more usefully employed in building monasteries. U Pain supervised the construction and it took two years to complete it.

The bridge is not straight. Coming out from east bank it goes somewhat in south west direction and whenit comes to about the middle it turns northwest. It is believed that in this way it could stand well against the wind from the south in the season of rains. The posts were pointed at one end and driven seven feets into the lake-bed. Close to the ground two corss-beams were fixed to each post to prevent it from further sinking. Three layers of planks were laid on the floor and railings were fixed on each side of the floor all along the bridge. There were altogether 984 posts. At each end of the bridge there were brick platforms and steps. Later these brick works were replaced by wooden ones. Then four rest houses were built at some intervals along the bridge.

In this way more posts were used and the grand total of posts became 1086. At nine points a sort of draw-bridges were made in order to allow royal barges and war boats could get across the bridge. There are 482 spans and the wholelength of the bridge is 3967 feet or three quarter of a mile.

A year after the Second World War there was a big flood that the whole bridge was submerged under water. That caused a few spans of the bridge destroyed. U Ba Si, a native of Taung Thaman and a representative of the house of Deputies repaired it after the flood. Another big flood came again in 1973. This time the Presiding Monk of the Mahagandharama (U Zanakabiwuntha) and the Township people Council repaired it.

It is highly valued by the local community as an important passageway and it has also become a tourist attraction as a garden.

4.8.11 Built Heritage

Built heritage is one of the most important cultural assets. It represents the historical layers of built environment in places made of brick, plaster, wood, metal and stone. Built heritage includes monastery, factories, houses, hotels, museum, markets, fences and cemeteries, etc. It includes areas, precincts and streetscapes.

In the study area, religious buildings such as stupa, temple, and monastery are historic buildings and they all have cultural heritage significance by the historical, social, aesthetic, architectural and archaeological value.

4.8.11.1 Taung Thaman Kyauk Taw Gyi (MAHASAKYA RAMSI)

It was King Sagaing (1819-37) popularly called Bagyidaw who ordered a great stone image sculptures. The King took great interest in art and he supervised the makig of a great bronze image called Thetkya Thiha to AVA (Innwa). It is sixteen and a half feet high and finished in 1824.

On 2 November 1846, Bagan King decided to have a better building for the Mahathetkya Yanthi Image. A site on the west of the place where the British Envoy put up in 1795 was selected. For the new temple the Nanda (Called Anada) of Bagan was the model. The construction began on 26 April 1849. The temple is constructed on a square platform with each side measuring 133 feet 6 inches. It is 118 feet 6 inches tall. The construction took well over a year and the temple was finished early in October 1850. The finial (11 feet 9 inches high) was ceremonially raised and fixed on 29 October 1850. The Stone inscription of this record is still in existence.

In this historic site, the whole complex is well planned with various effects. Viewed from surrounding of Taung Thaman Lake and the vicinity of Amarapura Town, the whole is a landmark on the Taung Thaman Lake and contributes to the community's sense as a place of recreation. And then the supremacy of stupa can be seen from the visual accessibility axis. The whole complex is in harmony and unity with respect to the distance and height. And then, all structures within the whole complex are created by making good space utilization and form composition.

Figure 4. 34 Taung Thaman Kyauk Taw Gyi Temple (MAHASAKYA RAMSI)

4.8.11.2 Pahto Taw Gyi Pagoda (MAHA VIJAYA RAMSI)

It was built in 1819 by King Badon (Bodawpaya) when he was successed by his grandson King Sagaing on 7 June 1819. It is located to the north of Taung Thaman Lake in Amarapura Town.

One-night people reported that they saw at about 3000 yards from the palace on the south west a bright light shining on the horizon. The king investigated and found the light was hovering on the site of the monastery built by his father the Crown Prince Siri

Mahadhannabhidaja Sihasura and his mother. The late king, Bodawpaya wanted to build a pagoda on this site. He decided to carry out the wish of his grandfather and he said that he would prefer building one like the Mahaceti of Srilanka.

An order was passed on 5 January 1820 to prepare the site for the Zigon Daw Gyi Mahaceti. Silver weighing 185,200 viss was issued for all expenses of construction including wages. The king accompanied by the Chief Queen laid the foundation on 2 March 1820. On the night of the following day there was a lunar eclipse and the relic chamber was closed precisely at the time when the eclipse started. After that the kig went daily to the site for supervision.

In this historic site, the whole complex is well planned with various effects. It has a high aesthetic value and it is highly valued by the local community as a community space. Viewed from surrounding of Taung Thaman Lake and the vicinity of Amarapura Town, the whole is a landmark and the supremacy of stupa can be seen from the visual accessibility axis. The whole complex is in harmony and unity with respect to the distance and height. And then the whole composition is dominant on the environment due to its massive form and height.

Figure 4. 35 View of U Bein Bridge and Pahtotawgyi Phaya

Figure 4. 36 Entrance Gate of MAHA VIJAYA RAMSI Pahtodawgyi Pagoda

*4.8.11.3 **Other Places of Interest***

The following religious buildings inn Nwa-Noet-Su Village, Ywathit Village and Taung Thaman Village that are located within 1.5 kilo meter of the proposed development are considered as a cultural heritage and all are historc buildings according to the interview data by local people. But those recorded to date are in poor condition and at risk of loss. And also these are not nationally designated sites but there are highly valued by local community as a cultural significant.

Figure 4. 37 Tae Nan Thar Phaya Closed to the Proposed Development Site

Figure 4. 38 Ywa Thit Kan U Kyaung Phaya

Figure 4. 39 Aung Myay Dattaw Phaya

Figure 4. 40 Shwe Moat Htaw Phaya

The designated and the proposed heritage structure/ historic religious building in national level or local level would be directly impacted by the construction of Taung Thaman Lake Resort Project. The impacts are more complex than commonly presented, ranging from very

indirect to fluctuating, direct and total. With the rigorous application of mitigation measures, it could be possible to limit but not eliminate physical destruction from engineering works. There will be some residual impacts which no amount of mitigation will eliminate and an inevitable loss of some heritage could occur by the development.

CHIA of Taung Thaman Lake Resort project highlights invaluable heritage resources. It will also bring radical economic change to local communities. Emphasis should be placed on developing a program to ensure protection of the heritage resources linked to bringing socio-economic benefits for the local communities.