M.O.G.E.

MPRL E&P

Environmental Monitoring Report

April ~ September 2020

for Redevelopment and Enhanced Oil Recovery (EOR) Programme

MPRL E&P Pte Ltd.

Contents

Acronym	Definition
ALARM	Advancing Life and Regenerating Motherland
ALARP	As Low As Reasonably Practicable
ASRs	Air Sensitive Receivers
BMI	Body Mass Index
CSR	Corporate Social Responsibility
EIA	Environmental Impact Assessment
ECC	Environmental Compliance Certificate
ECD	Environmental Conservation Department
EMP	Environmental Management Plan
EOR	Enhanced Oil Recovery
FOM	Field Operations Manager
GAP	Good Agriculture Practice
GOCS	Gas and Oil Collection Station
WBG	World Bank Group
WHO	World Health Organization
IFC	International Finance Corporation
JSA	Job Safety Analysis
KAP	Knowledge, Attitude and Practice
LPG	Liquefied Petroleum Gas
NEQEG	National Environmental Quality Emission Guideline
NSRs	Noise Sensitive Receivers
OGM	Operational Grievance Mechanism
PME	Powered Mechanical Equipment
RTA	Road Traffic Accident
SOP	Standard Operating Procedure
UN	United Nations
VDC	Village Development Committee
NDWG	National Drinking Water Guideline
EPA	United States Environmental Protection Agency

1.0 Executive Summary

MPRL E&P is a leader in the upstream energy sector in both the onshore and offshore regions of Myanmar. Since establishment in 1996, MPRL E&P has amassed over a decade of experience and a solid proven track record within the oil and gas sector.

At MPRL E&P we conduct business to the highest standards of ethics, legitimacy and transparency, guided by a clear sense of social and environmental responsibility. We believe the growth of our organization is dependent on the empowerment of our employees. We strive to develop a thriving environment ensuring employees become involved in a process of continuous improvement.

This third environmental monitoring report covers the activities and progress of the performance of environmental implementation and monitoring during the six months from April 2020 to September 2020. It includes all the data from the monitoring activities, the progress of the environmental measures in accordance with the Environmental Management Plan (EMP), and corrected actions based on comments from ECD, and challenges in actual operations. EMP together with its eight sub plans are implemented as per schedule.

During the second monitoring survey, most of the air quality parameters are well within the NEQEG guidelines, however, it was noted that the value of **$PM_{2.5}$** and **SO_2** are slightly higher than the National Environmental Quality (Emission) Guidelines in some locations. It was noted that high **$PM_{2.5}$** and **SO_2** locations are outside of main MPRL E&P's operational area and close to a densely populated area. As such and based on the advice from MPRL E&P's post-survey review meeting with Magway ECD, while conducting the third environmental monitoring survey, we measured ambient air quality and noise level with a detailed logbook to record the human activities such as vehicles, motorbikes usage, etc., at the monitoring stations, especially in densely populated areas. The measured air ambient quality data indicated that the data quality was not only impacted by the number of vehicles and motorbikes but also cooking, burning rubbish, leaves and weather condition. Based on the observation during the third survey, all human activities such as business activities, road construction, restriction of vehicles travelling and motorbikes usages were decreasing compare to the second survey probably due to COVID-19 pandemic. As a result:

1. The parameters of the Ambience Air Quality monitoring results are under the National Environmental Quality (Emission) Guideline (NEQEG) in the third survey, however, Noise parameters exceed in two monitoring points at night time, Z1AQN in Pwint Phyu Township and Z2AQN in Kyauk San Village. Our studies indicated that high noise data are due to the usage of motorbikes and loudspeakers, especially in the night time of the village community areas during the survey period.
2. The field operations still maintain the achievement of zero discharged of produced water since 24 August 2017.
3. Mostly all of the parameters can measure as per commitment in the EIA report except Uranium which was not available to measure in the labs within our country, Myanmar. We will measure that parameter as soon as the lab is capable to test with their facilities in Country.

Reflecting from our mid-year point, we had a challenging start to our new fiscal year 2020-2021 due to the strong operating environment headwinds caused by the COVID-19 pandemic at the beginning of the year. Regardless, we completed the third monitoring survey with no delay as we committed in the ECC. For our community in Mann Field, it means protecting themselves and working alongside us to make their life better.

Our contributions to the society come in many forms as a socially responsible business, from providing energy which drives our economy and raises our living standards to engaging and supporting community in our operations areas. In our commitment to create long-term shared value for our community in Mann Field, we are aspired to achieve the highest level of social performance which entails building a robust relationship with our host community, understanding their priorities, addressing their concerns and investing in their collective needs.

Furthermore, we strive to align our CSR efforts with the global sustainable development agenda, known as the United Nations Sustainable Development Goals (SDGs) which are a set of interrelated goals seeking to tackle the major challenges facing our society while ensuring a sustainable and prosperous future for next generation.

Our social investment strategy prioritizes the areas where we believe our investments will have the biggest potential to multiply our impact and achieve sustainable results for the 14 community living near our operations in Mann Field. Our social investment themes have been:

- Community infrastructure
- Education, sanitation and basic health
- Livelihood development and economic empowerment
- Capacity building and partnerships
- Critical human needs and disaster response

In this regard, we continue to apply the community-led approach to our community initiatives in Mann Field in order promote inclusive and participatory decision-making, transparent and accountable village development, and strengthen grassroots level governance capacity.

As a key achievement in strengthening community capacity, we are entering a new phase of community livelihood development initiatives as we move from providing inputs to farming community in Mann Field towards helping them set up a platform that will facilitate the process of the development of their agribusiness.

We have suspended our Mobile Clinic Program in Mann Field since the month of April to this mid-year point due to the coronavirus pandemic. Instead, we carried out awareness raising activities on COVID-19 together with the Department of Public Health (Minbu), and supported medical supplies including non-contact digital laser infrared thermometers, face masks, PPEs and hand sanitizers to the community health centers and the Minbu General Hospital as part of our donative drive for COVID-19. In order to reduce the risk of infection in Mann Field, we conducted community meetings

and information sessions in a manner that was in compliance with the COVID-19 guidelines by the Ministry of Health and Sports (MoHS).

In this fiscal year, MPRL E&P will mainly focus on improving agricultural and livestock productivity in order to strengthen livelihood development and economic empowerment among our community households who engage in small-scale agriculture and livestock breeding. We will also work on further building up community capacity, especially supporting youth's vocational skills development through our partnership with local and regional vocational and educational organizations. In this regard, our objectives have been to improve liveability and economic prospects of our host community in Mann Field through our collaboration with MOGE (Mann Field), local and regional organizations including government departments such as Department of Agriculture, Department of Health, and Livestock Breeding and Veterinary Department.

At the department level, we are working to achieve the following goals which are ultimately tied to a set of Corporate Goals with regard to our Mann Field asset:

- Maintain a social license to operate from all key project stakeholders including community and regional government.
- Meet all legal requirements in compliance with the Myanmar EIA Procedures in Mann Field.
- Proactively build on our brand as a leading Myanmar national led upstream energy company to ensure both the government and general public are informed about the value we create as a business.

For the first six months of this fiscal year, we received a total of 11 OGM cases from Ma Kyee Chaung Quarter, Mei Bayt Kone Village, Chin Taung Village, Aye Mya Village, Lay Eain Tan Village. The cases have been handled by the CSR Field Coordinator in cooperation with the Field Operations Team and MOGE Departments. All met with the OGM performance indicators. Since September 2014, MPRL E&P's OGM in Mann Field, which is the first such mechanism to be implemented at an onshore operating field in accordance with the UN Guiding Principles on Business and Human Rights, has solved a total of 127 community grievances. The OGM Progress Reports were prepared and uploaded on our website on a quarterly basis to transparently communicate the mechanism's performance.

2.0 Project Description and Production information

The Mann Field, discovered in 1970 by MOGE, Currently includes **674** wells of which **327** were producing as of September 2020 while the remaining wells were shut-in. The total produced oil and associated gas from the Production Enhancement Project is **14.9** MMbbls, including **9.25** MMbbls above the normal decline curve, and **16.9** Bcf gas as of September 2020.

2.1 Mann Field Operation Status

Under the PCC, MPRL E&P is undertaking a re-development operations activity of the Mann Field to improve the environmental performance of the operations.

The operation activity includes:

Infill well drillings – due to current decline of the field, MOGE and MPRL E&P have been drilling infill wells in main Mann Field areas close to currently producing wells and outside of surrounding communities, however no infill well activity during the last six months.

Deepening Wells – to deepen tens to hundreds of foot from existing well bore by drilling, no activity of deepening well during the six months.

Chemical Treatment - to ensure that oil is maximized from the reservoir by using small amount of chemical such as paraffin dispersant, paraffin inhibitor, and non-chemical GreenZyme.

Remedial and work over operations – maintain oil production by servicing such as swabbing and bailing of producing wells;

Improvement of Pumping Unit – pumping units will be / have been repaired to reduce the likelihood of spills to the surrounding areas.

Refurbishments of the Gas and Oil Collecting Stations (GOCS), Flow Pipes and Drain Pits – to ensure health and safety to surrounding communities and reduce the risk of spills.

Rehabilitation of Shut-in Wells – sealing off shut-in wells to avoid contamination of surrounding and restoring surrounding areas to resemble original state.

Re-perforations will be undertaken for better control of the well.

Development of Produced Water Management System – produced water will be injected into shut in wells.

2.2 Current Operations Summary

2.2.1 Remedial and work over operations within six months

(April 2020 to September 2020)

No.	Service	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Total
		Frequency of Activities						
1	Additional Perforation				1			1
2	Bailing & Change Tubing	3	6		4	5	3	21
3	Change Tubing		2		1			3
4	Check BHA & Change Tubing			4		3	2	9
5	Check Sucker Rod String			1				1
6	Change Tubing & Lower Down PSD					1		1
7	Drill Out BP				2			2
9	Fishing & Bailing	1						1
10	Fishing & Drill out BP	1						1
11	Fishing & Pump Service	1		2		1		4
12	Lower Down PSD & Pump Service		1	1				2
13	Pump Service	16	17	13	16	14	9	85
14	Pump Test	1	1					2
15	Raise up PSD & Pump Service		1				1	2
16	Recover BHA	1		1	4	3		9
17	Recover Sucker Rod String			1				1
18	Reopen				3			3
19	Reposition PKR & Pump Service		1	1	1		1	4
20	Re-space out Pump & Bump Valve		4	1	1	2	3	11
21	Scraping & Bailing	9	7	4	5	7	6	38
22	Scraping, Swabbing & Bailing				2		2	4
23	Scraping, Swabbing, Bailing & Change Tubing	6	6	7	6	5	7	37
24	Zone Combination	1			1			2
25	Zone Isolation			1	2			3
	Total Serviced Wells (Monthly)	**40**	**46**	**37**	**49**	**41**	**34**	**247**

Figure. 1: Remedial and work over operations activities

2.2.2 Mobile Power Generator Register Lists in Mann Field

No.	Unit Name	Engine type	Generated Power	Quantity
1	P-100	3408 CAT	365 HP	1
2	P-82	3306 CAT	270 HP	1
3	P-75	Cummins N855-P235	235 HP	1
4	P-70	Cummins N855-P250	250 HP	1
5	P-69	Cummins N855-P250	250 HP	1
6	P-65	Detroit 6V71	260 HP	1
7	Tractor		50 HP	4
8	35T mobile crane	Nissan RD8	365 HP	1
9	Loader	CAT	85 HP	1
10	Forklift	CAT	160 HP	1
11	Wheel Loader	CAT	200 HP	1
12	Grader	CAT	200 HP	1
13	Bull Dozer	CAT	275 HP	1
14	Circulation Mud Pump	CAT	350 HP	1
15	OPI Mud Pump	Detroit	365 HP	1
16	Main Mud Pump	Detroit	439 HP	1
17	King Power Swivel	CAT	173 HP	1
18	Power Pack	F6L912	63 HP	2
19	Welding Machine	Deutz	25 HP	2
20	Compressor	CAT	85 HP	1
21	Vehicle			30

Figure. 2: Mobile Power Generator Register Lists

Note; P 100 is idle most of the time due to short hands of crew during pandemic period, P 65 is idle due to be standing by at the north of Mann Creek because of restriction load of truck to cross the bridge.

3.0 Environmental Management Organization

MPRL E&P is committed to providing resources essential to the implementation and control of the EMP. Resources include the appropriate human resources and specialized skills. The structure for the organization responsible for environmental management and implementation of the EMP is depicted in Table 1.0.

Table 1.0: Environmental Management Organization Roles and Responsibilities

Position	Responsibility
MPRL E&P	
General Manager	Oversee and coordinate all activities pertaining to the Project; ultimately responsible for environmental issues. Ensure delivery by the asset of its environmental, and operational targets. Ensure effective communication with all stakeholders.
Field Operations Manager	Technical aspects of the Project including contractor supervision during operations. Responsible for the execution of the Emergency Response Plan including the Oil Spill Contingency Plan.
Construction Manager	Technical aspects of the Project including subcontractor supervision during Project implementation.
HSE Officer (HSE Coordinator)	Ensuring that the Project and subcontractors operate in accordance with applicable regulatory environmental requirements and plans. Monitor implementation of environmental protection measures, and assist with technical input into oil spill response requirements.
Environmental Officer	Responsible for the implementation of EMP and ensure that environmental regulatory requirements are met with the National Environmental Quality Emission Guideline (NEQEG). Monitor implementation of environmental protection measures. Ensure environmental monitoring and inspections/audits are undertaken as per the requirements of the EMP.
CSR Field Coordinator (Community Liaison Officer)	Liaise with local communities, farmers and government regulators on the Project's behalf. Implement environmental awareness and education programmes with communities.
HSE Manager	Ensure that environmental regulatory requirements are met and that EMP requirements are properly implemented.

The Field Operations Manager has control over strategic project aspects and interaction with subcontractor staff where project activities take place.

The HSE Officer is monitoring the implementation of health, Safety and Environmental protection measures, including tracking, inspection, reporting and assisting with technical input into emergency response procedures and implementing as per the EMP.

The Environmental Officer is responsible for implementing the EMP and supervising contractors during the monitoring activities in the operations and preparing for the environmental monitoring report.

CSR Field Coordinator whose role is the continuation of liaisons with the local community.

HSE Manager is to ensure that environmental regulatory requirements are met and that EMP requirements are properly implemented.

4.0 Environmental Management Plan

The Environmental Management Plan (EMP) is to ensure full compliance with the Project's policies and with mitigation, monitoring and other commitments made in the EIA Report. While the EMP was treated as a high-level framework document, it was linked to several detailed management plans as described below which were developed to lay out the specifications for compliance with specific environmental elements.

These management plans mention in detail the management and mitigation measures required to be implemented, the time frame and responsibilities for their implementation, detailed training requirements, inspections/audits to check implementation, and reporting requirements in the EIA report. These management plans are presented below with details mentioned in the EIA report. MPRL E&P is implementing and monitoring as per the schedule planned.

- Waste Management Plan
- Emergency Response Plan
- Spill Response Plan
- Fire Risk Management Plan
- MEDEVAC Procedures
- Health and Hygiene Management Plan
- Transportation Management Procedures
- Environmental Monitoring Plan

4.1 Waste Management Plan

Figure. 3: Waste Management Flow Chart

The objectives of the Waste Management Plan are to:

- Ensure waste is managed in a controlled and environmentally sound manner;
- Comply with all statutory and contractual requirements concerning the management of waste;
- Ensure resources are recovered where possible and safe to do so, for re-use and recycling; and
- Ensure appropriate recording and tracking for all waste generated.

The WMP has been implemented during the operation phases. Waste streams are divided into four categories:

- Hazardous recyclable;
- Hazardous non-recyclable;
- Non-hazardous recyclable; and
- Non-hazardous non-recyclable.

The key steps in the waste management process are:

- Waste is segregated into hazardous, general and recyclable waste within suitable bins that are clearly labelled;
- Bins/drums are sent to approve disposal location. Each bin/drum is labelled with the waste type clearly written;
- Each waste bin/drum sent is included on the backload manifest; and
- Waste transportation is recorded in the waste database

4.1.1 Waste Implementation and Action Progress

Figure. 4: Waste Management Compound

4.1.2 Existing Solid Waste System

The solid waste management system in MPRL E&P mainly includes waste collection, segregation, and recycling continues to play a minimal role at present. 3Rs (reduce, reuse and recycle) were developed.

In Mann Field, waste segregation was implemented involving sorting and separating waste on the basis of its characteristics. Waste materials were segregated at source by providing colored and marked (with universal symbols and writing in English and Burmese) bins for storing waste as follows:

- Green – General Waste
- Yellow – Recycle Waste
- Red – Hazardous Waste
- Black – Non-Hazardous Waste
- Blue – Paper

Bins were placed in all GOCS, offices, warehouses, workshops, construction sites, base camp, and clinics. No waste collection bin would be allowed to overflow before it is emptied, and waste storage receptacles would be replaced promptly, in the event of damage. A sufficient number of bins were placed for each type of waste at waste collection points, depending on the variety and quantity of the waste expected from the location.

Waste of any description will not be stored permanently or for prolonged periods of time at the Waste Management Compound. The following procedures have been applied to the temporary storage arrangements for all waste:

- The waste are properly stored in the designated area and separated from other materials/substance storage.
- The facilities are clearly identified with each Identified area (like: Recycle Area; Hazardous Area...).

4.1.3 Solid Waste Management in MPRL E&P

The management of waste is a key component in a business. All the waste produced is recorded. MPRL E&P is monitoring and implementing compliance with the National Emission Quality Guideline and industry best practices.

According to our within 6-month self-monitoring records, from April 2020 to September 2020, the composting process is produced about 520 Kg. This process is very fast in the summer but in the rainy season the composting bacteria not work best under neutral conditions.

Figure 5: Composting Process

Figure 6: Composting waste used in Plantation Process at WCM

Recycling materials such as glass, paper and cardboard, plastics bottles, and metals, 2727 Kg are collected and sold out to the third party. Recycling materials are collected and separately from general waste.

Figure 7: Recycle Waste in WMC

General waste 4000 Kg collection from all area in the Mann Field operations during one year and temporary storage at Waste Management Compound. Field team managed cleaning and disposing the general waste by using Jambo bags and dispensed to designated area.

Figure 8: General Waste Storage in WMC

Waste Disposal Contractor Approval

No : MPRL / WDCA / 16

Date: 13-3-2020

Site name: WMC

1. The Company

Name : DOWA Shwe Taung Co., Ltd.

Address: Thilawa SEZ, Yangon

Transportation Equipment

Waste Treatment license no:

Driver Name: U Thaw Tar Tun

Driving License No.: E/000997/15

Helper 1 name: U Win Bo

Helper 2 name: —

ures

cy procedures? YES [✓] NO [ ]

ent? YES [✓] NO [ ]

YES [✓] NO [●]

YES [✓] NO [ ]

pot in case of emergency? YES [✓] NO [ ]

YES [ ] NO [✓]

YES [✓] NO [ ]

Total volume: About 5 tons (General waste)

Contractor representative

Name: U Thaw Tar Tun

Title: Driver

Signature:

Date/time: 13-3-2020

DOWA

GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD

Lot E1, Thilawa SEZ Zone A,

Yangon Region, Myanmar

Phone No & Fax No: (+95) 1 2309051

motivate our planet

Records and Other Supporting Documents	DOC NO:	GEM-OG-R004E/00
Subject: Disposal Certificate	Issued/Revised Date: 1 Oct 2018	Page 1 of 1

Date: 05 August, 2020

File No. GEM-REP-2020-216

To; MPRL E&P

Vantage Tower,623 Pyay Road, Kamayut Township,

Yangon, Myanmar.

DISPOSAL CERTIFICATE

This is to certify that we, the undersigned, disposed of the below mentioned Quantity as follows.

Quantity: General Waste – 4.62 Ton

Date of disposal: 14 March 2020

Place of disposal: GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD.

Lot No. E1 , Thilawa SEZ Zone A, Yangon Region, the Union of Myanmar

Disposal method: Landfilling Process

Disposal Company Name:	GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD.
Address:	Lot No. E1, Thilawa SEZ Zone A, Yangon Region, the Union of Myanmar
Telephone:	01-2309051
Fax:	01-2309051
Person in charge (Full Name):	Hideki Yomo
Signature:	

Disposal Company chop:

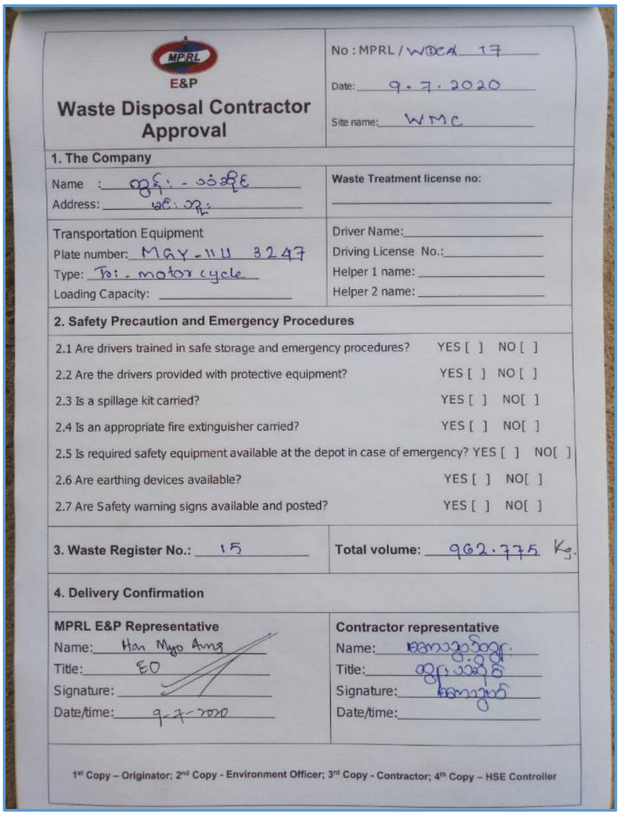
Any fraudulent statement may result in prosecution.

Figure 9: Cleaned and dispensed to designated area

The Waste have been re-selected, packed and stored at the Waste Recycle storage area. Recycle waste is disposed of by an approved third party.

Recycle waste have registered using the “Waste Register” form including specific details as to the type and quantity of waste.

Recycle Waste which is going to be sent to a selected third party for adequate disposal have to be monitored using the “Waste Disposal Contractor Approval” form which was approved by the Field Manager and / or site HSE Officer.


MPRL E&P

Waste Disposal Contractor Approval

No : MPRL / WDCA 17
Date: 9.7.2020
Site name: WMC

1. The Company
Name : [illegible]
Address: [illegible]
Waste Treatment license no:

Transportation Equipment
Plate number: MGY-1111 3247
Type: To: motor cycle
Loading Capacity:
Driver Name:
Driving License No.:
Helper 1 name:
Helper 2 name:

2. Safety Precaution and Emergency Procedures

2.1 Are drivers trained in safe storage and emergency procedures? YES [ ] NO [ ]
2.2 Are the drivers provided with protective equipment? YES [ ] NO [ ]
2.3 Is a spillage kit carried? YES [ ] NO[ ]
2.4 Is an appropriate fire extinguisher carried? YES [ ] NO[ ]
2.5 Is required safety equipment available at the depot in case of emergency? YES [ ] NO[ ]
2.6 Are earthing devices available? YES [ ] NO[ ]
2.7 Are Safety warning signs available and posted? YES [ ] NO[ ]

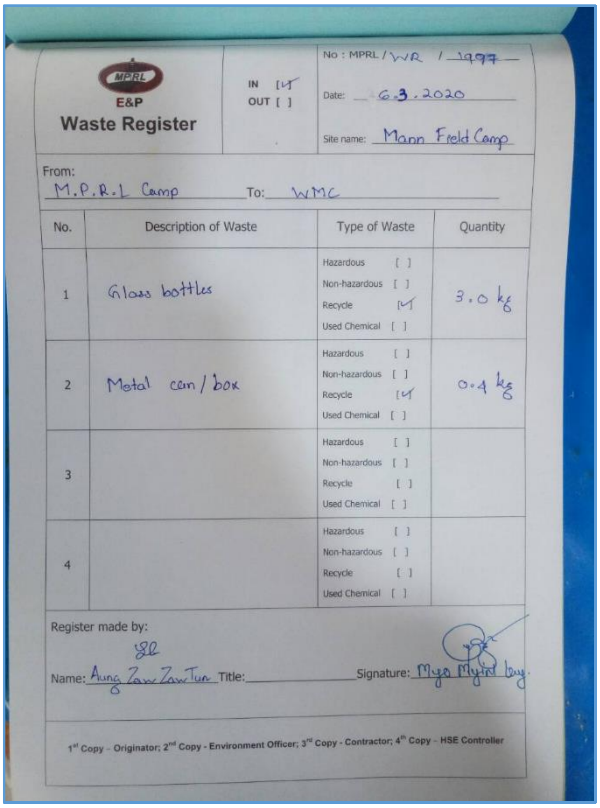
3. Waste Register No.: 15 **Total volume:** 962.775 Kg.

4. Delivery Confirmation

MPRL E&P Representative
Name: Han Myo Aung
Title: EO
Signature:
Date/time: 9-7-2020

Contractor representative
Name: [illegible]
Title: [illegible]
Signature:
Date/time:

1st Copy – Originator; 2nd Copy - Environment Officer; 3rd Copy - Contractor; 4th Copy – HSE Controller


MPRL E&P

Waste Register

IN [✓]
OUT [ ]
No : MPRL / WR / 1997
Date: 6.3.2020
Site name: Mann Field Camp

From: M.P.R.L Camp To: WMC

No.	Description of Waste	Type of Waste	Quantity
1	Glass bottles	Hazardous [ ] Non-hazardous [ ] Recycle [✓] Used Chemical [ ]	3.0 kg
2	Metal can / box	Hazardous [ ] Non-hazardous [ ] Recycle [✓] Used Chemical [ ]	0.4 kg
3		Hazardous [ ] Non-hazardous [ ] Recycle [ ] Used Chemical [ ]	
4		Hazardous [ ] Non-hazardous [ ] Recycle [ ] Used Chemical [ ]	

Register made by:
Name: Aung Zaw Zaw Tun Title: Signature: Myo Myint Lay

1st Copy - Originator; 2nd Copy - Environment Officer; 3rd Copy - Contractor; 4th Copy - HSE Controller

Figure 10: Waste disposal Forms

Hazardous waste, 602 Kg are collected from all work related area and properly storage at Waste Management Compound. Now preparing work order process with GOLDEN DOWA ECOSYSTEM for adequate disposal method.

Figure 11: Hazardous Waste Storage in WMC


Figure 11 A: Hazardous Waste Storage in WMC

4.1.4 Monthly Waste Monitoring Progress

	2017	2018	2019	2020
General Waste	272 Kg	360 Kg	538 Kg	881 Kg
Hazardous Waste	4059 Kg	790 Kg	1198 Kg	346 Kg
Recycle Waste	1069 Kg	1415 Kg	3079 Kg	2005 Kg
Composting	1910 Kg	1783 Kg	1437 Kg	618 Kg
Organic Waste	10128 Kg	7910 Kg	7405 Kg	3159 Kg

Figure 12: Waste Register in WMC

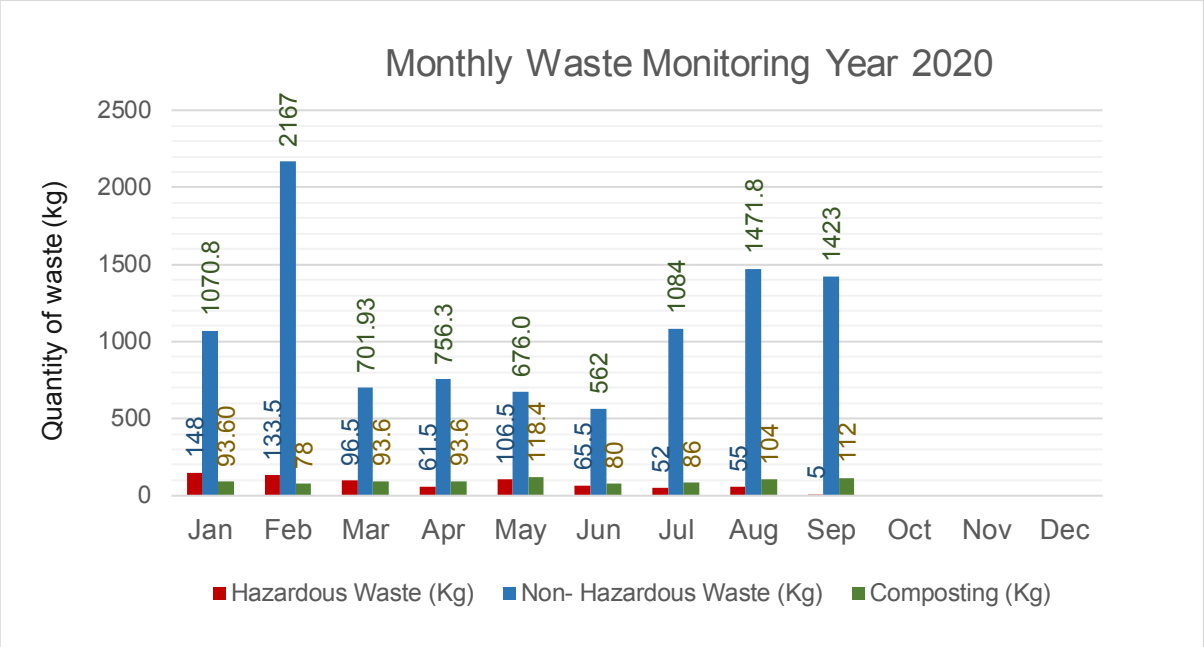


Figure 13: Monthly Waste Monitoring (January to Sep 2020)

4.2 Emergency Response Plan

MPRL E&P has developed plans and procedures to identify the potential for and response to environmental accidents and health and safety emergency situations and for preventing and mitigating any potentially adverse environmental and social impacts that may arise. The plans included to: notification procedures; an emergency response organization with personnel properly trained on their roles and responsibilities; having adequate and appropriate emergency response equipment readily available to respond to minor incidents; and having the capability to quickly request additional assistance.

MPRL E&P is implementing and managing emergency situations from the Project activities in Mann Field. The Emergency Response Plan (ERP), which also covers fire risk management, includes:

- Emergency Response Plan
- Spill Management Plan
- Medical emergencies including medevac procedures;
- Natural disaster (e.g. flood, cyclone, earthquakes) related emergencies;
- Fire and electrical related emergencies

MPRL E&P is conduction the drill exercise together with MOGE and MPRL E&P team as per above mentioned plans.

- Road Traffic Accident Emergency Drill
- Oil Spill Drill
- Muster Drill at the MPRL E&P Base camp

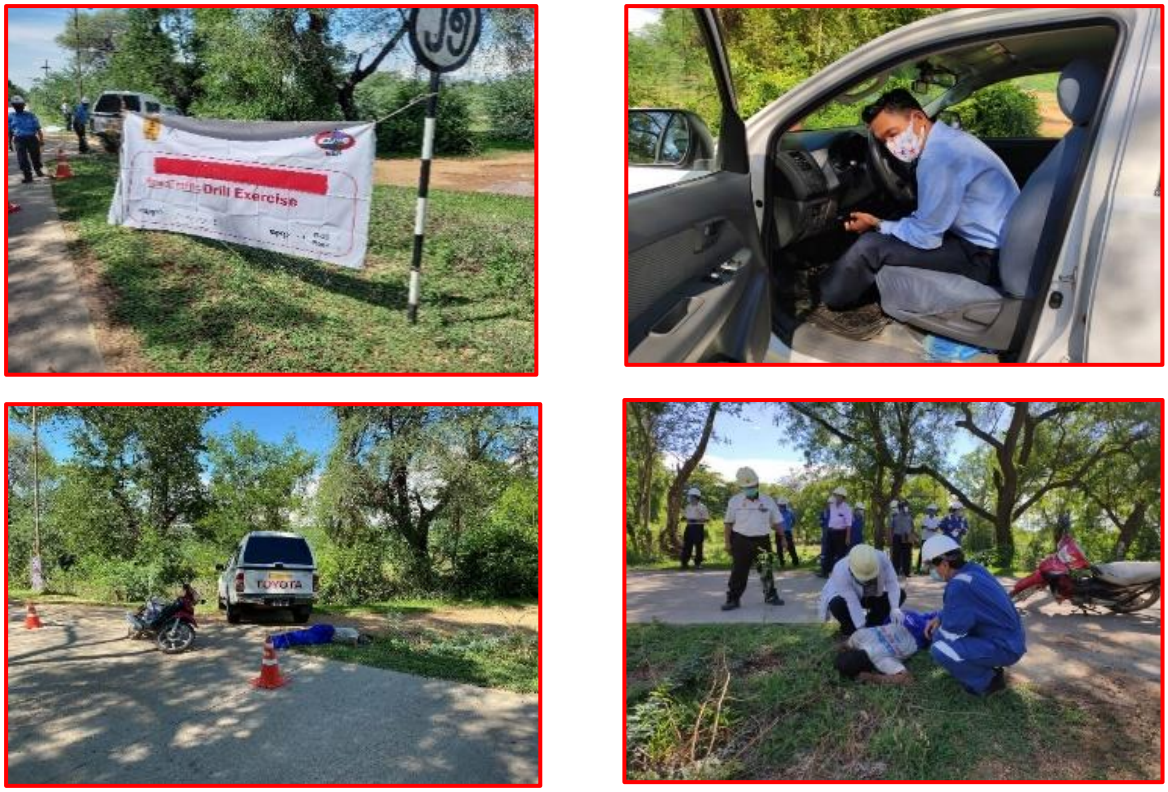


Figure 14: Road Traffic Accident Emergency Exercise

Figure 15: Fire Fighting Awareness

Figure 16: Oil Spill Emergency Response Exercise

Figure 17: Base Camp Mustering Drill

Drill Monitoring Plan

Due to the COVID-19 pandemic situation, some drill exercises are not available to conduct as per plan timeline. However, field team completed the drill exercise based on the available condition and situation. With the observations from those drill exercises, corrective actions have been recorded and implemented for further improvement. MPRL E&P is submitting monthly reporting of the field operations activity to MOGE.

4.3 Implementation of Health and Hygiene Management

In a hot season during April to May, especially when physically active, the human body relies on its ability to get rid of excess heat (i.e., heat dissipation) to maintain a healthy internal body temperature. Heat dissipation happens naturally through sweating and increased blood flow to the skin. Workers cool down more rapidly if the external (environmental) heat and physical activity (metabolic heat) are reduced.

If heat dissipation does not happen quickly enough, the internal body temperature keeps rising and the worker may experience symptoms that include thirst, irritability, a rash, cramping, heat exhaustion, or heat stroke.

Field HSE team conducted heat stress awareness campaign in Mann Field to all MOGE's crew to prevent heat stress and heat stroke during their operations and shared knowledge to raise the awareness level of crews including health hazards and appropriate control measures.

Figure 18: Heat Stress Awareness Campaign

MPRL E&P was providing Oral Rehydration Salts (ORS) to all crew every day and arranged extension of their rest time in day time especially 12:00hr to 15:00hr. Site HSEO and Site Doctors presented safety talks heat related hazards with control measure to prevent heat stroke while performing their daily tasks.

4.4.1 COVID-19 Preventative Plan with Control Measure

According to coronavirus (COVID-19) diseases happened in Global and rapidly spread in all over the World, our organization, like other organizations, may also has a consideration for worse case scenarios in operations support-level which may cause some delay in operation support matters due to multiple factors such as transportation blockage / disrupt, locked down, etc. In this situation, MPRL E&P need to continues to operate as normal as possible, team prepared the following Ministry of Health and Sports (MoHS) prevention procedures and control plan for MPRL E&P's operations during the period.

Protect Mann Field operations staff from COVID-19 global pandemic. Initiate pro-active well servicing, remedial operations and inventory management actions to minimize the loss of Mann Field daily production in case of worst-case scenario.

MPRL E&P's COVID-19 prevention status was inspected by the team who are (U Kyaw Zeya, deputy district commander of district administration department), (Dr. Tint Khaing, District Medical Supervisor) and (Daw Than Than Aye, Officer of SSB) and 2 officers of department of labor.

Figure 19: COVID-19 Workplace Inspection by MoHS & Labor Inspection Department.

<u>Base Camp</u>

- Checked the body temperature for every MFO staff when they come back for field (outside of the camp) (ongoing)
- Arranged to wash the hand with soap and hand gel sanitizer before enter the office, dining room and bedroom (Provided hand gel sanitizer in camp and all worksites)
- Arranged the seating plan for morning technical meeting (maximum 20 person including MOGE coordinators) and postpone the weekly meeting.

- Arranged the seating plan in dining room for social distancing (4 person per table and allow 20 pax per time)
- Stuck COVID-19 Announcement on notice board.


Figure 20: Social distancing in the office & dining room

All Working Area

(5 Pulling units, Warehouse, Mobile Workshop, Downhole Workshop, Pumping Unit Maintenance & Special Project)

- Checked body temperature for all MOGE crew and Casual employee before start the work and in very crew change.
- Talk in toolbox talk meeting and wash the hand with hand gel sanitizer.




Figure 21: Body Temperature Measuring at Workplace

M&As Camp

- Conduct same procedure as base camp. (Checked body temperature and provide the hand gel sanitizer)
- All local staff (Driver and Catering staff) are prohibited from go back home after their duty.
- Minimize the outgoing to market frequency for two times per week (instead of four times)

Crew Change

- Conduct disinfection for crew change bus with third party professional service
- Checked health declaration form for all staffs
- Check body temperature
- Arrange social distancing for the crew seating plan
- Wear face shield and masks all the time in the bus
- All duty entering staff with crew change bus have to meet with camp doctor first for check body temperature and record travel history during day-off.
- For own arrange (use local bus) staff, they have to stay in designated room first and meet with camp doctor for check body temperature and record travel history during day off.
- Strictly follow-up MoHS guideline and Health Declaration Procedure.
- Disinfection for the crew change bus with sanitizer spray.

Figure 22: Disinfection on crew change bus & COVID-19 prevention

Figure 23: COVID-19 Prevention action while crew change

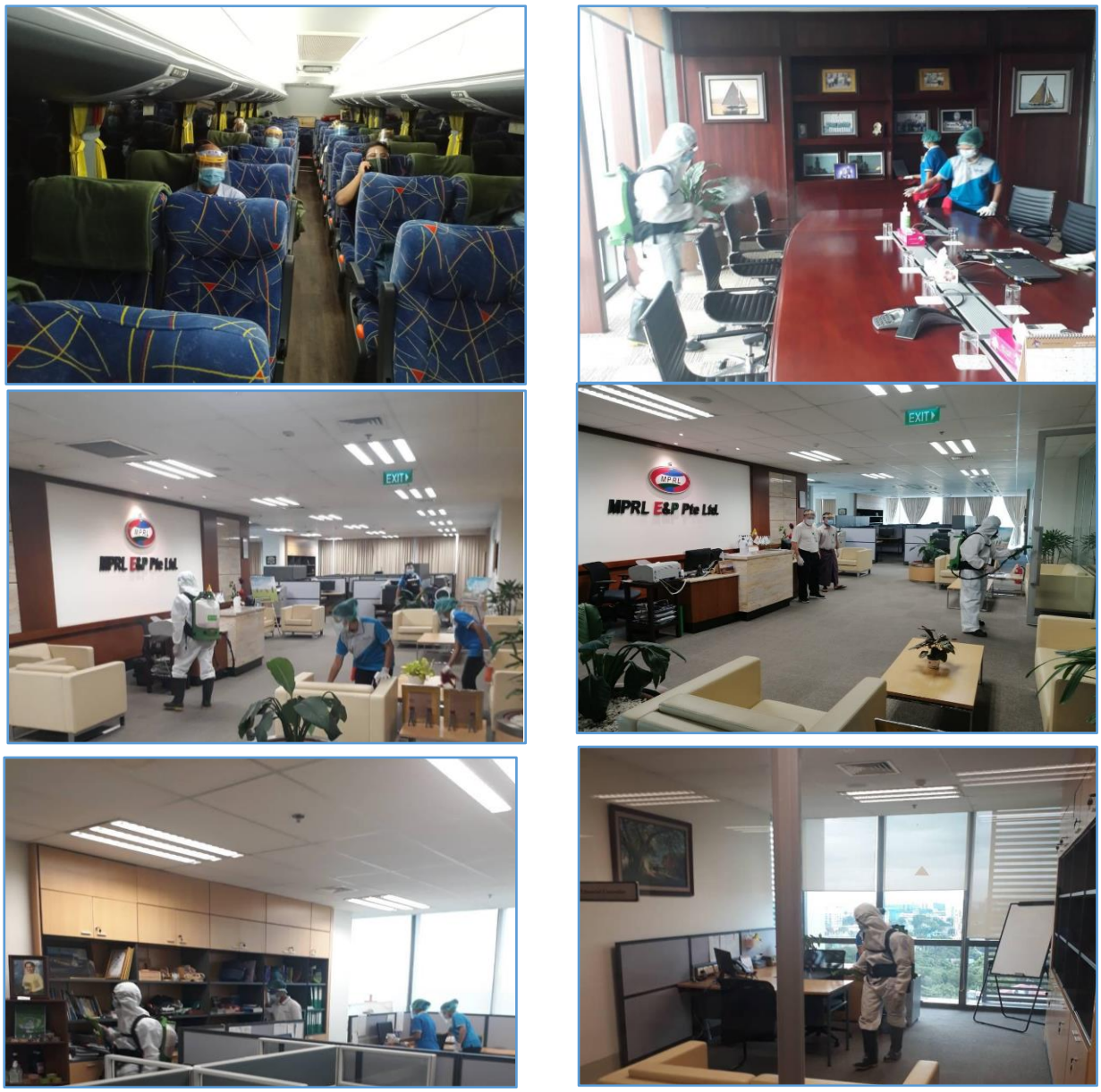


Figure 24: Disinfection in the Office work place

HSE team organizing an on-site vaccinations (Vaxigrip Tetra) for GoCs' employees to protect against infection by influenza viruses during the flu season.

Figure 25: Vaccinations to staffs at office

4.4.2 MEDEVAC Procedures

The purpose of medical evacuation is to allow field crew and the field management team the opportunity to secure essential medical emergency procedures and to refresh and correct procedures in order to be familiar at all times in case of emergency of any kind of injury and incident in the operations.

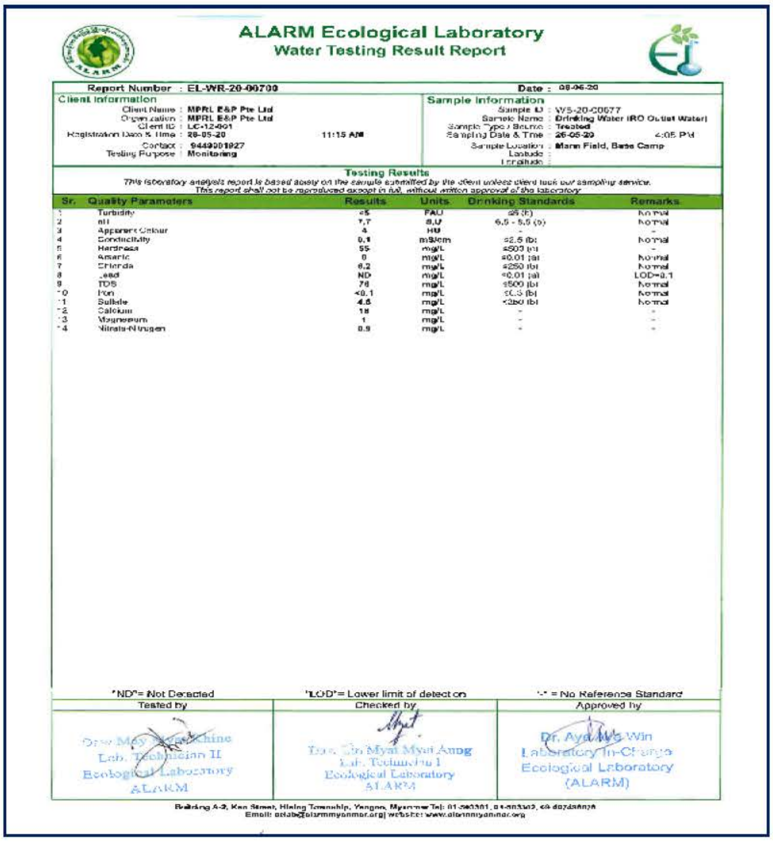
Team conducted the road traffic drill exercise tighter with MEDEVAC Procedures.

Figure 26: Medevac drill exercise photos

4.4.3 Monitoring of Camp Water Quality

In the base camp, MPRL E&P installed a purified drinking water machine (RO System) for drinking and food preparation to cover enough consumption for all staff who are living in the base camp. The team is monitoring water quality quarterly and perform hygiene inspections and audits by the site doctor and HSE team as per the planned schedule.

Figure 27: Drinking Water Purify Machine for the Base Camp



ALARM Ecological Laboratory
Water Testing Result Report

Report Number : EL-WR-20-00700 Date : 08-06-20

Client Information		Sample Information	
Client Name :	MPRL E&P Pte Ltd	Sample ID :	WS-20-00677
Organization :	MPRL E&P Pte Ltd	Sample Name :	Drinking Water (RO Outlet Water)
Client ID :	LC-12-001	Sample Type / Source :	Treated
Registration Date & Time :	26-05-20 11:15 AM	Sampling Date & Time :	26-05-20 4:05 PM
Contact :	9449001827	Sample Location :	Mann Field, Base Camp
Testing Purpose :	Monitoring	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	Turbidity	≤5	FAU	≤5 (b)	Normal
2	pH	7.7	S.U	6.5 - 8.5 (b)	Normal
3	Apparent Colour	4	HU	-	-
4	Conductivity	0.1	mS/cm	≤2.5 (b)	Normal
5	Hardness	55	mg/L	≤500 (b)	-
6	Arsenic	0	mg/L	≤0.01 (a)	Normal
7	Chloride	6.2	mg/L	≤250 (b)	Normal
8	Lead	ND	mg/L	≤0.01 (a)	LOD=0.1
9	TDS	76	mg/L	≤500 (b)	Normal
10	Iron	<0.1	mg/L	≤0.3 (b)	Normal
11	Sulfide	4.6	mg/L	≤250 (b)	Normal
12	Calcium	18	mg/L	-	-
13	Magnesium	1	mg/L	-	-
14	Nitrate-Nitrogen	0.9	mg/L	-	-

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

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

Building A-2, Kan Street, Hlaing Township, Yangon, Myanmar Tel: 01-503301, 01-503302, 09-407486076
Email: eclab@alarmmyanmar.org| website: www.alarmmyanmar.org

Figure 28: Drinking Water Parameter Results

Sr.	Analysis	Results	Units	NDWG (Myanmar - Draft 2019)	Remarks
1	pH	7.7	S.U	6.5 ~ 8.5	Normal
2	Turbidity	<5	FAU/ NTU	5	Normal
3	Apparent Colour	4	HU	-	-
4	Hardness	55	mg/l	500	Normal
5	Arsenic	0	mg/l	0.01	Normal
6	Chloride	6.2	mg/l	250	Normal
7	Lead	0	mg/l	0.01	Normal
8	Total Dissolved Solids	76	mg/l	1000	Normal
9	Iron	<0.1	mg/l	1	Normal
10	Electrical Conductivity (EC)	0.1	mS/cm	-	Normal
11	Sulfate	4.5	mg/l	250	Normal
12	Calcium	18	mg/l	200	Normal
13	Magnesium	1	mg/l	150	Normal
14	Nitrate-Nitrogen	0.9	mg/l	50	Normal

Figure 29: Drinking Water Quality Monitoring Results

- *WHO Standard for Drinking Water (2011);*
- *US EPA Drinking Water Standard;*
- *National Drinking Water Guideline (Draft);*
- *Myanmar Emission Guideline (2015)*

5.0 Environmental Monitoring Plan

Monitoring will be conducted to ensure compliance with regulatory requirements as well as to evaluate the effectiveness of operational controls and other measures intended to mitigate potential impacts.

As a minimum, the following monitoring on the physical environment will be undertaken:

Physical Environment Monitoring

- Ambient air quality;
- Noise;
- Groundwater quality;
- Surface water quality and
- Soil quality.

Monitoring will be undertaken during the following periods of the EOR and re-development program activities:

- At least two weeks before the construction activities for baseline data collection.

- Monthly monitoring for the first three months during both the construction and operation phase. After the three month period, a review should be conducted to determine whether the collected data indicates an impact has occurred beyond what has been predicted within the EIA. Should no higher impacts be observed, monitoring can be reduced to a six-monthly or yearly programme. Should higher impacts be observed, monitoring should continue and appropriate actions be taken to alleviate the impacts with an aim to prevent any further impacts from occurring.

After first monitoring report with a three-month survey during the six-month period, no higher impacts are observed from the existing operations, however after conducted the air quality and the results shown some monitoring point occurred CO, PM2.5 and SO2 value is still higher than based line value compared with May 2015 survey results.

As per EIA commitments, MPRL E&P was conducting Environmental monitoring activities that started from July 2019 to September 2019 (three months), submitted the monitoring report to the Environmental Conservation Department (ECD) on 29 October 2019 and the second time monitoring report submitted on 28 April 2020. This is the third time conducting of monitoring survey after six months as per the environmental monitoring plan. (Table 8.3 Environmental and Social Monitoring Programme)

Table 8.3 ***Environmental and Social Monitoring Programme***

Project Stage	Potential Impact	Parameters to be Monitored	Location	Measurements	Frequency	Responsibility
At least two weeks before the construction activities for baseline data collection. Construction and Operation	Air Quality	NOx, SO2, PM2.5, PM10, CO. Check compliance with Myanmar National Environmental Quality (Emission) Guidelines (2015).	Z1AQN, Z2AQN, Z3AQN and Z4AQN,	Sampling and analysis of ambient air pollutants to be conducted accordingly to the guidelines of Myanmar NEQEG. Haz-Scanner EPAS Wireless Environmental Perimeter Air Station to be used for measurement.	Monthly monitoring for the first three months during both the construction and operation phase. After the three month period, a review should be conducted to determine whether the collected data indicates an impact has occurred beyond what has been predicted within the EIA. Should no higher impacts be observed, monitoring can be reduced to a six-monthly or yearly programme. Should higher impacts be observed, monitoring should continue and appropriate actions be taken to alleviate the impacts with an aim to prevent any further impacts from occurring	MPRL E&P HSE Coordinator
At least two weeks before the construction activities for baseline data collection.	Noise	Check compliance with Myanmar National Environmental Quality	Z1AQN, Z2AQN, Z3AQN and Z4AQN,	24-hour noise monitoring using the portable sound meter (Lutron, SL-0423SD,	As above	MPRL E&P HSE Coordinator

Construction and Operation		(Emission) Guidelines (2015)		unit: dB). Noise level (LAeq) measured and recorded at a ten-minute interval and averaged at an hourly and daily (i.e. 24-hour) interval.		
At least two weeks before the construction activities for baseline data collection. Construction and Operation	Groundwater Quality	Situ measurements for transparency, temperature, pH DO, turbidity, colour, alkalinity and hardness. Laboratory analysis of BOD5, COD, Total Nitrogen, Total Phosphorus, Oil and grease, TSS, *E. coli*, Arsenic, Barium, Boron, Total Chromium, Floride, Selenium, Uranium	Z1GW, Z2GW, Z3GW and Z4GW,	In-situ measurements for transparency, temperature, pH DO, turbidity, colour, alkalinity and hardness. Laboratory analysis of BOD5, COD, Total Nitrogen, Total Phosphorus, Oil and grease, TSS, *E. coli*, Arsenic, Barium, Boron, Total Chromium, Floride, Selenium, Uranium	As above	MPRL E&P HSE Coordinator

At least two weeks before the construction activities for baseline data collection. Construction and Operation	Surface Water Quality	In-situ measurements for transparency, temperature, pH DO, turbidity, colour, alkalinity and hardness. Laboratory analysis of BOD5, COD, Total Nitrogen, Total Phosphorus, Oil and grease, TSS, *E. coli*, Arsenic, Barium, Boron, Total Chromium, Floride, Selenium, Uranium	Z1SW, Z2SW, Z3SW and Z4SW,	In-situ measurements for transparency, temperature, pH DO, turbidity, colour, alkalinity and hardness. Laboratory analysis of BOD5, COD, Total Nitrogen, Total Phosphorus, Oil and grease, TSS, *E. coli*, Arsenic, Barium, Boron, Total Chromium, Floride, Selenium, Uranium	As above	MPRL E&P HSE Coordinator
At least two weeks before the construction activities for baseline data collection. Construction and Operation	Soil Quality	pH; Arsenic (As); Lead (Pb); Cadmium (Cd); Copper (Cu); Zinc (Zn); Manganese (Mn); and Iron (Fe). Comparison with the	Z1S, Z2S, Z3S and Z4S,	Follow sampling procedure, sample preservation and sample analysis recommended in Myanmar NEQEG. Laboratory analysis of pH; Arsenic (As); Lead (Pb); Cadmium (Cd);	As above	MPRL E&P HSE Coordinator

		Dutch Standard 2000.		Copper (Cu); Zinc (Zn); Manganese (Mn); and Iron (Fe).		
Construction and Operation	Discharge of treated wastewater and runoff	Check compliance with Myanmar National Environmental Quality (Emissions) Guidelines for site runoff and wastewater discharges (for BOD, COD, TSS, oil and grease, pH, total coliform bacteria, total nitrogen, total phosphorus) during construction. Check compliance with Myanmar National Environmental Quality (Emissions) Guidelines for Onshore Oil and Gas	Treated wastewater discharge points at discharge points such as worker camps, GOCS, shut in wells.	In-situ measurements for pH, temperature, dissolved oxygen (DO), electrical conductivity (EC), and turbidity. Laboratory analysis of BOD5, COD, Total Suspended Solids, Total Nitrogen, Total Phosphorous, Oil and Grease	As above	MPRL E&P HSE Coordinator

		Development during operation.				
Operation	Vented gas	Check compliance with Myanmar National Environmental Quality (Emissions) Guidelines for Onshore Oil and Gas	Three vented gas location (randomly selected)	Real-time measurement	Monthly monitoring for the first three months during operation phase. After the three month period, a review should be conducted to determine whether the collected data indicates an impact has occurred beyond what has been predicted within the EIA. Should no higher impacts be observed, monitoring can be reduced to a six-monthly or yearly programme. Should higher impacts be observed, monitoring should continue and appropriate actions be taken to alleviate the impacts with an aim to prevent any further impacts from occurring	MPRL E&P HSE Coordinator

5.1 Ambient Air Quality

5.1.1 Ambient Air Monitoring Station

Table 2.0: Ambient Air Quality and Noise Monitoring Stations

Monitoring Stations	GPS Coordinates	Sampling Date (Baseline)	Sampling Date (Monitoring)
Z1AQN	20˚19' 39.0'' N 94˚49' 18.4'' E	8 – 9 May 2015	25 – 26 July 2020
Z2AQN	20˚15' 40.6'' N 94˚50' 08.0'' E	7 – 8 May 2015	24 – 25 July 2020
Z3AQN	20˚13' 21.5'' N 94˚51' 19.6'' E	6 - 7 May, 2015	22 – 23 July 2020
Z4AQN	20˚11' 41.9'' N 94˚52' 32.4'' E	6 - 7 May 2015	23 – 24 July 2020

5.1.2 Monitoring Parameters and Equipment

Sampling and analysis of ambient air pollutants was conducted accordingly to the guidelines of NEQEG. The Haz-Scanner EPAS Wireless Environmental Perimeter Air Station was used to collect Ambient Air Monitoring data, which is a portable monitor that records real time data that directly logged the ambient air quality measurements as well as climatological data. The air quality parameters and meteorological data collected in the survey are listed in below table 3.0.

5.1.3 Monitoring Parameters

Table 3.0: Air Monitoring Parameter

Parameters		Unit	Method and Duration
Air Quality			*In situ* reading for 24-hour
Sulfur dioxide (SO_2)		ppm	
Carbon monoxide (CO)		ppm	
Nitric oxide (NO)		ppm	
Nitrogen dioxides (NO_2)		ppm	
Particulate matter < 2.5 µm ($PM_{2.5}$)		mg/m^3	
Particulate matter < 10 µm (PM_{10})		mg/m^3	
Meteorological Data			
Relative Humidity (R.H.)		%	
Temperature		°C	
Wind speed		kph	
Wind direction		-	

5.1.4 Air Monitoring Location Map

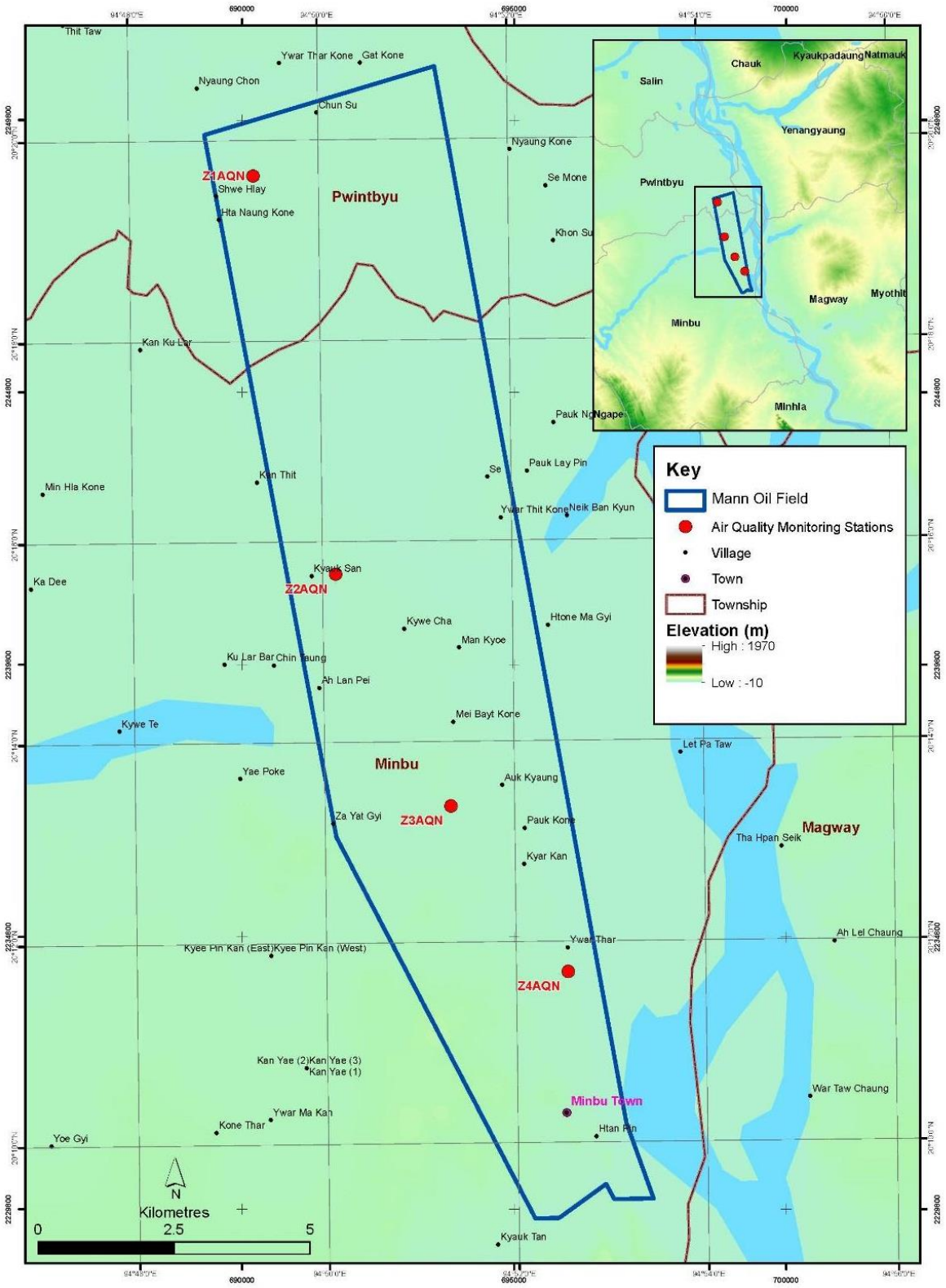


Figure 30: Locations of Air and Noise Monitoring Stations

Figure 31: Station - Z1AQN (Air & Noise Monitoring)

Figure 32: Station – Z2AQN (Air & Noise Monitoring)

Figure 33: Station – Z3AQN (Air & Noise Monitoring)

Figure 34: Station – Z4AQN (Air & Noise Monitoring)

5.1.5 Air Monitoring Results

Table 4.0: Summary of Air Quality Monitoring Results (July – 2020)

Parameters	Monitoring Stations (Baseline-May-2015)				Monitoring Stations (July-2020)				
	Z1AQN (ppm)	Z2AQN (ppm)	Z3AQN (ppm)	Z4AQN (ppm)	Z1AQN (µg/m^3)	Z2AQN (µg/m^3)	Z3AQN (µg/m^3)	Z4AQN (µg/m^3)	NEQEG Guideline
CO (24-hr)	0.14	0.11	0.05	0.13	161.78	146.02	50.89	122.71	-
NO_2 (1-hr)	0.10	0.10	0.03	0.09	84.79	186.78	102.96	101.14	**200**
NO	0.31	0.07	<0.01	0.14	-	-	-	-	-
$PM_{2.5}$ (24-hr)	0.04	0.03	0.02	0.03	7.43	6.83	5.22	6.84	**25**
PM_{10} (24-hr)	0.05	0.04	0.04	0.04	14.88	19.75	38.08	23.51	**50**
SO_2 (10-min)	0.02	0.03	<0.01	0.01	50.52	202.34	63.35	138.21	**500**
Temp (˚C)	30.7	29.0	31.5	27.1	32.58	37.11	35.17	35.32	-
Relative Humidity (%)	61	61	56	55	58.24	62.52	63.04	64.18	-
Wind Speed (m/s)	0	0.015	0.081	0.85	0.97	0.19	5.68	0.20	-
Wind Direction	-	South West	South East	South East	-	South West	South East	South East	-

Assessment Criteria: National Environmental Emission Guideline Value					
	O_3	NO_2	$PM_{2.5}$	PM_{10}	SO_2
24-hr	-	-	25 µg/m^3	50 µg/m^3	20 µg/m^3
8-hr	100 µg/m^3	-	-	-	
1-hr	-	200 µg/m^3	-	-	-
10-min	-	-	-	-	500 µg/m^3

All the air quality monitoring parameters are under the NEQEG guideline values. In the third time monitoring report, attached the detailed record of human activities around the measurement locations zone's community areas in the activity logbook during the monitoring period.

5.2 Noise

The aim of baseline noise monitoring is to establish the background level at nearby Noise Sensitive Receivers (NSRs).

5.2.1 Methodology

Four noise monitors were set up to measure background noise levels for 24 hours at the identified NSRs, which was the same location and monitoring period as per the ASRs. The surrounding environment of the noise quality monitoring stations is shown in Table 5.0. These survey points were chosen to represent baseline noise levels at NSRs within the wider Mann Field area as per EIA report.

5.2.2 Noise Monitoring Location

Table 5.0: Noise Monitoring Stations

Sampling Point	GPS Coordinates	Description	Land use
Z1AQN	20° 19' 39.0'' N 94° 49' 18.4'' E	Located at southwestern part of Pauk Su village, Pwint Phyu Township.	Residential
Z2AQN	20° 15' 40.6'' N 94° 50' 08.0'' E	Located at eastern part of Kyauk San village, near monastery compound.	Residential
Z3AQN	20° 13' 21.5'' N 94° 51' 19.6'' E	In the MPRL E&P office compound, south of staff housing, well No.521 also located nearby.	Commercial
Z4AQN	20° 11' 41.9'' N 94° 52' 32.4'' E	Located at eastern part of Minbu Town, close to the western bank of the Ayeyarwady River	Bare ground

The 24-hour baseline noise monitoring was conducted by using the portable sound meter (Lutron, SL-0423SD, unit: dB). The noise level (L_{Aeq}) was measured and recorded at a ten-minute interval and averaged at an hourly and daily (i.e. 24-hour) interval using the following formula:

$L_{Aeq} = 10*LOG_{10}(AVERAGE(10^((RANGE)/10)))$

Table 6.0: NEQEG Noise Level Parameters

Receptor	One hour LAeq (dBA)[a]	
	Daytime 07:00 – 22:00 (10:00 - 22:00 for Public holidays)	**Night Time 22:00 – 07:00 (22:00 - 10:00 for Public holidays)**
Residential, institutional, educational	55	45
Industrial, commercial	70	70

an Equivalent continuous sound level in decibels

5.2.3 Baseline Noise Measurements

The results of baseline noise monitoring are summarized in Table 6. The NEQEG was adopted to evaluate the measured noise levels in the area which was in the vicinity of existing oil and gas operations (Table 5). The results of noise monitoring showed that the hourly and daily noise levels at all monitoring stations were generally well below the standard as stipulated in the NEQEG guidelines, and it thus appeared that the existing oil-producing facilities were operated in an environmentally acceptable manner concerning noise emissions.

Notes: By the monitoring survey results,

At the day time, the point only at Z2AQN has a higher value than NEQEG in 2015 monitoring results. But in 2020, we see the point Z3AQN only is over. That point is

situated beside the G-20 concrete main road and all vehicles of community are widely used.

At night time, we can see the results at Z2AQN, Z3AQN, and Z4AQN are over the NEQEG in both 2015 and 2020.

Coincidently where we do our monitoring at Z2AQN, Z3AQN and Z4AQN, heard sounds from the donations/festivals and also that points were located near the housings and access roads.

5.2.4 Noise Monitoring Result

Table 7.0: Hourly LA_{eq} Values at the Designated Noise Monitoring Stations

Monitoring Time	Stations (Baseline-May-2015)				Stations (July-2020)			
	Z1AQN	Z2AQN	Z3AQN	Z4AQN	Z1AQN	Z2AQN	Z3AQN	Z4AQN
6:00-7:00	72	83	58	50	55.74	56.74	53.79	51.89
7:00-8:00	48	76	50	46	56.11	57.03	55.95	52.04
8:00:9:00	44	74	54	52	54.05	52.74	55.56	52.21
9:00-10:00	43	72	53	45	51.64	51.66	54.57	51.66
10:00-11:00	68	56	49	45	50.62	47.83	54.40	53.22
11:00-12:00	45	68	49	52	47.89	49.26	53.33	51.67
12:00-13:00	45	74	55	41	47.28	53.16	52.76	49.53
13:00-14:00	45	47	47	39	44.39	51.71	52.20	48.84
14:00-15:00	56	47	48	39	46.47	47.96	52.27	48.39
15:00-16:00	43	46	63	52	54.12	49.15	51.84	54.12
16:00-17:00	47	52	63	45	53.88	50.55	55.58	57.04
17:00-18:00	49	50	65	52	49.36	51.14	56.14	53.19
18:00-19:00	48	66	66	51	52.38	57.52	54.92	51.99
19:00-20:00	50	63	50	54	53.19	59.45	54.52	53.32
20:00-21:00	59	52	56	51	57.68	56.56	57.15	58.34
21:00-22:00	54	49	47	64	57.75	58.32	57.63	53.12
Day LA_{eq}	51	60	54	48	52.03	53.17	54.53	52.54
22:00-23:00	49	50	41	52	58.49	59.33	56.31	59.83
23:00-24:00	44	50	75	55	58.39	52.15	54.51	58.73
24:00-1:00	42	63	42	53	58.50	51.71	53.63	57.92
1:00-2:00	42	59	44	51	57.96	52.87	53.20	54.74
2:00-3:00	42	49	41	60	59.10	51.21	53.18	55.02
3:00-4:00	43	50	41	60	59.18	51.34	53.25	55.65
4:00-5:00	43	60	57	60	58.44	51.71	53.44	54.53
5:00-6:00	47	62	58	57	62.18	55.93	55.70	54.44
Night LA_{eq}	44	55	50	56	53.09	53.28	54.15	56.35

ပတ်ဝန်းကျင်ရေးရာဓာတ်ခွဲခန်း
Ecological Laboratory
စိမ်းလန်းအဓိဋ္ဌာန်မြေ့ မြေတိုးတက်ရေးအသင်း (Advancing Life and Regenerating Motherland, ALARM)

Sampling Site	Location	Date	Weather Condition	Pollution Period		Pollution Type		Remark
				From	To	Car	Motorbike	
Z3AQN	Near the M-89, Minbu Township	22.7.2020	Sunny	7:00AM	8:00AM	15	90	
			.	8:00AM	9:00AM	24	140	
				9:00AM	10:00AM	37	110	
			.	12:00PM	1:00PM	7	100	
				1:00PM	2:00PM	16	110	
			.	2:00PM	3:00PM	18	60	
				3:00PM	4:00PM	15	60	
			Sunny	4:00PM	5:00PM	24	90	
			Rainy	5:00PM	6:00PM	12	120	
			Cloudy					
Z3AQN (Community)	Mei Bayt Kone Village	23.7.2020	Sunny	7:41AM	8:41AM	29	133	
Z4AQN (Community)	Minbu-Pwint Phyu Road	24.7.2020	Sunny	9:52AM	10:00AM	195	842	Cement Mixer ,
Z2AQN (Community)	Middle of Kyauk San Village	25.7.2020	Sunny	12:50PM	1:50PM	13	158	Near the market of Kyauk San Village
Z1AQN (Community)	Pauk Su Village	26.7.2020	Sunny	4:07PM	5:07PM	10	101	

Figure 35: Logbook for Air & Noise Quality Monitoring at Community Areas

Note: *All noise monitoring results in day time were under the NEQEG guideline, however Z1AQN & Z2AQN results (in night time) are a little higher than NEQEQ guideline due to motorbikes usages due to the community access roads.*

5.3 Surface Water Quality

5.3.1 Methodology

To characterize the surface water quality within the Project Area, surface water sampling was carried out at four locations in May-2015, July 2019, August 2019, September 2019, February 2020 and July 2020. Details of sampling locations are presented in below table 8.0. The surrounding environment of the surface water sampling location is shown in Figure 36. These survey points were chosen to represent baseline water quality at WSRs within the wider Mann Field area where the Project will be implemented.

5.3.2 Locations of Surface Water Monitoring Stations

Table 8.0: Surface Water Monitoring Stations

Sampling Location	Coordinates	Description	Sampling Date	Monitoring Date
Z1SW-1	20°19'47.67"N 94°49'6.88"E	Mone Chaung, near Pauk Su village.	9 May 2015	26 July 2020
Z1SW-2	20°19'57.80"N 94°49'10.19"E	Mone Chaung, about 320 m downstream of Z1SW-1	9 May 2015	26 July 2020
Z2SW-1	20°15'29.55"N 94°50'1.86"E	Mann Chaung, near Kyauksan village.	7 May 2015	25 July 2020
Z2SW-2	20°15'33.13"N 94°50'3.93"E	Mann Chaung, about 120 m downstream of Z2SW-1	7 May 2015	25 July 2020
Z3SW-1	20°14'46.51"N 94°51'0.27" E	Mann Chaung, near Kywegya village	6 May 2015	25 July 2020
Z3SW-2	20°14'45.74"N 94°51'1.87"E	Mann Chaung, about 50 m downstream of Z3SW-1	6 May 2015	25 July 2020
Z4SW-1	20°11'41.31"N 94°52'41.11"E	Near west bank of Ayeyarwady river, Minbu Township.	6 May 2015	25 July 2020
Z4SW-2	20°11'38.80"N 94°52'42.50"E	Ayeyarwady river, about 90 m downstream of Z4SW-1	6 May 2015	25 July 2020

5.3.3 Location Map for Surface Water

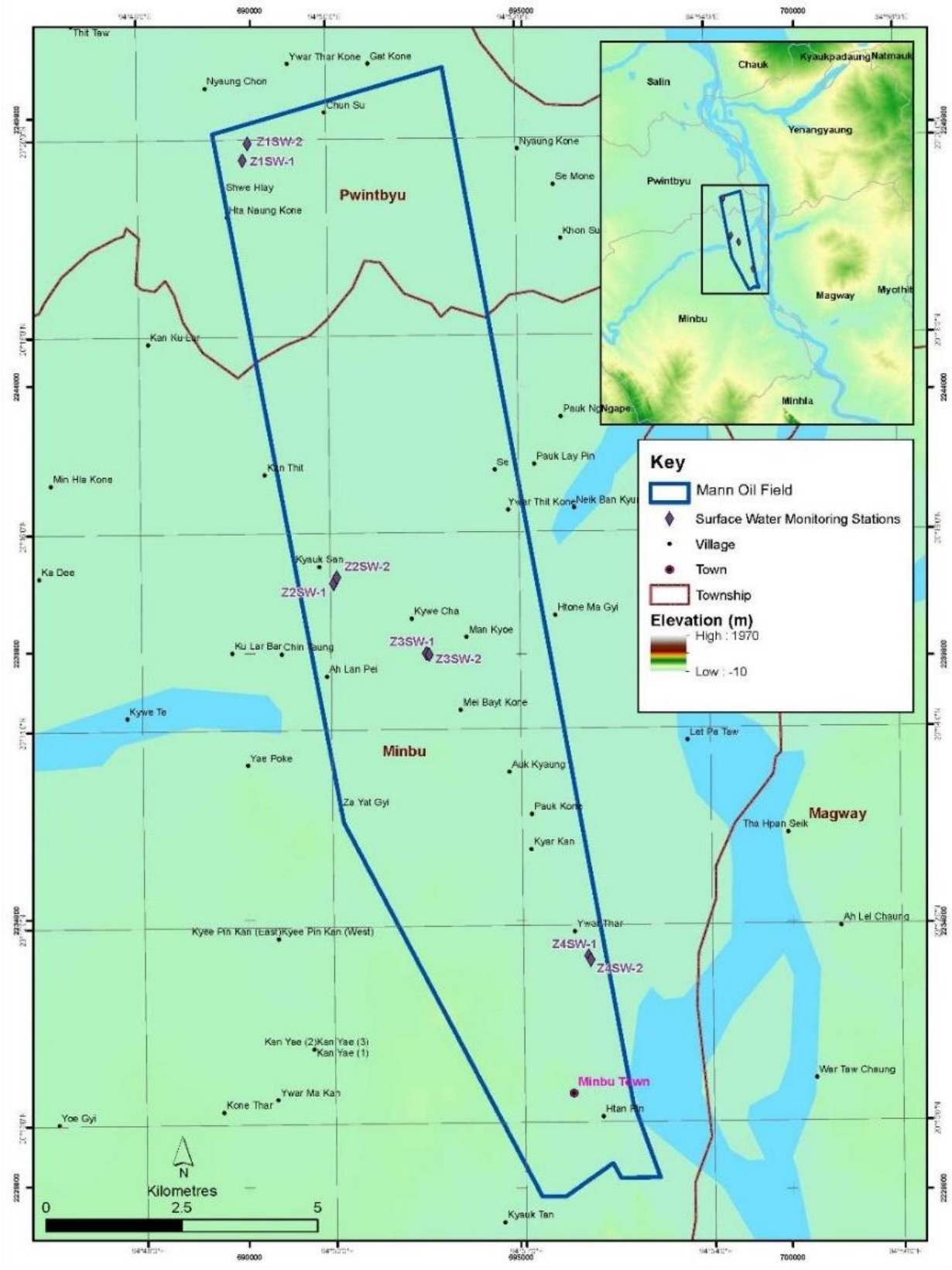


Fig 36: Sampling Locations for Surface Water Quality

5.3.4 Sampling Procedures

Water samples were taken by WaterMark® Vertical PVC Water Bottle with Case, 2.2 Litre (Water Sampler) and collected in sterilized sample containers. All sampling was in strict accordance with recognized standard procedures. The parameters for *in situ* measures included pH, temperature, dissolved oxygen (DO), electrical conductivity (EC), turbidity and surface water samples that were concurrently collected. Two samples were taken at each sampling location. Samples were then stored at 4 ºC for transportation to laboratory analyses under chain-of-custody procedures. The parameters for laboratory analyses were listed in Table 8. Laboratory analysis of samples was undertaken by Ecological Laboratory. Equipment for surface water sampling is shown in Table 9.

Table 9.0: Parameters for laboratory Analyses of Baseline Surface Water Monitoring

Parameters	Unit
BOD_5	mg/L
COD	mg/L
Total Suspended Solids	mg/L
Total Nitrogen	mg/L
Total Phosphorus	mg/L
Total Coliform Bacteria	-
Oil and Grease	mg/L
Heavy Metals	-

Table 10.0: Equipment for Surface Water Sampling

Equipment	Brand	Model
Multi parameter (water quality)	HANNA	-
pH meter	HANNA	HI 98129
WaterMark® Vertical PVC Water Bottle with Case, 2.2 Litre (Water Sampler)	USA	-

5.3.5 Surface Water Results

Mann Field is located at the northwest of Minbu District, Magway Region. Mann Field Area is elongated running north-south, at the west of Ayeyarwady River. The total length of lower Ayeyarwady River Basin is 690 km with a total catchment area of 95,600 km^2 and annual surface water of 85.80 km^3. Results of surface water quality monitoring are summarized in *Table 10*.

A total of eight (8) surface water sampling had conducted and mentioned the results to compare the Vietnam surface water guideline, WHO, EPA, and NDWG. According to the sampling results in Table 10, most water parameters were found to be within all four compared standards guidelines except Uranium is not available testing in the lab due to the COVCID-19 pandemic situation. These parameter results will be presented in next monitoring report if local lab measurement is available.

Station: Z1SW-1

Station: Z1SW-2

Station: Z2SW-1

Station: Z2SW-2

Figure 37: Surface Water Sampling Location (July - 2020)

Station: Z3SW-1

Station: Z3SW-2

Station: Z4SW-1

Station: Z4SW-2

Figure 38: Surface Water Sampling Location (July - 2020)

5.3.6 Result Summary of Surface Water Quality

Table 11.0: Result Summary of Surface Water Quality Monitoring (July - 2020)

Item/Sample Name	Baseline Data Sample Locations (May-2015)				Sample Locations for Monitoring (July-2020)				Vietnam Standard	WHO Standard	EPA Standard	NDWG (Myanmar) 2019
	Z1SW-1	Z1SW-2	Z2SW-1	Z2SW-2	Z1SW-1	Z1SW-2	Z2SW-1	Z2SW-2				
Date /Time	9/5/15 09:22	9/5/15 09:45	7/5/15 11:09	7/5/15 11:22	6/2/20 09:41	6/2/20 10:00	6/2/20 01:41	6/2/20 01:28				
Weather	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny				
Transparency	High	High	High	High	Medium	Medium	Medium	Medium				
Temp _Water (˚C)	30.89	30.82	34.72	35.43	30.7	30.6	33.7	32.9				
pH	7.82	7.82	8.21	8.27	8.03	8.02	8.03	8.03	5.5 - 9	6.5 – 8.5	-	6.5 - 8.5
DO (mg/l)	6.56	6.61	14.6	15.25	6.34	6.45	7.28	7.6	≥2	-	-	-
EC (µs)	352	350.1	611.2	588.7	0.35	0.34	0.432	0.424	-	-	-	-
Turbidity (FNU)	16	13.4	18.5	20.9	<5	<5	<5	<5	-	-	-	5
Colour (HU)	20	20	Nil	Nil	33	Nil	1	Nil	-	-	-	15
Alkalinity (mg/l)	137	136	209	209	141	163	166	165	-	-	-	-
Hardness	127	128	144	133	150	125	190	175	-	-	-	500
BOD_5 (mg/l)	14	14	12	12	5.2	4.3	3.3	3	<25	-	-	-
COD (mg/l)	32	32	32	32	<30	<30	<30	<30	<35	-	-	-
Total Nitrogen (mg/l)	<2	<2	11	4	1.0	<0.5	<0.5	<0.5	15	-	10	-
Total Phosphorus (mg/l)	0.061	0.026	0.039	0.030	0.08	0.15	0.21	0.16	-	-	-	-
Oil and grease (mg/l)	<1	<1	<1	2	5	6	5	4	0.3	-	-	-
TSS (mg/l)	40	34	23	18	3	1	1	0	80	-	-	-
E. coli (CFU/mL)	-	-	-	-	10	0	0	0	-	0	-	0
Total Coliforms (CFU/mL)	-	-	-	-	3000	176	123	220	10000	0	-	0
Arsenic (mg/l)	-	-	-	-	0	0	0	0	0.1	0.01	0.05	0.05
Barium (mg/l)	-	-	-	-	0.018	≤0.002	0.004	0.010	4	0.7	2	0.7
Boron (mg/l)	-	-	-	-	0.1	<0.1	1.2	<0.1	-	2.4	-	2.4
Total Chromium (mg/l)	-	-	-	-	≤0.002	≤0.002	≤0.002	≤0.002	-	0.05	0.1	-
Fluoride (mg/l)	-	-	-	-	0.58	0.13	0.25	0.12	1.5	1.5	4	1.5
Selenium (mg/l)	-	-	-	-	≤0.010	≤0.010	≤0.010	≤0.010	-	-	0.05	0.04
Uranium (mg/l)	-	-	-	-	TBA	TBA	TBA	TBA	-	0.03	0.03	0.03

Table 11.0 (A): Result Summary of Surface Water Quality Monitoring (July - 2020)

Item/Sample Name	Baseline Data Sample Locations (May-2015)				Sample Locations for Monitoring (July-2020)				Vietnam Standard	WHO Standard	EPA Standard	NDWG (Myanmar) 2019
	Z3SW-1	Z3SW-2	Z4SW-1	Z4SW-2	Z3SW-1	Z3SW-2	Z4SW-1	Z4SW-2				
Date /Time	6/5/15 12:08	6/5/15 12:35	6/5/15 15:22	6/5/15 15:51	5/2/20 09:02	5/2/20 09:17	5/2/20 07:37	5/2/20 07:20				
Weather	Sunny	Sunny	Sunny	Sunny	Cloudy	Cloudy	Cloudy	Cloudy				
Transparency	High	High	Medium	Medium	Low	Low	Low	Low				
Temp _Water (˚C)	37.66	37.62	31.55	31.18	31.1	31.1	28.3	28.2				
pH	8.1	8.11	7.73	7.65	7.53	7.45	7.75	7.62	5.5 - 9	6.5 – 8.5	-	6.5 - 8.5
DO (mg/l)	11.33	11.52	7.12	7.15	6.41	6.82	6.42	6.41	≥2	-	-	-
EC (µs)	711.8	705.7	153	152.5	0.147	0.147	0.172	0.102	-	-	-	-
Turbidity (FNU)	7.1	7	25	43.7	64	49	109	41	-	-	-	5
Colour	5	10	45	55	403	367	740	422	-	-	-	15
Alkalinity	238	237	58	58	51	60	39	33	-	-	-	-
Hardness	144	150	58	50	75	60	60	70	-	-	-	500
BOD_5 (mg/l)	10	10	14	16	3.8	4.1	3.6	3.8	<25	-	-	-
COD (mg/l)	32	32	32	32	<30	<30	<30	<30	<35	-	-	-
Total Nitrogen (mg/l)	3	9	19	18	1.5	1.2	1.3	0.9	15	-	10	-
Total Phosphorus (mg/l)	0.047	0.051	0.071	0.031	0.23	0.21	0.33	0.26	-	-	-	-
Oil and grease (mg/l)	5	7	<1	<1	4	7	5	2	0.3	-	-	-
TSS (mg/l)	7	13	124	138	69	55	108	47	80	-	-	-
E. coli (CFU/mL)	-	-	-	-	0	0	0	0	-	0	-	0
Total Coliforms (CFU/mL)	-	-	-	-	140	170	2300	2433	10000	0	-	0
Arsenic (mg/l)	-	-	-	-	0	0	0	0	0.1	0.01	0.05	0.05
Barium (mg/l)	-	-	-	-	0.014	0.008	0.018	0.028	4	0.7	2	0.7
Boron (mg/l)	-	-	-	-	<0.1	<0.1	<0.1	<0.1	-	2.4	-	2.4
Total Chromium (mg/l)	-	-	-	-	≤0.002	≤0.002	≤0.002	≤0.002	-	0.05	0.1	-
Fluoride (mg/l)	-	-	-	-	0	0.06	0	0	1.5	1.5	4	1.5
Selenium (mg/l)	-	-	-	-	≤0.010	≤0.010	≤0.010	≤0.010	-	-	0.05	0.04
Uranium (mg/l)	-	-	-	-	TBA	TBA	TBA	TBA	-	0.03	0.03	0.03

TBA – The value to be available on next monitoring report. (Due to COVID-19 Pandemic, Uranium test result was not available in this report)

- Surface Water Quality Standard of Vietnam (TCVN 5942,1995)
- World Health Organization (WHO), Guidelines for Drinking-Water Quality, Fourth Edition Incorporating the First Addendum, Annex 3: Chemical summary tables.
- United States Environmental Protection Agency (EPA), National Primary Drink Water Regulations & National Secondary Drinking Water Regulation, 2009.
- *Myanmar National Drinking Water Guideline, 2019,*

According to the ECD advice, MPRL E&P prepared and comparison with Table C.3 (1) Surface Water Quality Standard of Vietnam (TCVN 5942, 1995) guideline on the limitation value of column (B). Most of the water parameters found to be within all guidelines exception for only oil and grease value. During the surface water sampling time in the river, this river level is very high, and we used a motorboat. So, some of the fuel oil spread the surface of the river. We faced this condition and cannot be avoidable.

Table C.3 (1) Surface Water Quality Standard of Vietnam (TCVN 5942, 1995)

No.	Parameter and Substance	Unit	Limitation Value	
			A	B
1	pH value	--	6 – 8.5	5.5 - 9
2	BOD_5 (20°C)	mg/l	<4	<25
3	COD	mg/l	<10	<35
4	Dissolved oxygen	mg/l	≥6	≥2
5	Suspended solids	mg/l	20	80
6	Arsenic	mg/l	0.05	0.1
7	Barium	mg/l	1	4
8	Cadmium	mg/l	0.01	0.02
9	Lead	mg/l	0.05	0.1
10	Chromium, Hexavalent	mg/l	0.05	0.05
11	Chromium, Trivalent	mg/l	0.1	1
12	Copper	mg/l	0.1	1
13	Zinc	mg/l	1	2
14	Manganese	mg/l	0.1	0.8
15	Nickel	mg/l	0.1	1
16	Iron	mg/l	1	2
17	Mercury	mg/l	0.001	0.002
18	Tin	mg/l	1	2
19	Ammonia (as N)	mg/l	0.05	1
20	Fluoride	mg/l	1	1.5
21	Nitrate (as N)	mg/l	10	15
22	Nitrite (as N)	mg/l	0.01	0.05
23	Cyanide	mg/l	0.01	0.05
24	Phenol compounds	mg/l	0.001	0.02
25	Oil and grease	mg/l	not detectable	0.3
26	Detergent	mg/l	0.5	0.5
27	Coliform	MPN/100ml	5000	10000
28	Total pesticides (except DDT)	mg/l	0.15	0.15
29	DDT	mg/l	0.01	0.01
30	Gross alpha activity	Bq/l	0.1	0.1
31	Gross beta activity	Bq/l	1.0	1.0

Note: Values in the column A are applied to the surface water using for source of domestic water supply with appropriate treatments.
Values in the column B are applied to the surface water using for the purposes other than domestic water supply. Quality criteria of water for aquatic life are specified in a separate standard.

5.4 Groundwater Quality

5.4.1 Methodology

To access groundwater quality in the Project Area, a total of four existing residential wells (dug wells and drilled/ tube wells) were sampled. The sampling locations were selected to represent the spatial extent and sensitive receivers in the residential areas of Minbu and Pwint Phyu. A total of two replicate groundwater samples were collected by Alpha horizontal water sampler at each location. Immediately after collection, the samples were transferred to labelled sample containers containing the necessary preservatives prepared by the laboratory. Samples were then stored at 4 ºC for transportation to laboratory analyses under chain-of-custody procedures. The parameters for assessing the groundwater quality are the same as those for the surface water quality monitoring in Table 11. Details of groundwater sampling location are presented in Table 12. The surrounding environment of groundwater sampling is presented in Figure 39.

5.4.2 Groundwater Sampling Locations at Mann Field

Table 12.0: Groundwater Monitoring Stations

Sampling Location	Coordinates	Description	Baseline Date	Sampling Date
Z1GW-1	20°19'40.01"N 94°49'18.27"E	Tube well in Pauk su village, Pwint Phyu Township	9 May 2015	26 July 2020
Z1GW-2	20°19'45.22"N 94°49'20.51"E	Tube well in Pauk su village, Pwint Phyu Township	9 May 2015	26 July 2020
Z2GW-1	20°15'38.43"N 94°49'59.29"E	Tube well in Kyauk san village, Minbu Township	7 May 2015	25 July 2020
Z2GW-2	20°15'39.50"N 94°50'5.51"E	Tube well in Kyauk san village, Minbu Township	7 May 2015	25 July 2020
Z3GW-1	20°15'5.35"N 94°50'54.52"E	Tube well in Kywe gya village, Minbu Township	6 May 2015	25 July 2020
Z3GW-2	20°15'6.44"N 94°50'53.77"E	Tube well in Kywe gya village, Minbu Township	6 May 2015	25 July 2020
Z4GW-2	20°11'29.50"N 94°52'27.85"E	Well in Shwe war gone ward, Minbu Township.	6 May 2015	25 July 2020

5.4.3 Groundwater Sampling Locations

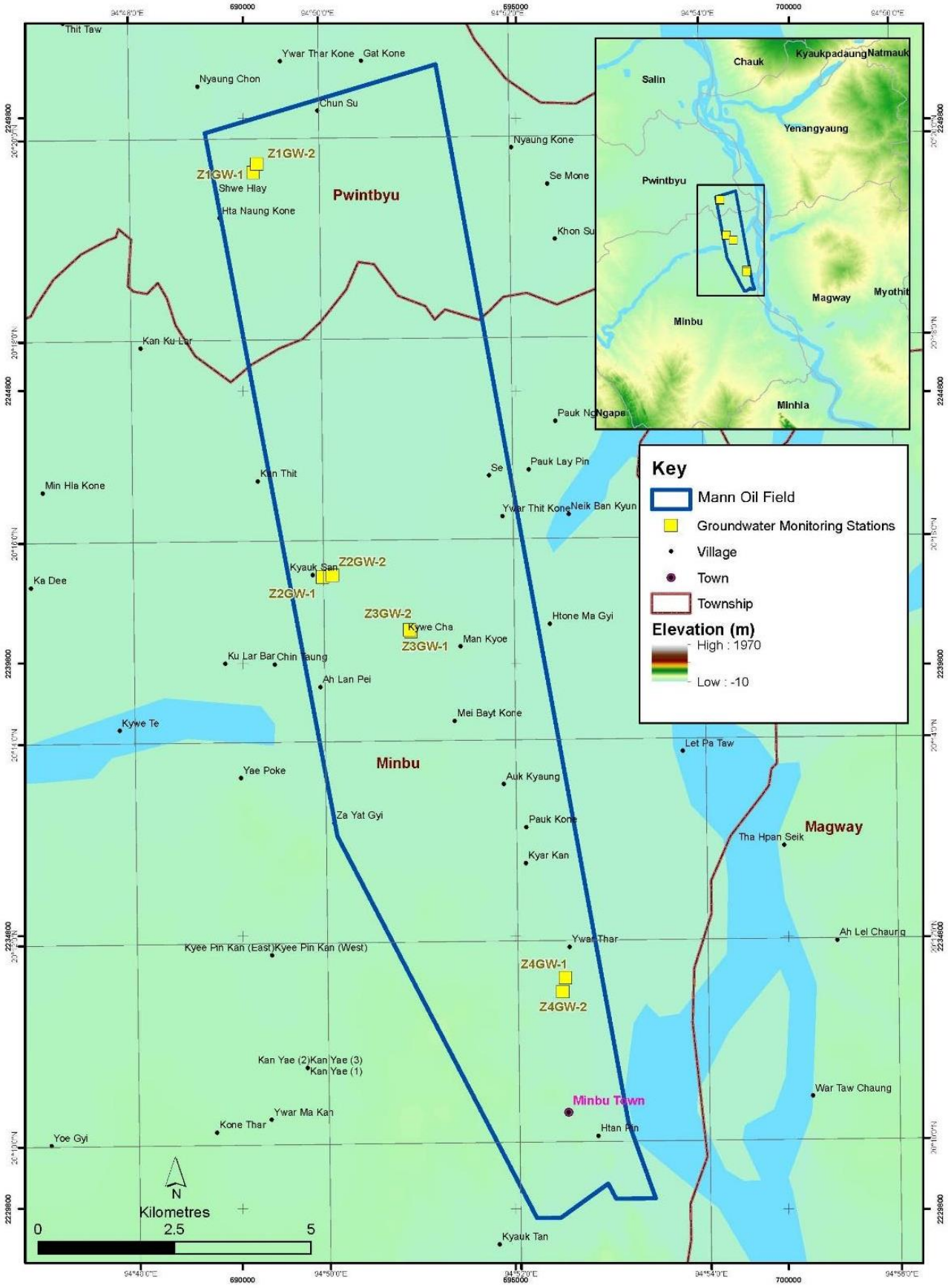


Figure 39: Surrounding Environment of Groundwater Sampling Locations

Station: Z1GW-1

Station: Z1GW-2

Station: Z2GW-1

Station: Z2GW-2

Station: Z3GW-1

Station: Z3GW-2

Station: Z4GW-2

Figure 40: Groundwater Sampling Locations (July - 2020)

(Station: Z4GW-1) Well in Shwe War Gone Ward, Minbu, and this well is not available to use in current condition due to public waste disposing to the well. As discussed with ECD (Magway) and confirmed that, it is not available to measure on this point.

A total of eight (7) groundwater sampling had conducted and mentioned the results to compare the National drinking water quality, WHO and EPA. According to the sampling results in table 11, most water parameters were within all three compared standards guidelines except Uranium is not available testing in the local lab. These parameter results will be presented in this monitoring report.

မြေအောက်ရေအရည်အသွေးတိုင်းတာခဲ့ရာတွင် E.coli နှင့် Total Coliform ပမာဏသည် NEQEG နှင့် WHO၏ သတ်မှတ်ချက် စံချိန်စံညွှန်း ထက်ကျော်လွန် နေကြောင်းတွေ့ ရှိခဲ့ရသည်။ အဆိုပါရေတွင်းများသည် စီမံကိန်းဧရိယာအတွင်း တည်ရှိနေသော်လည်း လက်ရှိလုပ်ငန်း လုပ်ကိုင်နေသော နေရာနှင့် ဆက်စပ်မှုမရှိ၊ ဝေးကွာသောနေရာတွင်တည်ရှိနေကာ၊ နေအိမ်ခြံဝန်းအတွင်းတွင်အသုံးပြုလျက်ရှိနေပြီးသောက်ရေအဖြစ်အသုံးမပြုဘဲဆေးကြောလျှော်ဖွတ်ရန်အတွက်သာ အသုံးပြုနေသော ရေတွင်း များ ဖြစ်ပါသည်။ အချို့သော ရေတွင်းများ၏ တွင်းအနက်ပေမှာ လွန်စွာတိမ်၍ မိုးတွင်းအခါများတွင် ရေတွင်းအနီးတဝိုက် ရေဝပ်လွှမ်းသည်ဟူ၍ လက်ရှိ သုံးစွဲနေသူ အိမ်ရှင်များထံမှ သိရှိခဲ့ရပါသည်။ ရံဖန်ရံခါ တွင်လည်း ရေတွင်းအတွင်းမှ၍နှင့်အမှုန်များပါလာတတ်သည်ဟု ကြားသိခဲ့ရပါသည်။ အဆိုပါအချက်များသည် E.coli နှင့် Total Coliform ပမာဏ များပြားနေရခြင်း၏ အကြောင်းအရင်း များဖြစ်ပါသည်။

5.4.4 Groundwater Quality Results

Table 13: Result Summary of Groundwater Quality Monitoring (July - 2020)

Item/Sample Name	Baseline Data Sample Locations (May-2015)				Sample Locations for Monitoring (July-2020)				WHO Standard	EPA Standard	NDWG (Myanmar) 2019
	Z1GW-1	Z1GW-2	Z2GW-1	Z2GW-2	Z1GW-1	Z1GW-2	Z2GW-1	Z2GW-2			
Date /Time	9/5/15 10:49	9/5/15 11:22	7/5/15 10:20	7/5/15 10:40	6/2/20 09:41	6/2/20 10:00	6/2/20 01:41	6/2/20 01:28			
Weather	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny			
Transparency	High	High	High	High	Medium	Medium	Medium	Medium			
Temp _Water (˚C)	28.78	30.11	33.11	35.03	28.8	29.7	32.1	34.4			
pH	6.92	6.93	6.85	7.09	7.24	7.15	7.14	7.37	6.5 – 8.5	-	6.5-8.5
DO (mg/l)	2.51	2.75	1.1	2.25	3.91	4.95	4.25	2.89	-	-	-
EC (µs)	669	778.1	1097.7	805.3	0.537	0.642	0.89	0.672	-	-	-
Turbidity (FNU)	0.5	0.3	0.2	0.1	<5	<5	<5	<5	-	-	-
Colour (HU)	Nil	10	Nil	Nil	4	29	Nil	Nil	-	-	-
Alkalinity (mg/l)	256	296	359	294	163	380	320	220	-	-	-
Hardness	281	316	130	64	250	250	210	90	-	-	-
BOD_5 (mg/l)	10	12	8	10	4.3	3.3	3.6	3.8	-	-	-
COD (mg/l)	32	32	32	32	<30	<30	<30	<30	-	-	-
Total Nitrogen (mg/l)					1.5	2.5	1.3	<0.5	-	10	-
Total Phosphorus (mg/l)	<2	4	4	<2	0.08	0.3	0.31	0.3	-	-	-
Oil and grease (mg/l)	<1	<1	<1	2	2	2	2	3	-	-	-
TSS (mg/l)	<5	<5	<5	<5	0	1	0	0	-	-	-
E. coli (CFU/mL)	-	-	-	-	40	0	0	0	0	-	0
Total Coliforms (CFU/mL)	-	-	-	-	5600	35100	246	160	0	-	0
Arsenic (mg/l)	-	-	-	-	0.01	0.005	0.01	0.005	0.01	0.05	0.05
Barium (mg/l)	-	-	-	-	0.052	0.054	≤0.002	≤0.002	0.7	2	0.7
Boron (mg/l)	-	-	-	-	<0.1	1.5	0.1	<0.1	2.4	-	2.4
Total Chromium (mg/l)	-	-	-	-	≤0.002	≤0.002	≤0.002	≤0.002	0.05	0.1	-
Fluoride (mg/l)	-	-	-	-	0.36	0.27	0.47	0.57	1.5	4	1.5
Selenium (mg/l)	-	-	-	-	≤0.010	≤0.010	≤0.010	≤0.010	-	0.05	0.04
Uranium (mg/l)	-	-	-	-	TBA	TBA	TBA	TBA	0.03	-	0.03

Information from end user, Z1GW-1 & Z1GW-2 tubes wells are use only for agriculture and general water (not for drinking water).

Note. These two tube wells are far away from the field operational area.

Table 13(A): Result Summary of Groundwater Quality Monitoring (July - 2020)

Item/Sample Name	Baseline Data Sample Locations (May-2015)				Sample Locations for Monitoring (July-2020)				WHO Standard	EPA Standard	NDWG (Myanmar) 2019
	Z3GW-1	Z3GW-2	Z4GW-1	Z4GW-2	Z3GW-1	Z3GW-2	Z4GW-1	Z4GW-2			
Date /Time	6/5/15 11:04	6/5/15 11:30	6/5/15 14:32	6/5/15 14:48	6/2/20 09:41	6/2/20 10:00	-	6/2/20 01:28			
Weather	Sunny	Sunny	Sunny	Sunny	Sunny	Sunny	-	Sunny			
Transparency	High	High	Medium	High	High	High	-	High			
Temp _Water (˚C)	36.12	35.57	31.77	31.67	38.2	34.7	-	29.0			
pH	6.68	6.63	6.95	7.22	7.58	7.32	-	7.24	6.5 – 8.5	-	6.5-8.5
DO (mg/l)	2.9	2.29	1.44	3.41	5.23	5.10	-	3.17	-	-	-
EC (µs)	1498.3	1198.7	5060.4	7740.8	2.202	0.582	-	12.21	-	-	-
Turbidity (FNU)	4.9	4.6	0.5	1	<5	<5	-	<5	-	-	-
Colour (HU)	5	10	Nil	Nil	Nil	Nil	-	Nil	-	-	-
Alkalinity (mg/l)	354	279	462	624	230	230	-	850	-	-	-
Hardness	246	222	539	639	135	125	-	925	-	-	-
BOD_5 (mg/l)	10	14	8	10	3.3	3.7	-	4.2	-	-	-
COD (mg/l)	32	32	32	32	<30	<30	-	<30	-	-	-
Total Nitrogen (mg/l)	4	73	4	63	<0.5	<0.5	-	4.1	-	10	-
Total Phosphorus (mg/l)	0.239	0.168	0.251	0.042	0.13	0.34	-	0.19	-	-	-
Oil and grease (mg/l)	<1	<1	<1	<1	2	2	-	1	-	-	-
TSS (mg/l)	<5	<5	<5	<5	0	0	-	0	-	-	-
E. coli (CFU/mL)	-	-	-	-	0	0	-	0	0	-	0
Total Coliforms (CFU/mL)	-	-	-	-	5466	12	-	4666	0	-	0
Arsenic (mg/l)	-	-	-	-	0	0	-	0	0.01	0.05	0.05
Barium (mg/l)	-	-	-	-	0.032	0.016	-	0.020	0.7	2	0.7
Boron (mg/l)	-	-	-	-	0.3	0.9	-	1.2	2.4	-	2.4
Total Chromium (mg/l)	-	-	-	-	≤0.002	≤0.002	-	≤0.002	0.05	0.1	-
Fluoride (mg/l)	-	-	-	-	0.85	0.83	-	2.0	1.5	4	1.5
Selenium (mg/l)	-	-	-	-	≤0.010	≤0.010	-	≤0.010	-	0.05	0.04
Uranium (mg/l)	-	-	-	-	TBA	TBA	-	TBA	0.03	0.03	0.03

- World Health Organization (WHO), Guidelines for Drinking-Water Quality, Fourth Edition Incorporating the First Addendum, Annex 3: Chemical summary tables.
- United States Environmental Protection Agency (EPA), National Primary Drink Water Regulations & National Secondary Drinking Water Regulation, 2009.
- *Myanmar National Drinking Water Guideline, 2019*

- Ground water monitoring (Nearby injection well 132)

Item/ Ko Win Maung (Tube Well)	Test Results	Units	NDWG (Myanmar - Draft) 2019	Remark
pH	7.4		6.5-8.5	Normal
DO	3.89	mg/l	-	-
EC	2.1	mS/cm	-	-
Turbidity	<5	FAU/ NTU	5	Normal
Colour	4	HU	15	Normal
Alkalinity	880	mg/l	-	-
Hardness	225	mg/l as CaCO3	500	Normal
BOD_5	<3	mg/l	-	-
COD	<30	mg/l	-	-
Total Nitrogen	7.7	mg/l	-	-
Total Phosphorus	<0.02	mg/l	-	-
Oil and grease	4	mg/l	-	-
TSS	1	mg/l	-	-
E. coli	-	(MPN/100 mL)	0	-
Total Coliforms	-	(MPN/100 mL)	0	-
Arsenic	0.05	mg/l	0.05	Normal
Barium	0.018	mg/l	0.7	Normal
Boron	0.9	mg/l	2.4	Normal
Total Chromium	≤0.002	mg/l	-	-
Fluoride	0.95	mg/l	1.5	Normal
Selenium	≤0.01	mg/l	0.04	Normal
Uranium	TBA	mg/l	0.03	NA

Observed that all parameter are under the NDWG guideline

Figure 41: Groundwater Testing Report (near injection Well-132)

5.5 Soil Quality

5.5.1 Methodology

The soil sampling locations were chosen as close as practicable to the existing oil wells within Mann Field. For safety reasons, underground utilities inspection was conducted at the proposed borehole location jointly with the staff from MOGE before soil sampling. Details of the monitoring location are shown in Table 12 and illustrated in Figure 42. The surrounding environment of the soil sampling stations and soil condition are shown in Table 13. These survey points were also chosen to represent baseline soil quality within the wider Mann Field area where the Project will be implemented.

5.5.2 Baseline Soil Sampling Locations

Table 14: Soil Monitoring Stations

Sampling Station	Replicate	Coordinates	Description	Baseline Sampling Date	Sampling Date
Z1S	1	20°19'45.30"N 94°49'13.99"E	At west of Pauk Su village, Pwint Phyu Township	6 – 9 May 2015	23 July 2020
	2	20°19'45.38"N 94°49'21.05"E	At Pauk Su village, Pwint Phyu Township	6 – 9 May 2015	23 July 2020
Z2S	1	20°15'41.70"N 94°50'8.41"E	In the paddy field located at the east of Kauk San village, Minbu Township	6 – 9 May 2015	24 July 2020
	2	20°15'40.05"N 94°50'10.40"E	At east of Kauk San village, Minbu Township	6 – 9 May 2015	24 July 2020
Z3S	1	20°13'22.04"N 94°51'19.59"E	In the compound of MPRL E&P office, Minbu Township	6 – 9 May 2015	22 July 2020
	2	20°13'2.60"N 94°51'14.86"E	In the compound of MPRL E&P office, Minbu Township	6 – 9 May 2015	22 July 2020
Z4S	1	20°11'41.31"N 94°52'39.20"E	Near western bank of Ayeyarwady River, north of Minbu Town	6 – 9 May 2015	22 July 2020
	2	20°11'45.77"N 94°52'38.30"E	Near western bank of Ayeyarwady River, north of Minbu Town	6 – 9 May 2015	22 July 2020

5.5.3 Location Map for Soil Monitoring

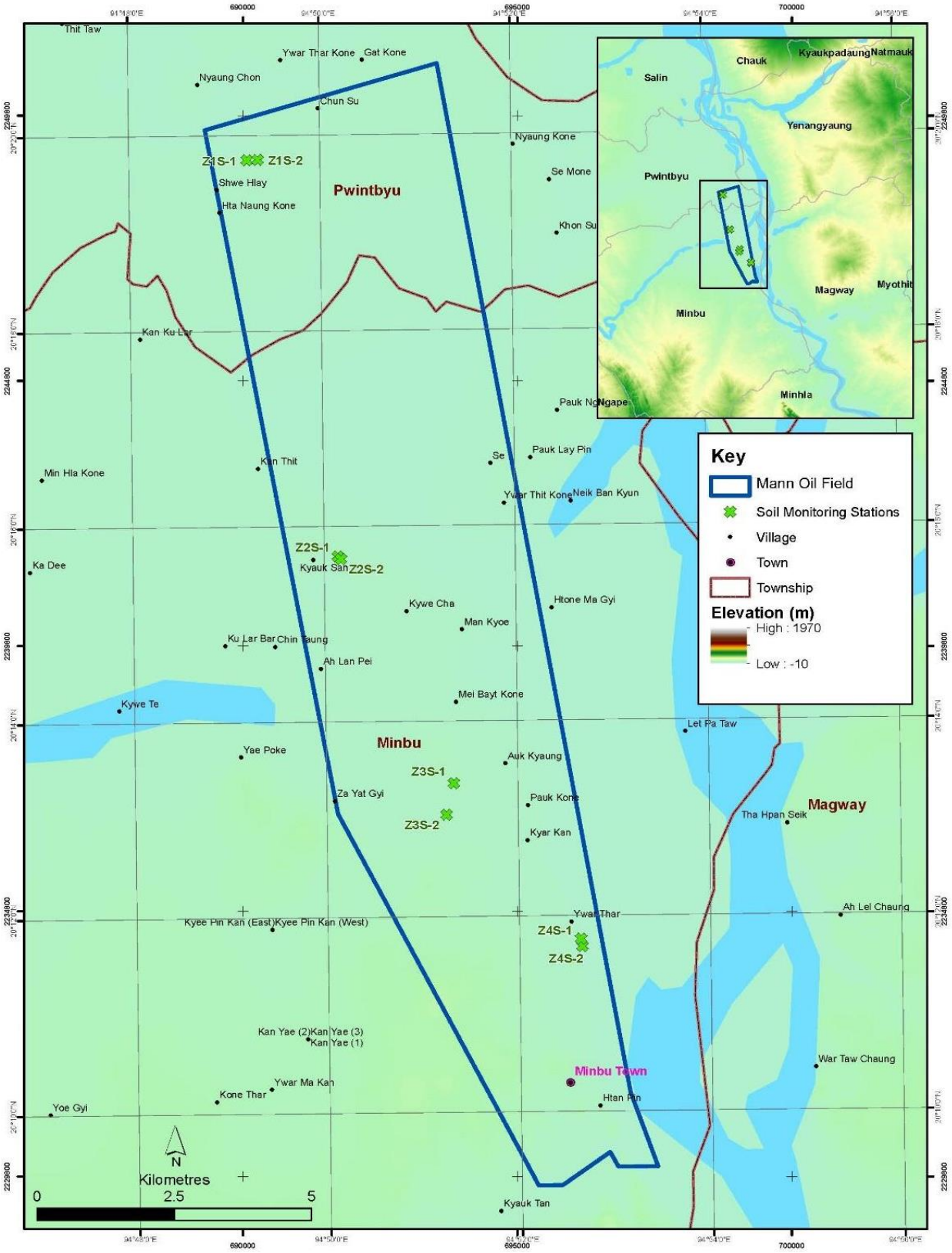


Figure 42: Locations of Soil Monitoring Stations

5.5.4 Sampling Methodology and Equipment

All soil boring/ excavation and sampling were undertaken by means of dry rotary drilling method. A total of two (2) replicate samples were collected for laboratory analyses for each sampling area. Parameters for laboratory analyses included:

- pH;
- Arsenic (As);
- Lead (Pb);
- Cadmium (Cd);
- Copper (Cu);
- Zinc (Zn);
- Manganese (Mn); and
- Iron (Fe).

In the course of the survey, sampling procedures, sample preservation and sample analysis were all recommended in the standard operating procedure of Myanmar NEQEG. In soil sampling, the standard agricultural sampler (Soil Auger) was applied. The sampler is a stainless steel tube that is sharpened on one end and fitted with a long, T-shaped handle. This tube is approximately three inches in diameter. To refrain from contamination, about 20 – 30 cm of topsoil was removed by the sampler before sampling. Then the sample was taken and collected in a clean plastic bag. Chemical preservation of samples was not applied because it is generally not recommended by the standard method. Samples were cooled in an ice box which temperature was under 4°C. Samples were protected from sunlight to minimize any potential chemical reaction. Soil texture and colour were also recorded upon sampling.

Station: Z1S-1

Station: Z1S-2

Station: Z2S-1

Station: Z2S-2

Station: Z3S-1

Station: Z3S-2

Station: Z4S-1

Station: Z4S-2

Figure 43: Soil Sampling Location (July - 2020)

5.5.5 Results Summary of Soil Quality

Table 14: Result Summary of Soil Quality Monitoring (July - 2020)

Parameter	Unit	Baseline Data Sampling Station (May-2015)								Sample Location for Monitoring Station (July - 2020)								Dutch Standard 2000
		Z1S-1	Z1S-2	Z2S-1	Z2S-2	Z3S-1	Z3S-2	Z4S-1	Z4S-2	Z1S-1	Z1S-2	Z2S-1	Z2S-2	Z3S-1	Z3S-2	Z4S-1	Z4S-2	
pH	-	6.8	6.8	6.7	6.7	6.8	6.8	6.9	6.9	7.3	7.6	7.9	7.6	7.2	7.1	6.6	7.2	—
Arsenic	mg/kg	ND	ND	ND	ND	ND	ND	ND	ND	<0.005	<0.005	<0.005	<0.005	0.02	0.03	<0.005	<0.005	55
Lead	mg/kg	115	120	135	130	120	124	137	135	<5	<5	5	<5	<5	<5	5	5	530
Cadmium	mg/kg	0.009	0.008	0.009	0.007	0.007	0.007	0.006	0.007	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	12
Copper	mg/kg	105	99	110	115	90	95	85	88	5	5	1.5	1	4.5	5	5	10	190
Zinc	mg/kg	75	80	72	69	65	70	75	78	85.84	101.70	72.65	73.67	34.69	22.00	61.31	66.30	720
Manganese	mg/kg	30	32	38	35	28	25	31	30	0.07	0.07	0.06	0.06	0.05	0.04	0.06	0.06	—
Iron	mg/kg	4850	4790	4900	4930	4870	4950	4700	4690	6.87	6.87	6.89	6.98	3.96	3.96	7.99	7.89	—
Soil Texture	-	Silty clay	Silty clay	Silty sand	Silty sand	Silty sand	Silty sand	Sandy silt with minor clay	Sandy silt with minor clay	-	-	-	-	-	-	-	-	—
Soil Color	-	Grey	Grey	Yellowish brown	Yellowish brown	Yellowish brown	Yellowish brown	Yellowish grey	Yellowish grey	-	-	-	-	-	-	-	-	—

Note: In general, the soil in the sampling locations is sandy and was previously disturbed by agricultural activities. As there is no relevant national guideline or IFC standard to assess the soil quality, the Dutch Standard 2000 is adopted for evaluation, and all the measured parameters meet the assessment criteria.

N.D. = Not Detected

6.0 Monitoring for Discharge of Treated Wastewater and Runoff

6.1 Base Camp Water Discharge

Domestic-type wastewater and sewage are under managing in the existing operational phase. Based on the camp water consumption monitoring results, the sewage and wastewater generation rate is up to about 10,000 liters per day of sanitary wastewater generated from the base camp within the Mann Field which can accommodate 140 workers.

Water consumption is monitored by using the water flow meter in the base camp, workshop, warehouse, and downhole workshop. In the meantime, the team is fully aware of the consumption of water to reduce the volume of water consumption.

Figure 44: Monitoring with Water Flow Meter

Sanitary wastewater and domestic wastewater are implemented as per the mitigation plan.

- Sanitary wastewater is collected in the septic holding tanks in the main camp and a retained licensed firm periodically cleans and services the septic holding tanks. Currently sanitary wastewater is collected in the concrete pit and there is no discharge outside.
- MPRL E&P was installed the waste water treatment unit to treat sanitary wastewater properly to meet NEQEG guideline. Field team is implementing to monitor the discharge water parameter quarterly basics.
- Storm water run-off is routed to a pond to remove silt particles before discharge via storm drain.
- Surface runoff from potential sources of contamination prevented.

- All drainage facilities and sediment control structures inspected on a regular basis and maintained to confirm proper and efficient operation at all times and particularly during rainstorms. Deposited silt and grit removed regularly.
- Runoff from areas without potential sources of contamination minimized (e.g. by minimizing the area of impermeable surfaces) and the peak discharge rate will be reduced (e.g. by using vegetated swales and retention ponds).
- Oil water separators and grease traps have been constructed and maintained as appropriate at refueling facilities, workshops, parking areas, fuel storage and containment areas.
- The discharge point of treated sewage effluent to surface water (location not confirmed based on existing project design) will be located where there is adequate assimilative capacity of the surface waters.

Figure 45: Sewage System in Base Camp

Figure 46: Bio-Filtration Unit

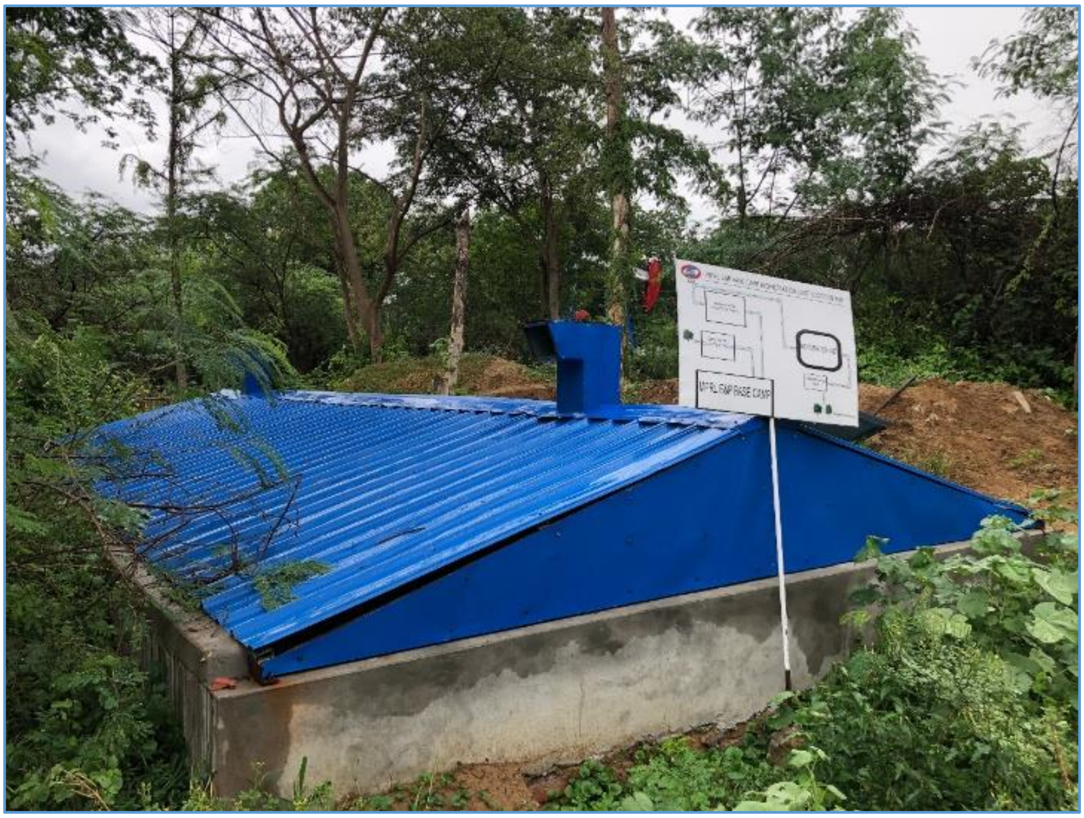
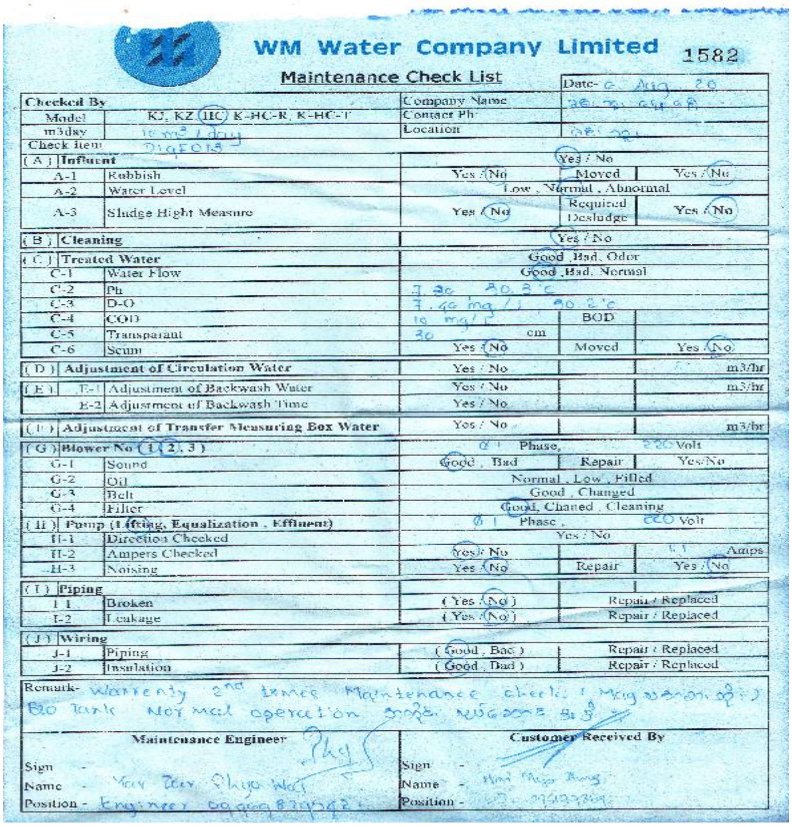


Figure 47: Storage Concrete pit



WM Water Company Limited 1582

Maintenance Check List

Checked By		Company Name	Date- 6 Aug 20	
Model	KJ, KZ, HC, K-HC-R, K-HC-T	Contact Ph:		
m3day	10 m3 / day	Location		
Check Item	D19F013			
(A)	Influent		Yes / No	
A-1	Rubbish	Yes / No	Moved	Yes / No
A-2	Water Level	Low , Normal , Abnormal		
A-3	Sludge Hight Measure	Yes / No	Required Desludge	Yes / No
(B)	Cleaning		Yes / No	
(C)	Treated Water	Good ,Bad, Odor		
C-1	Water Flow	Good ,Bad, Normal		
C-2	Ph	7.30 30.3 °c		
C-3	D-O	7.40 mg / l 30.2 °c		
C-4	COD	10 mg/ l	BOD	
C-5	Transparant	30 cm		
C-6	Scum	Yes / No	Moved	Yes / No
(D)	Adjustment of Circulation Water	Yes / No		m3/hr
(E) E-1	Adjustment of Backwash Water	Yes / No		m3/hr
E-2	Adjustment of Backwash Time	Yes / No		
(F)	Adjustment of Transfer Measuring Box Water	Yes / No		m3/hr
(G)	Blower No (1, 2, 3)	Ø 1 Phase,	220 Volt	
G-1	Sound	Good , Bad	Repair	Yes/No
G-2	Oil	Normal , Low , Filled		
G-3	Belt	Good , Changed		
G-4	Filter	Good, Chaned , Cleaning		
(H)	Pump (Lifting, Equalization , Effluent)	Ø 1 Phase ,	220 Volt	
H-1	Direction Checked	Yes / No		
H-2	Ampers Checked	Yes / No		Amps
H-3	Noising	Yes / No	Repair	Yes / No
(I)	Piping			
I-1	Broken	(Yes / No)	Repair / Replaced	
I-2	Leakage	(Yes / No)	Repair / Replaced	
(J)	Wiring			
J-1	Piping	(Good , Bad)	Repair / Replaced	
J-2	Insulation	(Good , Bad)	Repair / Replaced	

Remark- Warrenty 2nd times Maintenance check ! ...
Bio Tank Normal operation ...

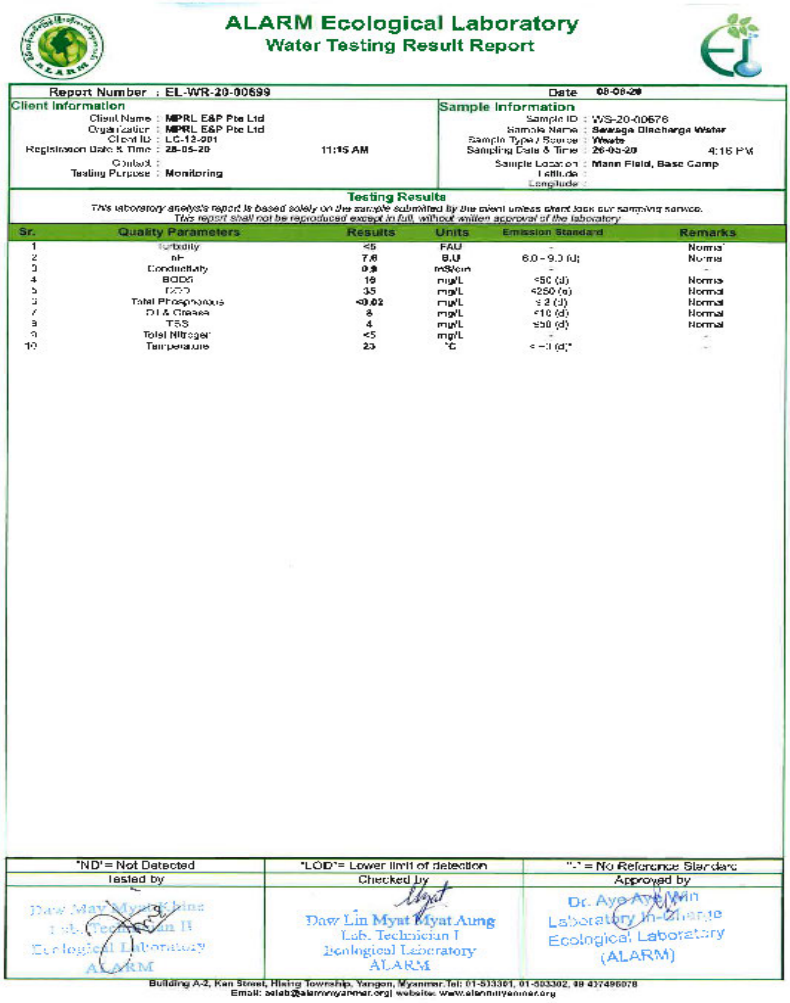
Maintenance Engineer	Customer Received By
Sign -	Sign -
Name - Yair Zar Phyo Wai	Name -
Position - Engineer	Position -

Figure 48: Discharge Waste Water (Sewage) Test Report (Base Camp)

Performing maintenance and inspection for Bio filtration unit by authorized person from WM Water Company.

Sr.	Analysis	Results	Units	NEQEG Guideline	Remarks
1	pH	7.6	S.U	6.0 ~ 9.0	Normal
2	Temperature	23.0	˚C		
3	Total Suspended Solids	4	mg/l	50	Normal
4	BOD_5	16	mg/l	30	Normal
5	COD	35	mg/l	125	Normal
6	Total Phosphorus	<0.02	mg/l	2	Normal
7	Oil and Grease	8	mg/l	10	Normal
8	Total Nitrogen	<5	mg/l	10	Normal-
9	Turbidity	<5	FAU	-	
10	Electrical Conductivity (EC)	0.9	mS/cm	-	
11	Total Coliform Bacteria	-		400	

Figure 49: Discharge Waste Water (Sewage) Test Parameters



ALARM Ecological Laboratory
Water Testing Result Report

Report Number : EL-WR-20-00699 Date : 08-09-20

Client Information
Client Name : MPRL E&P Pte Ltd
Organization : MPRL E&P Pte Ltd
Client ID : LC-12-001
Registration Date & Time : 28-05-20 11:15 AM
Contact :
Testing Purpose : Monitoring

Sample Information
Sample ID : WS-20-00676
Sample Name : Sewage Discharge Water
Sample Type / Source : Waste
Sampling Date & Time : 26-05-20 4:15 PM
Sample Location : Mann Field, Base Camp
Latitude :
Longitude :

Testing Results

This laboratory analyst's 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	Emission Standard	Remarks
1	Turbidity	<5	FAU	-	Normal
2	pH	7.6	S.U	6.0 - 9.0 (d)	Normal
3	Conductivity	0.9	mS/cm	-	-
4	BOD5	18	mg/L	<50 (d)	Normal
5	COD	35	mg/L	<250 (e)	Normal
6	Total Phosphorous	<0.02	mg/L	≤ 2 (d)	Normal
7	Oil & Grease	8	mg/L	<10 (d)	Normal
8	TSS	4	mg/L	≤50 (d)	Normal
9	Total Nitrogen	<5	mg/L	-	-
10	Temperature	29	°C	< +3 (d)*	-

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

Tested by: Daw May Myint Khine, Lab. Technician II, Ecological Laboratory, ALARM

Checked by: Daw Lin Myat Myat Aung, Lab. Technician I, Ecological Laboratory, ALARM

Approved by: Dr. Aye Aye Min, Laboratory In-Charge, Ecological Laboratory (ALARM)

Building A-2, Kan Street, Hlaing Township, Yangon, Myanmar. Tel: 01-513301, 01-513302, 09 457496078
Email: [illegible] website: www.alarmmyanmar.org

Figure 50: Sewage Discharge Water Monitoring Results (Base Camp)

Figure 51: Monitor Waste Water Discharge Parameters

6.2 Hydro test water

In Mann field warehouse, team used to perform the hydro test for the tubing in the designated pressure test area. Field team reduced and minimized the usage of water volume by using recycled water with zero discharge.

Figure 52: Recycle Water Usage System with Zero Discharge

Figure 53: Recycle Water Back to Main Storage Concrete Pit

ALARM Ecological Laboratory
Water Testing Result Report

Report Number	: EL-WR-20-00701	**Date**	: 05-06-20

Client Information

Client Name	: MPRL E&P Pte Ltd		
Organization	: MPRL E&P Pte Ltd		
Client ID	: LC-12-001		
Registration Date & Time	: 28-05-20	11:15 AM	
Contact	:		
Testing Purpose	: Monitoring		

Sample Information

Sample ID	: WS-20-005/S		
Sample Name	: Hydro Test Water		
Sample Type / Source	: Hydro Test Water		
Sampling Date & Time	: 26-05-20	4:56 PM	
Sample Location	: Warehouse		
Latitude	:		
Longitude	:		

Testing Results

The 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	Emission Standard	Remarks
1	Turbidity	18	FAU	-	-
2	pH	7.2	S.U	6.0 - 9.0 (c)	Normal
3	Conductivity	0.69	mS/cm	-	-
4	BOD5	3.1	mg/L	≤50 (d)	Normal
5	COD	<30	mg/L	≤250 (d)	Normal
6	Oil & Grease	4	mg/L	≤10 (d)	Normal
7	TSS	19	mg/L	≤50 (d)	Normal
8	Arsenic	0	mg/L	≤0.1 (d)	Normal
9	Chloride	46	mg/L	-	-
10	Cadmium	ND	mg/L	≤0.1 (d)	LOD=0.01
11	Chromium (Hexavalent)	0	mg/L	≤0.1 (d)	Normal
12	Copper	ND	mg/L	≤0.5 (d)	LOD=0.02
13	Lead	ND	mg/L	≤0.1 (d)	LOD=0.1
14	Nickel	<0.2	mg/L	≤0.5 (d)	Normal
15	Zinc	0.08	mg/L	<2 (c)	Normal
16	Phenol	<0.1	mg/L	≤0.5 (d)	Normal
17	Sulfide	<0.04	mg/L	<1 (c)	Normal
18	Total Nitrogen	<5	mg/L	-	-

"ND"= Not Detected	"LOD"= Lower limit of detection	"-" = No Reference Standard
Tested by	Checked by	Approved by
Daw Mya Mya Khine Lab. Technician I Ecological Laboratory ALARM	Daw Lin Myat Myat Aung Lab. Technician I Ecological Laboratory ALARM	Dr. Aye Aye Wan Laboratory In-Charge Ecological Laboratory (ALARM)

Building A-2, Kan Street, Hlaing Township, Yangon, Myanmar. Tel: 01-503361, 01-583302, 09 437456078
Email: eslab@alarmmyanmar.org | website: www.alarmmyanmar.org

Figure 54: Hydro test Water Testing Results Monitoring at Zero Discharge

Sr.	Parameters	Testing Results	Units	NEQEG Guideline Value	Remarks
1	BOD_5	3.1	mg/l	25	Normal
2	COD	<30	mg/l	125	
3	Chloride	46	mg/l	600~1200	Normal
4	Heavy metals (total) (Iron, Aluminium, Manganese, Arsenic, Nickel, Lead and Copper)	0.28	mg/l	5	Normal
5	pH	7.2	S.U	6~9	Normal
6	Phenols	<0.1	mg/l	0.5	Normal
7	Sulfides	<0.04	mg/l	1	Normal
8	Total hydrocarbon content	-	mg/l	10	Normal
9	Total suspended solids	19	mg/l	35	Normal

Figure 55: Hydro test Water Testing Monitoring at Zero Discharge

6.3 Use of Chemicals for EOR

During the EOR operation, chemicals will be injected into the wells to alter the property of oil for enhanced recovery in the EIA report. The chemicals that may be used for the Project included alkaline and polymers. The injection of chemicals into the well may cause groundwater contamination and indirectly affecting community health.

In Mann Field, MPRL E&P applied the GreenZyme® to inject to the formation that does not expose nor discharge to the environment. There is no environmental issue since the injection project had been conducted according to the standard operating procedure by protecting any spill to the environment. According to the work program, MPRL E&P did not conduct the GreenZyme® treatment operation during early six months of this fiscal year 2020-21 and observing the result of previous year GreenZyme® treatment wells' result.

GreenZyme® is not a chemical but a biological liquid enzyme which is a kind of environmentally friendly fluid. It is a protein-based non-living catalyst, which facilitates the completion of biological reactions, to enhance crude oil recovery from most oil wells, both onshore and offshore. EOR GreenZyme® is produced by a proprietary process, which involves impregnating a high protein nutrient soup, with the DNA of selectively cultured microbes. The final product contains enzymes associated with the oil-eating microbe's DNA. Nearly all-living microbes are made inert at the end of the manufacturing process.

6.4 Produced Water Management

The ultimate goal of MPRL E&P to minimize environmental impact is Zero Discharge in produced water management. It is not an easy task to fulfil the target and eventually it took quite a long time more than five years. However, MPRL E&P is really initiative in order to implement environmental management plan among other onshore fields. The team recorded milestones on achievements such as fabricating and renovating all gas & oil collection stations GOCS's, constructing waste management compound, cellar renovation and constructing double cellars at individual well sites, composting food waste, segregation of general waste, sludge management, drilling cuttings management, produce water management etc. For this progress efforts, MPRL E&P proudly brings up that the mile stone of Zero Discharge on produced water management was implemented on 24 August 2017.
After achieving the zero discharge target, MPRL E&P started considering to extend the concept to handle produced water efficiently and effectively, that is, trying to switch from the disposal to injection all produced water in order to maximize the recoverable of reserve oil by the reservoir energy support. Reference to the operation activities, the five injection pumps are successfully injecting all volume of produced water (1400 bbl +/-) to the dedicated wells in the mid of 2019.

MPRL E&P is undertaking to inject all produced water (100%) to the shut-in wells by using **5** units of injection pumps to meet guideline levels in NEQEG for Onshore Oil and Gas Development.

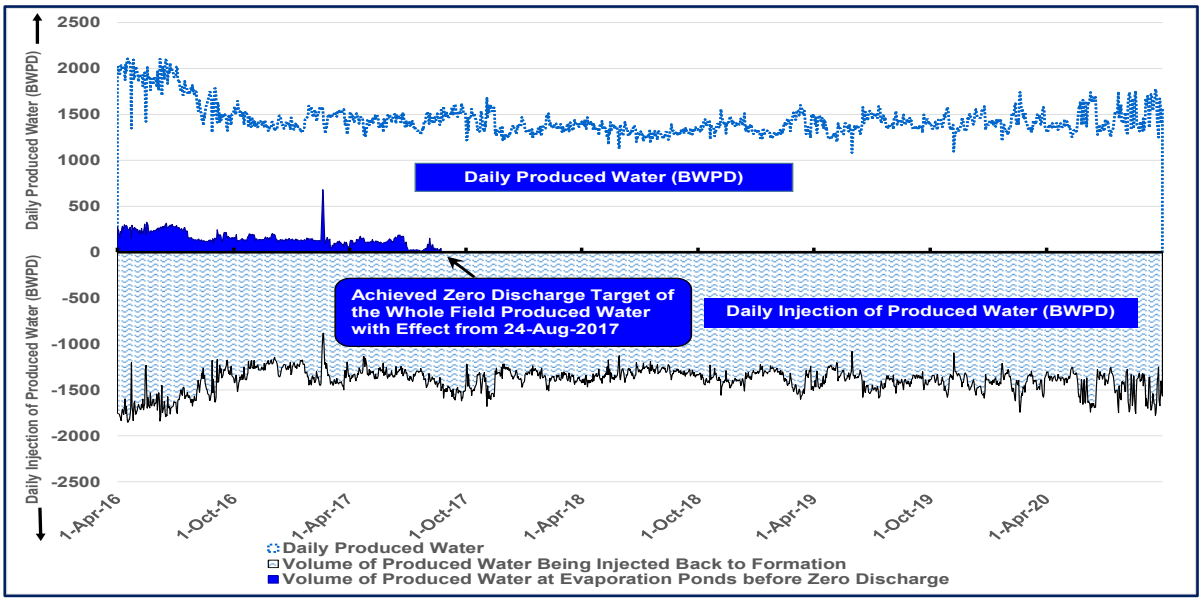


Figure 56: Produced Water Management

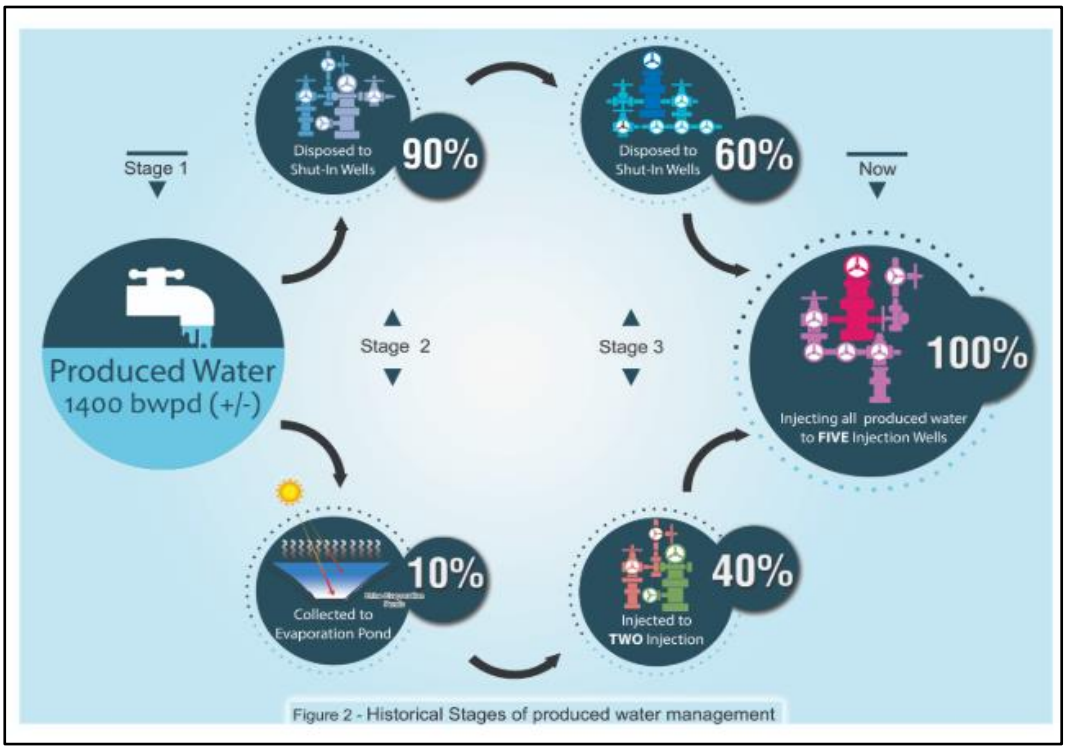


Figure 57: Process of Injection Well for Produced Water

Figure 58: Produced Water Injection Pump

As per the table 8.3 Environmental And Social Monitoring Program of the approved EIA report, it is committed to test the waste waters from the discharged points. However, all the produced water from the GOCs are being disposed back into the formation and thus there is no discharged to the environment. Again, there is no discharge from the hydro test activities and also from shut in wells.

Therefore, waste water monitoring will be continued with the parameters committed in table 8.3 of the approved EIA report on the treated discharged water of the base camp.

6.5 Monitoring for Solid Waste (Sludge Management)

Produced water generated from everyday production about +/- 1400 BBL per day in the Mann Field. Produced water typically contains a mixture of inorganic (dissolved salts, trace metals, suspended particles) and organic (dispersed and dissolved hydrocarbons, organic acids) compounds. Produced water generates sludge due to the compound sediments, and improper discharge sludge may cause potential impacts on the receiving environment (i.e. soil, surface water, and groundwater) and community health as well as terrestrial and aquatic ecological resources.

Dried sludge, 40 Ton (estimated weight) are temporary storage at Waste Management Compound and we have planned to construct the temp storage area in the Sludge management compound and also will perform a pilot test with Bioremediation process. Currently, all sludge is proper storage in concrete pits.

Figure 59: Dry Sludge Storage Area (Waste Management Compound)

Figure 60: Sludge Management Compound

All sludge collected are in proper storage in concrete pits to meet the guideline levels in NEQEG for Onshore Oil and Gas Development.

7.0 Gas Venting Monitoring

As per the gas venting monitoring program, MPRL E&P's technical team is monitoring and measuring by using an Echo Meter to check for gas volume. Based on the results, if the gas volume is significantly higher than the previous measurement volume, use the orifice meter to confirm the gas volume measured by 24 hours. The team connected to the gas line after confirming gas volume is enough to collect to the existing facility of the gas supply lines to the LPG plant.

As per the planned monitoring program, the team randomly selected the six wells and measured by using an orifice meter on the wells as follows;

7.1 Location of the gas venting wells

Table 15: Gas venting well locations

Well No	Location	Gas Volume	Date
M 240	N 20°13'18.51" E 94°51'18.88"	0 – MMCFD	10 Mar 2020
M 321	N 20°13'21.65" E 94°51'17.54"	0 – MMCFD	7 Apr 2020
M 410	N 20°13'34.40" E 94°51'19.53"	0 – MMCFD	13 May 2020
M 493	N 20°13'47.04" E 94°50'59.93"	0 – MMCFD	17 Jun 2020
M 289	N 20°13'32.92" E 94°51'15.54"	0 – MMCFD	21 Jul 2020
M 484	N 20°13'33.34" E 94°51'16.34"	0 – MMCFD	06 Aug 2020

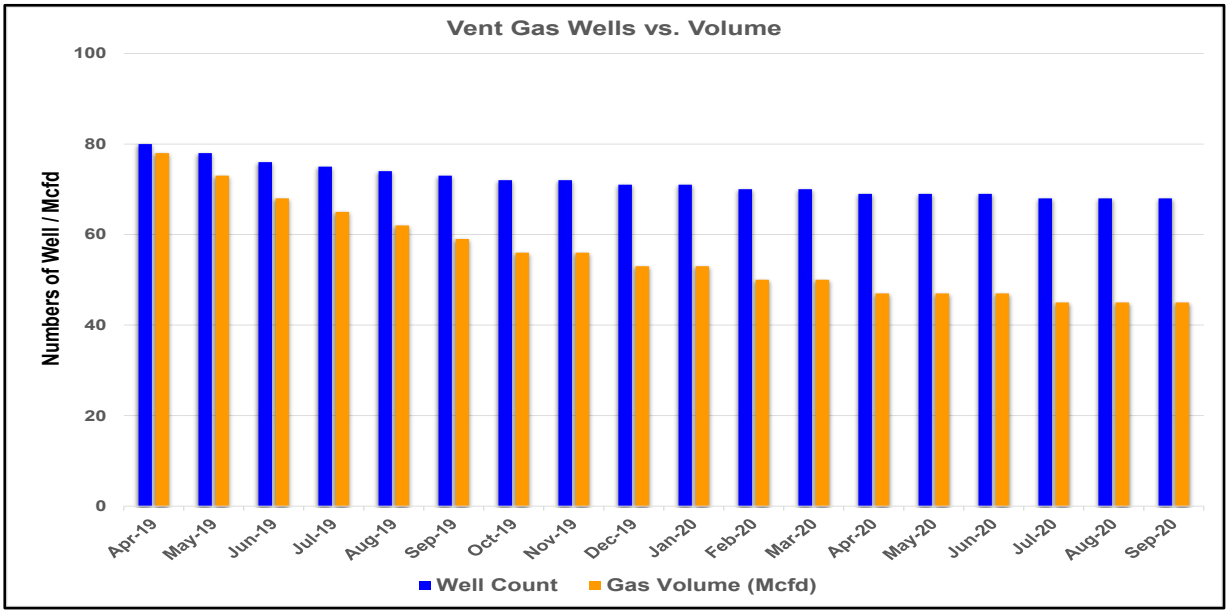


Figure 61: Gas-vented wells and vented gas volume measurement record

Gas Volume Measurement (Orifice Meter) Well- 240

Date : 10 March 2020, Gas Volume – 0 MMCFD

Gas Volume Measurement (Orifice Meter) Well- 321

Date : 7 April 2020, Gas Volume – 0 MMCFD

Gas Volume Measurement (Orifice Meter) Well- 410

Date : 13 May 2020, Gas Volume – 0 MMCFD

Gas Volume Measurement (Orifice Meter) Well- 493

Date : 17 June 2020, Gas Volume – 0 MMCFD

Gas Volume Measurement (Orifice Meter) Well- 289

Date : 21 July 2020, Gas Volume – 0 MMCFD

Gas Volume Measurement (Orifice Meter) Well- 484

Date : 6 Aug 2020, Gas Volume – 0 MMCFD

Figure 62: Gas Meter Flow Charts

7.2 Monitoring for Hydrogen Sulphide (H_2S)

Table 16: H_2S Monitoring Location

Sr. No:	Well No.	Date	Measurement Time	H_2S (PPM)	CO (PPM)	O_2 (%)	LEL (%)
1	M-52	04-Aug-20	9:40	0	0	20.9	0
2	M-413	04-Aug-20	9:00	0	0	20.3	0
3	M-61	04-Aug-20	14:40	0	0	20.9	0
4	M-356	04-Aug-20	10:00	0	0	20.9	0
5	M-368	04-Aug-20	15:20	0	0	20.3	0
6	M-508	04-Aug-20	16:00	0	0	20.7	0
7	M-98	04-Aug-20	10:13	0	0	20.9	0
8	M-300	04-Aug-20	14:50	0	0	20.9	0

Measurement duration – 30 second / Guideline Value – Hydrogen Sulphide 5 mg/ Nm^3 c

Figure 63: H_2S Monitoring Wells

As per the reservoir nature, the gas volume will be slightly going down however there is a significant increase of gas volume after perforation the well # 657. However team is continually monitoring the gas volume by using the Echo meter for every vent well, which will measure the orifice meter and collect to the LPG supply lines if currently there is no additional impact due to gas venting and H_2S to the environment.

8.0 Occupational Health and Safety & Environmental Summary

As per the set proactive measures in the HSE management system, MPRL E&P has achieved a total of 1068.5 training man-hours within the past six-month period, April to September 2020. The HSE department focused and delivered topics such as heat stress management, Covid-19 Prevention Plan and Procedures as per MoHS guidelines, Defensive Driving Techniques, Back Safety Prevention Techniques, Environmental Awareness, and Incident Investigation Methodology as planned in the HSE annual training plan for the fiscal year 2020-2021. The said training not only intended for the field crews i.e. MOGE and MPRL E&P but also delivered to Heads of Department from MOGE. Moreover, the HSE department conducted a series of NEBOSH IGC training to all HSE personnel and field supervisors to enhance their Health and Safety competence and to promote their awareness levels.

Along with the trainings, the HSE department coordinated with the field management team to ensure the company's emergency response plan (ERP) is effective and all crews are fully aware of their roles and responsibilities during any type of emergency by conducting emergency drill as per planned schedule. In August 2020, an oil spill drill was conducted by liaison with MOGE.

The HSE department also fulfilled several site audits and inspections to ensure all operational activities and assets are aligned with company's HSE standards, requirements, and expectations. A total of 596 number of inspections and audits had been achieved.

Reviewing the company's HSE performance from reactive measures, MPRL E&P had 9 recordable cases in the last six-month period. This includes one high potential near miss case, two-property damage cases which do not have a significant impact to the business, three environmental incidents .i.e. oil spillages, one fire incident case which is non-operational related case, one medical treatment case of a MOGE crew and a permanent partial disability case of a MOGE crew. As a normal practice of MPRL E&P, a thorough investigation is conducted after the occurrence of each incident, root causes, and all the contributing factors are revealed to prevent recurrences in the future. From the incident investigation reports, the lessons learned can be summarized as follows:

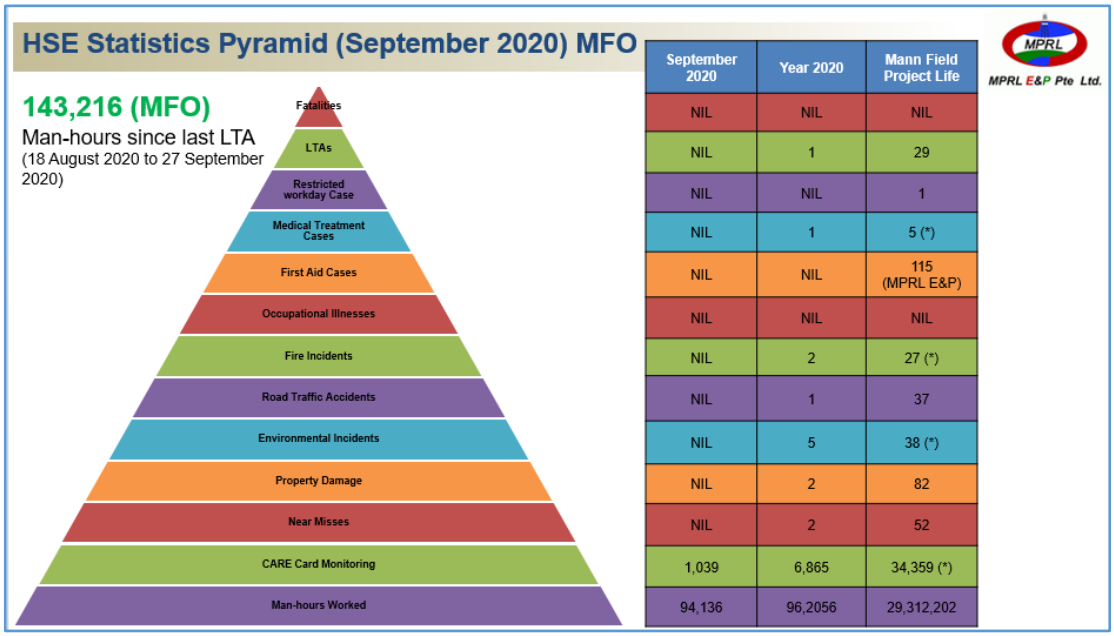
- Every electrical installation must be made as per industrial standard practices
- Situational risks assessment to be practiced by field crews more effectively
- Assets integrity and its failures to be more focused with effective inspection, preventive and maintenance to protect environmental incidents and injury-related incidents
- Field security management to be strengthened by the MOGE
- Standard operation procedures to be reviewed and revised then related JSAs to mention specific associated risks in detail with adequate control measures

During these six months, business sustainability against COVID-19 pandemic becomes one of the utmost priorities for the HSE department. Therefore, developing work from home procedures, return to work procedures, compliance towards MoHS guidelines at workplaces, both at Yangon Office and Mann Field and the disinfection activities by using third party specialist and monitoring its effectives become the key activities of the HSE department along with the outbreak.

In conclusion, the HSE department is now focusing the way forward plans to cope with the pandemic situation as follows:

- HSE training will be conducted by delivering online such as Microsoft Team Meet.
- Tabletop exercises will be an alternative If emergency drills are inappropriate to be physically conducted.
- All the HSE related meetings will be ongoing via online.
- Remote audit will be exercised if the transportations are suspended and physical site audits cannot be implemented.

- To keep in touch with MoHS updated information and monitoring the situational changes and act upon.
- Support the filed management team for crew change management as required.



	September 2020	Year 2020	Mann Field Project Life
Fatalities	NIL	NIL	NIL
LTAs	NIL	1	29
Restricted workday Case	NIL	NIL	1
Medical Treatment Cases	NIL	1	5 (*)
First Aid Cases	NIL	NIL	115 (MPRL E&P)
Occupational Illnesses	NIL	NIL	NIL
Fire Incidents	NIL	2	27 (*)
Road Traffic Accidents	NIL	1	37
Environmental Incidents	NIL	5	38 (*)
Property Damage	NIL	2	82
Near Misses	NIL	2	52
CARE Card Monitoring	1,039	6,865	34,359 (*)
Man-hours Worked	94,136	96,2056	29,312,202

Figure 64: HSE Statistics Pyramid

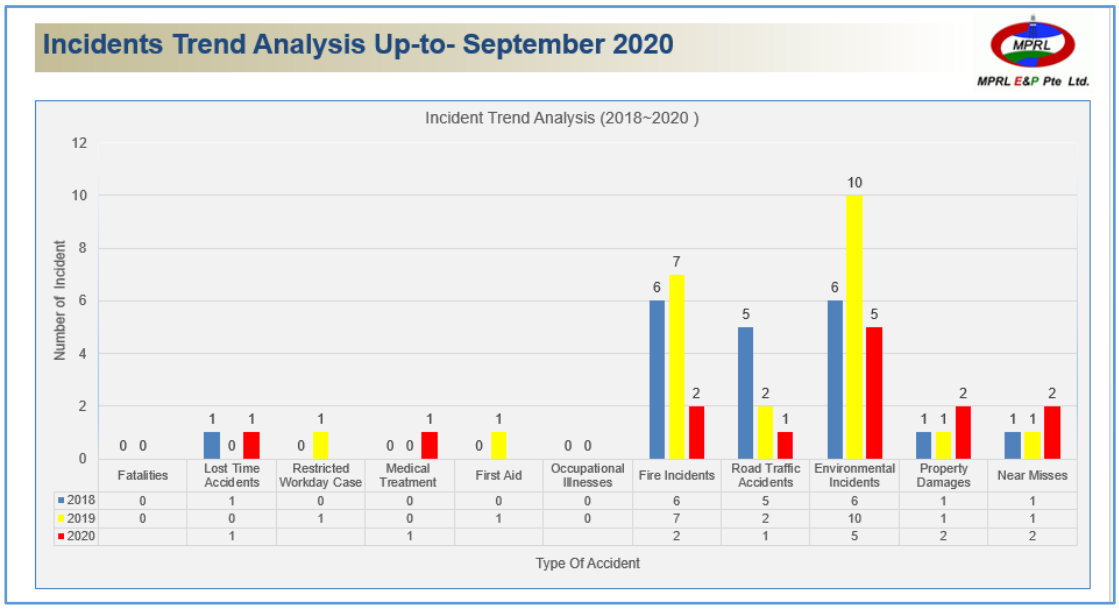


Figure 65: Incident Trend Analysis

8.1 HSE Training

As a part of promoting safety culture at all levels of organization, HSE team conducted the following trainings:

- COVID-19 Prevention Awareness training
- Firefighting training
- Heat Stress Awareness Campaign
- Environmental Awareness Training
- Return to Work Awareness Training
- NEBOSH (IGC1) Level3 internal capacity building Training
- Back Safety
- Incident Investigation Awareness Training
- OHS Policy & Environmental Policy Awareness Training


MECHANICAL WORKSHOP


WORKSHOP
FIELD

Figure 66: HSE Training Photos

8.2 HSE Audit

HSE bi-annual Audit for fiscal year of 2019-20 was conducted from 24th to 26th of February 2020, to determine the level of health and safety performance in Mann Field operation against the criteria as mentioned in the MPRL E&P approved procedures, MRPL E&P HSEMS and international best practices.

The audit includes the following activities:

1. Reviewing Standard Operating Procedures & JSAs
2. Sampling interviews of field personnel against set SOPs & JSAs
3. Reviewing the effectiveness in the implementation on previous HSE audit findings
4. Searching potential hazards onsite for both obvious and hidden gaps and substandard practices
5. Reviewing HSE documentation system.
6. Reviewing Preventive & Maintenance Program (Plan Vs Actual)

The primary objective of the audit is to achieve continuous improvements in HSE management system to ensure the worksite continues to provide a safe and healthy

environment for staff, members of the surrounding community and also sustainability to the environment.

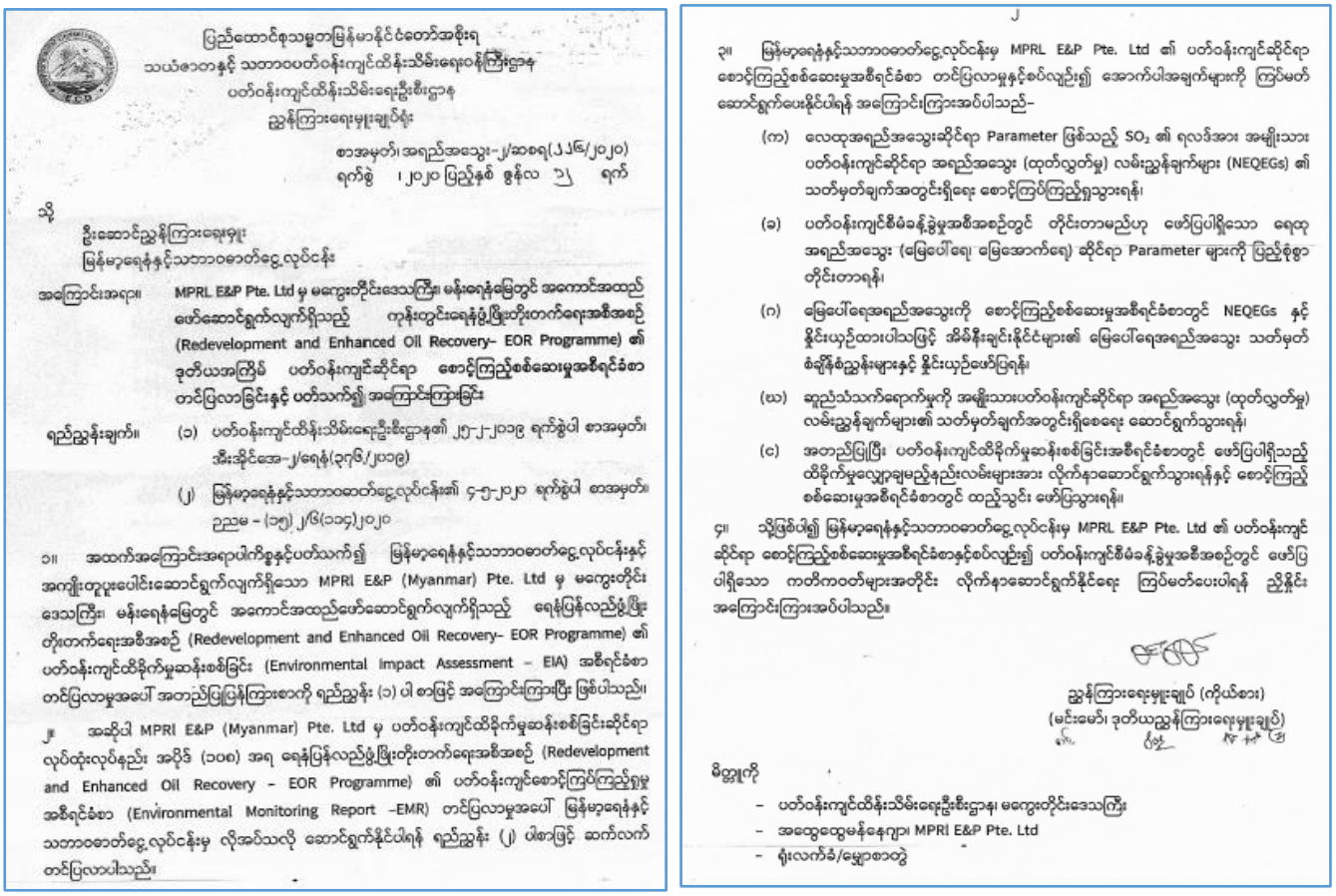
This report presents the findings and recommendations for the Mann Oil Field as following order:

1. Updating the progress of action taken on previous audit findings
2. Outstanding previous audit finding
3. Highlighting the improved areas
4. New findings for future improvement
5. Review of Mann Field HSE documentation
6. Review of Preventive & Maintenance Program
7. Outcome of staff interview
8. Conclusion

Figure 67: HSE Team site audit photos

Figure 68: HSE Inspection at crew change bus

8.3 Implementation of ECD Comments



ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ
သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာန
ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန
ညွှန်ကြားရေးမှူးချုပ်ရုံး

စာအမှတ်၊ အရည်အသွေး-၂/ဆစရ(၂၂၆/၂၀၂၀)
ရက်စွဲ ၊ ၂၀၂၀ ပြည့်နှစ် ဇွန်လ ၁၂ ရက်

သို့
ဦးဆောင်ညွှန်ကြားရေးမှူး
မြန်မာ့ရေနံနှင့်သဘာဝဓာတ်ငွေ့လုပ်ငန်း

အကြောင်းအရာ။ MPRL E&P Pte. Ltd မှ မကွေးတိုင်းဒေသကြီး၊ မန်းဆရံမြေတွင် အကောင်အထည်ဖော်ဆောင်ရွက်လျက်ရှိသည့် ကုန်းတွင်းရေနံပွဲ့ဖြိုးတိုးတက်ရေးအစီအစဉ် (Redevelopment and Enhanced Oil Recovery- EOR Programme) ၏ ဒုတိယအကြိမ် ပတ်ဝန်းကျင်ဆိုင်ရာ စောင့်ကြည့်စစ်ဆေးမှုအစီရင်ခံစာ တင်ပြလာခြင်းနှင့် ပတ်သက်၍ အကြောင်းကြားခြင်း

ရည်ညွှန်းချက်။ (၁) ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာနှ၏ ၂၅-၂-၂၀၁၉ ရက်စွဲပါ စာအမှတ်၊ ဦးအိုင်အေ-၂/ရေနံ(၃၇၆/၂၀၁၉)

(၂) မြန်မာ့ရေနံနှင့်သဘာဝဓာတ်ငွေ့လုပ်ငန်း၏ ၄-၅-၂၀၂၀ ရက်စွဲပါ စာအမှတ်။ ဥဿမ - (၁၅) ၂/ဒ(၁၁၄)၂၀၂၀

၁။ အထက်အကြောင်းအရာပါကိစ္စနှင့်ပတ်သက်၍ မြန်မာ့ရေနံနှင့်သဘာဝဓာတ်ငွေ့လုပ်ငန်းနှင့် အကျိုးတူပူးပေါင်းဆောင်ရွက်လျက်ရှိသော MPRI E&P (Myanmar) Pte. Ltd မှ မကွေးတိုင်းဒေသကြီး၊ မန်းရေနံမြေတွင် အကောင်အထည်ဖော်ဆောင်ရွက်လျက်ရှိသည့် ရေနံပြန်လည်ပွဲ့ဖြိုးတိုးတက်ရေးအစီအစဉ် (Redevelopment and Enhanced Oil Recovery- EOR Programme) ၏ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်း (Environmental Impact Assessment – EIA) အစီရင်ခံစာ တင်ပြလာမှုအပေါ် အတည်ပြုပြန်ကြားစာကို ရည်ညွှန်း (၁) ပါ စာဖြင့် အကြောင်းကြားပြီး ဖြစ်ပါသည်။

၂။ အဆိုပါ MPRI E&P (Myanmar) Pte. Ltd မှ ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း အပိုဒ် (၁၀၈) အရ ရေနံပြန်လည်ပွဲ့ဖြိုးတိုးတက်ရေးအစီအစဉ် (Redevelopment and Enhanced Oil Recovery – EOR Programme) ၏ ပတ်ဝန်းကျင်စောင့်ကြပ်ကြည့်ရှုမှုအစီရင်ခံစာ (Environmental Monitoring Report –EMR) တင်ပြလာမှုအပေါ် မြန်မာ့ရေနံနှင့်သဘာဝဓာတ်ငွေ့လုပ်ငန်းမှ လိုအပ်သလို ဆောင်ရွက်နိုင်ပါရန် ရည်ညွှန်း (၂) ပါစာဖြင့် ဆက်လက်တင်ပြလာပါသည်။

၃။ မြန်မာ့ရေနံနှင့်သဘာဝဓာတ်ငွေ့လုပ်ငန်းမှ MPRL E&P Pte. Ltd ၏ ပတ်ဝန်းကျင်ဆိုင်ရာ စောင့်ကြည့်စစ်ဆေးမှုအစီရင်ခံစာ တင်ပြလာမှုနှင့်စပ်လျဉ်း၍ အောက်ပါအချက်များကို ကြပ်မတ်ဆောင်ရွက်ပေးနိုင်ပါရန် အကြောင်းကြားအပ်ပါသည်-

(က) လေထုအရည်အသွေးဆိုင်ရာ Parameter ဖြစ်သည့် SO_2 ၏ ရလဒ်အား အမျိုးသား ပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များ (NEQEGs) ၏ သတ်မှတ်ချက်အတွင်းရှိရေး စောင့်ကြပ်ကြည့်ရှုသွားရန်၊

(ခ) ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်တွင် တိုင်းတာမည်ဟု ဖော်ပြပါရှိသော ရေထု အရည်အသွေး (မြေပေါ်ရေ၊ မြေအောက်ရေ) ဆိုင်ရာ Parameter များကို ပြည့်စုံစွာ တိုင်းတာရန်၊

(ဂ) မြေပေါ်ရေအရည်အသွေးကို စောင့်ကြည့်စစ်ဆေးမှုအစီရင်ခံစာတွင် NEQEGs နှင့် နှိုင်းယှဉ်ထားပါသဖြင့် အိမ်နီးချင်းနိုင်ငံများ၏ မြေပေါ်ရေအရည်အသွေး သတ်မှတ်စံချိန်စံညွှန်းများနှင့် နှိုင်းယှဉ်ဖော်ပြရန်၊

(ဃ) ဆူညံသံသက်ရောက်မှုကို အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များ၏ သတ်မှတ်ချက်အတွင်းရှိစေရေး ဆောင်ရွက်သွားရန်၊

(င) အတည်ပြုပြီး ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းအစီရင်ခံစာတွင် ဖော်ပြပါရှိသည့် ထိခိုက်မှုလျော့ချမည့်နည်းလမ်းများအား လိုက်နာဆောင်ရွက်သွားရန်နှင့် စောင့်ကြည့်စစ်ဆေးမှုအစီရင်ခံစာတွင် ထည့်သွင်း ဖော်ပြသွားရန်။

၄။ သို့ဖြစ်ပါ၍ မြန်မာ့ရေနံနှင့်သဘာဝဓာတ်ငွေ့လုပ်ငန်းမှ MPRL E&P Pte. Ltd ၏ ပတ်ဝန်းကျင်ဆိုင်ရာ စောင့်ကြည့်စစ်ဆေးမှုအစီရင်ခံစာနှင့်စပ်လျဉ်း၍ ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်တွင် ဖော်ပြပါရှိသော ကတိကဝတ်များအတိုင်း လိုက်နာဆောင်ရွက်နိုင်ရေး ကြပ်မတ်ပေးပါရန် ညှိနှိုင်းအကြောင်းကြားအပ်ပါသည်။

ညွှန်ကြားရေးမှူးချုပ် (ကိုယ်စား)
(မင်းမော်၊ ဒုတိယညွှန်ကြားရေးမှူးချုပ်)

မိတ္တူကို
- ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန၊ မကွေးတိုင်းဒေသကြီး
- အထွေထွေမန်နေဂျာ၊ MPRI E&P Pte. Ltd
- ရုံးလက်ခံ/မျှောစာတွဲ

Figure 69: ECD comments after second monitoring report.

For the effective environmental management, the second time Environmental Monitoring Report was submitted to MOGE on 28 April 2020 and the third time environmental survey was conducted by the third-party service provider, ALARM, in July 2020. The progress of environmental management was updated to ECD and MOGE at the ECD office, Nay Pyi Taw by conducting environmental monitoring workshop on 12 August 2020.

Figure 70: Environmental Monitoring Workshop with MPRL E&P, ECD & MOGE

MPRL E&P Pte Ltd. ၏ ဒုတိယအကြိမ် ပတ်ဝန်းကျင်ဆိုင်ရာ စောင့်ကြည့်စစ်ဆေးမှု အစီရင်ခံစာတွင် တင်ပြထားသည့် အချက်များနှင့်စပ်လျဉ်း၍ မြန်မာ့ရေနံနှင့် သဘာဝ ဓါတ်ငွေ့လုပ်ငန်း မှတစ်ဆင့် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန၏ ၁၂-၆-၂၀၂၀ ရက်စွဲပါစာအမှတ် အရည်အသွေး-၂/ဆစရ(၂၂၆/၂၀၂၀) ဖြင့် အကြောင်းကြားစာပါ အချက်များအပေါ် အောက်ပါအတိုင်း ဆက်လက်ကြပ်မတ်ဆောင်ရွက်သွားမည် ဖြစ်ပါကြောင်း အစီရင်ခံ တင်ပြအပ်ပါသည်။

(က) လေထုအရည်အသွေးဆိုင်ရာ Parameter များဖြစ်သည့် SO_2 ၏ ရလဒ်များအား အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များ (NEQEGs) ၏ သတ်မှတ်ချက်အတွင်း ရှိရေး စောင့်ကြပ်ကြည့်ရှုသွားရန်၊

- ရေနံအထွက်တိုး စီမံကိန်း အကောင်အထည်ဖော် ဆောင်ရွက်မှုကို အရှိန်အဟုန်မြှင့် ဆောင်ရွက်ခြင်းနှင့်အတူ လုပ်ငန်းလည်ပတ်မှုကြောင့် ပတ်ဝန်းကျင် လေအရည်အသွေး ထိခိုက်မှု အနည်းဆုံးဖြစ်အောင် အကောင်အထည်ဖော် ဆောင်ရွက်လျက်ရှိပါသည်။ MPRL E&P အနေဖြင့် ယခု ၂၀၂၀ ခုနှစ် ဇူလိုင်လအတွင်း၌ တိုင်းတာခဲ့သော ရလဒ်များအရ အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များ (NEQEGs) ၏ သတ်မှတ်ချက်အတွင်း၌သာ ရှိနေကြောင်း တွေ့ရှိခဲ့ရပါသည်။

(ခ) ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်တွင် တိုင်းတာမည်ဟု ဖော်ပြပါရှိသော ရေထုအရည်အသွေး (မြေပေါ်ရေ၊ မြေအောက်ရေ)ဆိုင်ရာ Parameter များကို ပြည့်စုံစွာတိုင်းတာရန်၊

- MPRL E&P အနေဖြင့် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်တွင် တိုင်းတာမည်ဟု ဖော်ပြပါရှိသော ရေထုအရည်အသွေး (မြေပေါ် မြေအောက်ရေ) ဆိုင်ရာ Parameter များအနက် Uranium မှအပ ကျန် Parameter များအားလုံးကို နမူနာကောက်ယူ စစ်ဆေးနိုင်ခဲ့ပါသည်။ မြန်မာပြည်အတွင်းရှိ Lab များသည် Uranium အားတိုင်းတာရန် facility မရှိပါသဖြင့် မတိုင်းတာ နိုင်ခဲ့ခြင်း ဖြစ်ပါသည်။

(ဂ) မြေပေါ်ရေ အရည်အသွေးကို စောင့်ကြည့်စစ်ဆေးမှုအစီရင်ခံစာတွင် NEQEG နှင့် နှိုင်းယှဉ်ထားပါသဖြင့် အိမ်နီးချင်းနိုင်ငံများ၏ မြေပေါ်ရေ အရည်အသွေး သတ်မှတ်စံချိန်စံညွှန်းများနှင့် နှိုင်းယှဉ်ဖော်ပြရန်၊

- MPRL E&P အနေဖြင့် တတိယအကြိမ်စောင့်ကြည့်စစ်ဆေးမှု အစီရင်ခံစာတွင် တိုင်းတာရရှိသည့် မြေပေါ်ရေအရည်အသွေးများအား အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်ပါသတ်မှတ် စံချိန်စံညွှန်းများနှင့်သာမက Surface water quality standard of Vietnam၊ WHO၊ USEPA၊ NDWG(Myanmar)(2019) တို့နှင့်ပါ နှိုင်းယှဉ်ကိုးကား ထည့်သွင်းဖော်ပြထားပါသည်။

(ဃ) ဆူညံသံသက်ရောက်မှုကို အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန်ချက်များ၏ သတ်မှတ်ချက်အတွင်းရှိစေရေး ဆောင်ရွက် သွားရန်၊

- သတ်မှတ်ဖော်ပြထားသည့် စီမံကိန်းဧရိယာတွင် ကျေးရွာများ၊ လူနေအိမ်ခြေများ တဖြည်းဖြည်း တိုးတက်များပြား အခြေချနေထိုင် လာသည်နှင့် အမျှ၊ မိမိတို့လုပ်ငန်း လုပ်ကိုင်မှုနှင့် မပတ်သက်၊မဆက်စပ်သော နေရာများတွင် လူနေအိမ်ခြေများ၊ စက်ယန္တရားများ၊ ဆိုင်ကယ် မော်တော်ယာဉ်များ၊ လူတို့သွားလာလှုပ်ရှားမှုနှင့် လုပ်ကိုင်ဆောင်ရွက်သော အသံများကြောင့် ဆူညံသံ ညွှန်းကိန်းအပေါ် သက်ရောက်မှု အနည်းနှင့်အများ ဖြစ်ပေါ်စေလျက်ရှိပါသည်။ ရေနံအထွက်တိုး စီမံကိန်း အကောင်အထည်ဖော် ဆောင်ရွက်ရာတွင် လုပ်ငန်းကြောင့် ဖြစ်ပေါ်လာမည့် ဆူညံသံ သက်ရောက်မှုရလဒ်များကို သတ်မှတ် လမ်းညွှန်ချက်အတွင်း ရှိစေရန် ဆက်လက်အကောင်အထည်ဖော် ဆောင်ရွက်သွားမည် ဖြစ်ပါသည်။

(င) အတည်ပြုပြီး ပတ်ဝန်းကျင်ထိခိုက်မှု ဆန်းစစ်ခြင်း အစီရင်ခံစာတွင် ဖော်ပြပါရှိသည့် ထိခိုက်မှုလျှော့ချမည့် နည်းလမ်းများအား လိုက်နာဆောင်ရွက်သွားရန်နှင့် စောင့်ကြည့် စစ်ဆေးမှုအစီရင်ခံစာတွင် ထည့်သွင်းဖော်ပြသွားရန်၊

MPRL E&P အနေဖြင့် အတည်ပြုပြီး ပတ်ဝန်းကျင် ထိခိုက်မှု ဆန်းစစ်ခြင်း အစီရင်ခံစာတွင် ဖော်ပြပါရှိသည့် ထိခိုက်မှုလျော့ချမည့် နည်းလမ်းများအား အမြဲမပြတ် လိုက်နာဆောင်ရွက်လျက်ရှိပြီး အဆိုပါလိုက်နာ ဆောင်ရွက်မှုများကို ယခုတင်ပြသည့် တတိယအကြိမ် စောင့်ကြည့်စစ်ဆေးမှု အစီရင်ခံစာတွင်လည်း ထည့်သွင်းဖော်ပြထား ပါကြောင်းနှင့် မိမိတို့လိုက်နာ ဆောင်ရွက်မည့် ကတိကဝတ်ပါ အချက်များအား ဆက်လက်၍ လိုက်နာ အကောင်အထည်ဖော် ဆောင်ရွက်သွားမည် ဖြစ်ကြောင်း အစီရင်ခံတင်ပြအပ်ပါသည်။

M.O.G.E.

MPRL E&P

OGM Operational Grievance Mechanism

& CSR Corporate Social Responsibility

9.0 Operational Grievance Mechanism (OGM)

MPRL E&P is the first company in Myanmar to establish and use an Operational Grievance Mechanism (OGM) that is based on the UN Guiding Principles on Business and Human Rights. The OGM at MPRL E&P is a process for systematically receiving, investigating, responding to, and closing out complaints or grievances from affected communities in a timely, fair and consistent manner. Our grievance management system aims to be based on dialogue with our stakeholders first and foremost, and is designed to prevent any retaliation risks. We consider this to be essential in order to maintain a social license to operate in Mann Field. The OGM completes the Mann Field Social Management Plan.

MPRL E&P works closely with the Operator of Mann Field, Myanma Oil and Gas Enterprise (MOGE), providing advice, support, and guidance. The objective is to enable local communities to have a voice and to ensure impact associated with operations affecting the environment and surrounding communities are solicited, monitored, and effectively addressed.

We aim to solve all grievances quickly. Depending on the severity level of a grievance and the type of issue raised, the response to the complainant can take anywhere between first 24 hours in cases where immediate resolution is necessary and/or possible up to a maximum of 30 days in cases (rare, if within our sphere of influence) where detailed investigations or resolutions are required.

To encourage the accessibility by stakeholders, the existence of OGMs and details of processes must be known to them. Information for the potential users of the OGM and wider communication to the general public are essential.

MPRL E&P recognizes the need to ensure that there is an effective grievance mechanism with a non-retaliation policy in place, promoting fairness, confidentiality and respect for communities, and effective engagement between concerned stakeholders in Mann Field. During the last six months, 11 OGM cases have been received and closed out.

To date, there is a total number of 127 OGM cases logged as of September 2020. According to KAP survey results, almost all of the villagers in Mann Field communities are aware of OGM process and procedures. It is proved that the annual awareness raising activities that conducted since 2014 bring us a good result and met our targets.

9.1 OGM At-A-Glance: Key Performance Indicators

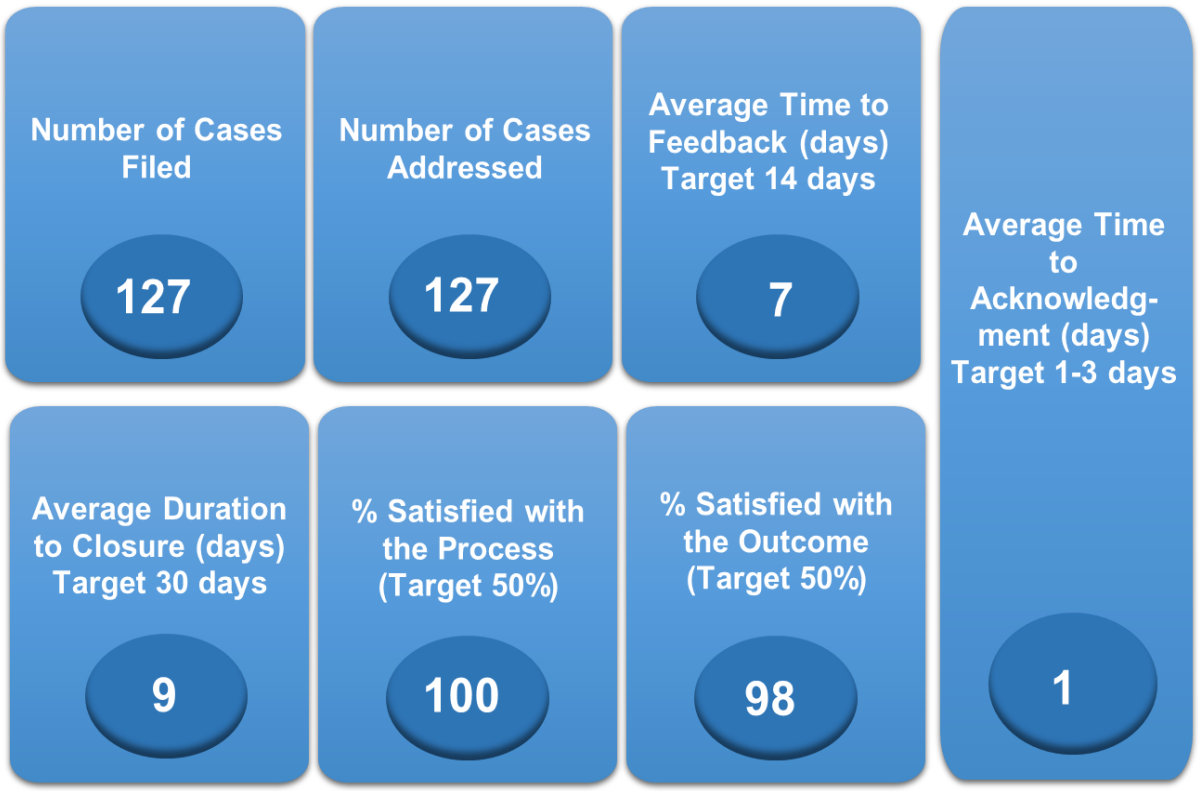


Figure 71 : Key Performance Indicators of OGM: September 2014 – September 2020 (Cumulative)

Figure 72: Key Performance Indicators of OGM: April 2020 – September 2020

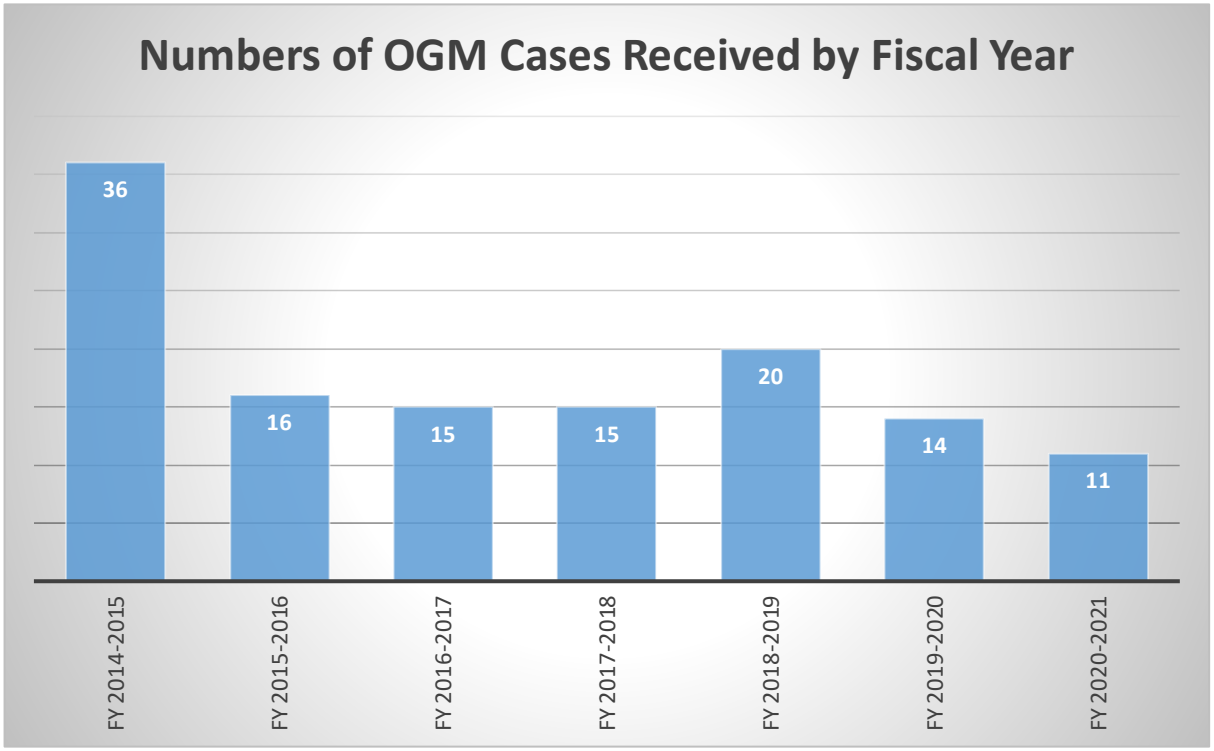


Figure 73: OGM Cased Received by Fiscal Year

9.2 Grievances Addressed during April 2020 – September 2020

(All cases met the KPIs.)

No.	Case Number	Date Received	Concerns	Category	Action Taken	Duration between Receipt and Closed (Days)	Satisfaction with Process
1	202003/02	29/03/2020	The volunteers from Ma Kyee Chaung; Ko Kyaw Min reported to CSRFC that the MOGE staffs who was assigned to Oil Well Servicing Car around GOCS-4 were selling oil to U San's son. (U San is a staff of Mann Oil Field Security Department, MOGE	Others	CSRFC immediately reported this case to AFOM and then the AFOM reported back to MOGE GM. As the perpetrators are MOGE staff and we do not have the right to take action for those staffs, we provided feedback to the complainant that the action will be taken by Mann GM as it directly relates to MOGE and explained the condition to him. The case was registered as an OGM case and closed on 3 April 2020. The complainant was satisfied with our feedback.	5	The complainant was satisfied with the process and the result. All KPIs were met.
2	202004/01	25/04/2020	A volunteer from Chin Taung Village reported that the power line rub against mango branches and sometimes causing a spark.	Electricity Hazard	Field CSRFC immediately reported this case to field AFOM and then he reported this case to MOGE electrical department. The MOGE repair the wire and the case closed on 27 April 2020.	2	The complainant was satisfied with the process and the result. All KPIs were met.

3	202006/01	12/06/2020	On 12 June, U Win Naing Soe from Mei Bayt Kone village reported an OGM case that the pipeline crossing his farm has caused difficulties in cultivation. He requested to move the pipeline to the side of the farm if the pipeline is still in operation and if not, to remove it.	Remove/ bury old pipelines	CSR Field Coordinator informed the MPRL E&P Field Operations Team about the case. The Field Operations Team decided to remove the pipeline within the agreed OGM timeline. CSR Field Coordinator provided feedback to the farmer on the same day that the pipeline will be removed. MPRL E&P Field Operations Team removed the pipeline and the case was closed on 16th June. The complainant was satisfied with the process and the outcome.	1	The complainant was satisfied with the process and the result. All KPIs were met.
4	202006/02	25/06/2020	On 25 June, U Win Maung from Mei Bayt Kone village requested to remove an old boiler in his farm which has caused difficulties in cultivation.	Others	CSR Field Coordinator (CSRFC) reported the case to MOGE GM at Friday Technical Meeting. On June 27, U Aung Lwin from the Engineer Department and U Win Bo from the Transportation Department (MOGE) made an inspection on case #202006/02 and found that the old boiler is too big that need to move with a big car/ crane. Currently, the surrounding area was plowed and it is difficult to get in with a car. The inspection person from MOGE informed this condition to AFOM that the old boiler can be removed at the end of the rainy season.	5	The case was closed on 30th June 2020.

					CSRFC met with the complainant and explained about this condition. The complainant will be reported this case again at the end of the rainy season. He was satisfied with the process and our explanation. The case was closed on 30 June 2020.		
5	202007/01	01/07/2020	U Myint Than Kyaw from Mei Bayt Kone village reported that the old water pipeline which crossed his compound caused difficulties in cultivation and he requested to remove it if not in use.	Repair water pipeline/ Water supply	CSR Field Coordinator (CSRFC) reported the case to MOGE GM at Friday Technical Meeting. U Aung Lwin from the Engineering Department discussed that the pipeline is kept on standby for nearby wells, so it is not possible to remove it currently. The pipeline will be removed when it is no longer in use in the future. CSRFC met with the complainant and explained the condition.	2	The complainant was satisfied with the feedback. The case was closed on 3rd July.
6	202007/02	14/07/2020	U Kyaw Aung, a farmer from Lay Eain Tan village reported an OGM case related to "Repair Road". He mentioned that the access road to well #632 which crossed his farm caused difficulties in cultivation.	Repair bridge/road	The Construction Department from MOGE made an inspection on the same day and made a new access road on 15th July. The case was closed on 16th July.	2	The complainant was satisfied with the process and the resolution provided.

7	202008/01	24/08/2020	U Myint Than Kyaw from Mei Bayt Kone Village reported that the oil pipeline crossing the road caused difficulties for people and motorcycles while using this road. He requested to bury the pipeline.	Remove/ bury oil pipeline	CSR Field Coordinator made a visit, took photo records, and acknowledged the receipt of the complaint on the same day. Then she reported the case to AFOM. MPRL E&P Field Operations Team made an inspection on the next day and buried the pipeline.	1	The complainant was satisfied with the feedback. The case was closed on 25 August. It took two days between receipt and closing out of the complaint.
8	202009/01	09/09/2020	U Than Zaw U from Aye Mya Village requested to relocate the oil and gas pipeline that connected from Well #25 outside the fence.	Remove/ bury old pipelines / repair oil pipelines	U Than Zaw U from Aye Mya Village requested to relocate the oil and gas pipeline that connected from Well #25 outside the fence. MPRL E&P Field Operation Team make an inspection and agreed to relocate the pipeline. On 11th Sept 2020, the field operation team relocated all the pipeline to the outside of the fence and the case was closed on that day.	2	The complainant satisfied with the process and the outcome.
9	202009/02	09/09/2020	U Than Myint from Mei Bayt Kone reported that the electric pole and wire in his farm are wrapped by branches and vines and can cause electric shock.	Fire hazard/electricity hazard	MOGM electrical department makes an inspection on 12 Sept 2020 and resolved the case on 13 Sept 2020. CSRFC met with the complainant and closed the case on 14 Sept 2020. It took for days between the case received and the closed date. All KPIs are met and the	5	The complainant satisfied with the process and the outcome.

					complaint satisfied with the process and outcome.		
10	202009/03	24/09/2020	U Nyunt Win from Mei Bayt Kone village reported an OGM Case through a phone call to CSRFC. He said the power line near his farm (between well #25 and #292) rubbed against branches and caused sparks.	Fire hazard/electricity hazard	CSRFC reported to the MPRL E&P field operation team and then to MOGE. The representatives from MOGE Electrical Department made an inspection immediately and repaired the electrical spark on the same day.	1	The case was closed on 25 Sept. he complainant was satisfied with the process and the outcome. All KPIs are met.
11	202009/04	28/09/2020	U Kyaw San Win from Man Kyoe Village reported that the power line at his farm rubbed against palm tree branches and it can cause an electrical hazard. He suggested resolving the issue as required.	Fire hazard/electricity hazard	CSRFC reported this case to MPRL E&P Mann Field Office and then to MOGE. The MOGE Electrical Department made an inspection on 29/Sept/2020 and cut down the palm tree on that day.	2	CSRFC met with the complainant and closed the case on 30/Sept/2020. The complaint satisfied with both of the processes and outcomes and all the KPIs are met.

The following testimonials relate complainants' experiences with MPRL E&P's OGM and document their feedback in order to contribute to the existing evidence on the functioning of the OGM

Daw Ohn Kyinn
Auk Kyaung Village

I became familiar with MPRL E&P's OGM processes through a community mass meeting, pamphlets, and community volunteer of our village. I participated in the OGM Awareness Raising Campaign and won prizes two times in Q&A sessions. In the past, there was an unused pipeline laid across my compound and I faced some challenges to reconstruct my house. After submitting a grievance to MPRL E&P, they came to inspect the pipeline, and removed it within a week as it was no longer in use. I could reconstruct my house as I wished finally. I also suggest others to reach out to MPRL E&P's CSR team in consultation with village administration and community volunteers if they have any concerns.

U Win Naing Soe
Mei Bayt Kone Village

There was a pipeline laid across the middle of my farmland and caused a lot of problems for me when I tilled my land. I learned about MPRL E&P's OGM in a community meeting at the Damaryone in the village, so I submitted my grievance through our village community volunteer. MPRL E&P's Field Operations Team inspected it and removed the unused old pipeline the next day. Only when they removed the old pipelines, I was able to work more effectively on my farmland and till my land properly. I thank MPRL E&P's CSR staff who are always approachable when we have some concerns.

U Kyaw Htun
Kyee Pin Kan Village – 2

One day when I chit-chatted with an employee from MOGE Production Department, I mentioned to him about the two old concrete tanks sitting in the middle of my farmland that caused difficulties in cultivation. He suggested me to contact MPRL E&P's CSR Team for submitting my grievance. They came to address and resolve the situation. There are no more areas that are fallow on my farmland. I am so happy now as I can grow crops on the entire field. I wish MPRL E&P and its OGM exist here in Mann Oil Field for us for a long time and remain a part of our communities. The OGM helps us greatly in reaching out to the company easily and our concerns are looked into immediately.

10.0 Corporate Social Responsibility

Positive relations with local communities are critical for our industry. Operating in local communities requires a sound understanding of community concerns, and a willingness of both MPRL E&P and community groups to work together for each other's betterment. Through open dialogue opportunities for us to invest in communities become apparent and we can mitigate the impact of our operations to maintain our social license to operate.

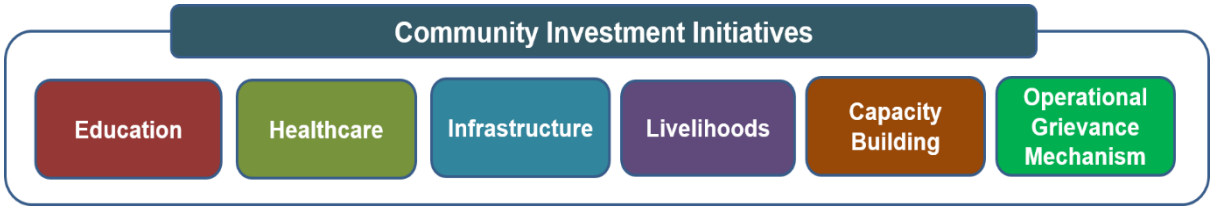
We have in place policies and procedures with regard to engaging and supporting local communities in our operations areas and our policies are publicly available on our website. Our intention is to focus on community investment projects that address both our impacts and major development issues in our host communities. In this regard, we engage with all stakeholders in ensuring sufficient data and information is collected and potential development options are identified together. We apply a monitoring and evaluation framework to track progress and report performance with the use of applicable tools and guidelines in a timely and transparent manner.

10.1 Supporting Communities

MPRL E&P is committed towards enhancing and improving the lives of the Mann Field communities, of which major livelihood activity is farming, and helping them achieve self-reliance. MPRL E&P, in line with these CSR objectives, aims to implement a range of livelihood development initiatives in Mann Field, and in this regard, its CSR Program has supported vocational education opportunities and agriculture and livestock activities for youth, women and farming households in Mann Field.

We recognize that strategic community investment projects should provide value for the company and impact the community positively. As a result, we aim to contribute to the sustainable development and improved livelihoods of communities where we operate through active engagement and regular dialogue. Our business objectives for community investment include building relationships and enabling employee engagement. Led by the CSR and Communications Department, our participatory community investment initiatives aim to engage with and support local communities where we operate. We do this through:

- Having an effective functioning Grievance Mechanism
- Investing in sustainable livelihoods (agriculture, livestock breeding, healthcare, capacity development, and vocational training)
- Improving well-being (improved access to water, sanitation, hygiene, health, nutrition, and safety culture)
- Partnerships with local and regional organizations



10.2 Our Approach

MPRL E&P intends to contribute to sustainable development of our host communities and improvement in livelihood opportunities in Mann Field. The company does this through establishing local and regional partnerships and investing in sustainable vocational skills development and livelihood development.

Our CSR initiatives aim to raise rural living standards through increased investment in community infrastructure, human resources and services for employment and income generation. Two main areas which MPRL E&P will mainly focus in this fiscal year are community capacity building and improving agricultural and livestock productivity.

Fostering Agricultural Production and Rural Development

The key objectives of this priority area are to increase agricultural output and productivity, raise rural living standards, improve market access and support agribusiness.

We expect the following outcomes from our agricultural initiatives:

- Increased output and productivity of agriculture, focusing on major crops as well as livestock;
- Supporting the development of agriculture, agri-business and agro-industries particularly for small farmers and entrepreneurs, enabling them to respond to market opportunities, build resilience and attract investment; and
- Improved market access for small-scale producers and promoting inclusive growth.

Community Capacity Building

It is about promoting the 'capacity' of local communities to develop, implement and sustain their own solutions to problems in a way that helps them shape and exercise control over their physical, social, economic and cultural environments.

We expect the following outcomes from our community capacity building initiatives:

- Expanding, diverse, inclusive community participation
- Expanding leadership base
- Strengthening individual skills
- Encouraging a shared understanding and vision
- Strategic community agenda
- Facilitating consistent, tangible progress toward goals
- Creating effective community organizations and institutions
- Promoting resource utilization by the community

During the third quarter of the fiscal year 2019-2020, the CSR Team initiated a materiality assessment exercise with the assistance of CSR Asia (an ELEVATE company) in order to review the CSR strategy as well as the CSR initiatives that have been implemented over these years for the sustainable development of the

local communities in Mann Field. In this regard, the Team has developed a long-term CSR plan covering FY 2019-2020 to FY 2023-2024, a period of five fiscal years towards the end of the current PCC, which outlines our intervention logic and provides a long-term vision for stakeholder value creation in our project area, a vision for a sustainable and prosperous community.

Built upon the existing CSR strategy, this CSR Plan reinforces some of the best practices while allowing bold actions in focus areas. Through continuous engagement and assessments over the years, the plan aims to present a way to tackle local development challenges identified and empower communities. In essence, it serves as a framework integrating existing activities and further to align them with national development goals and global SDGs.

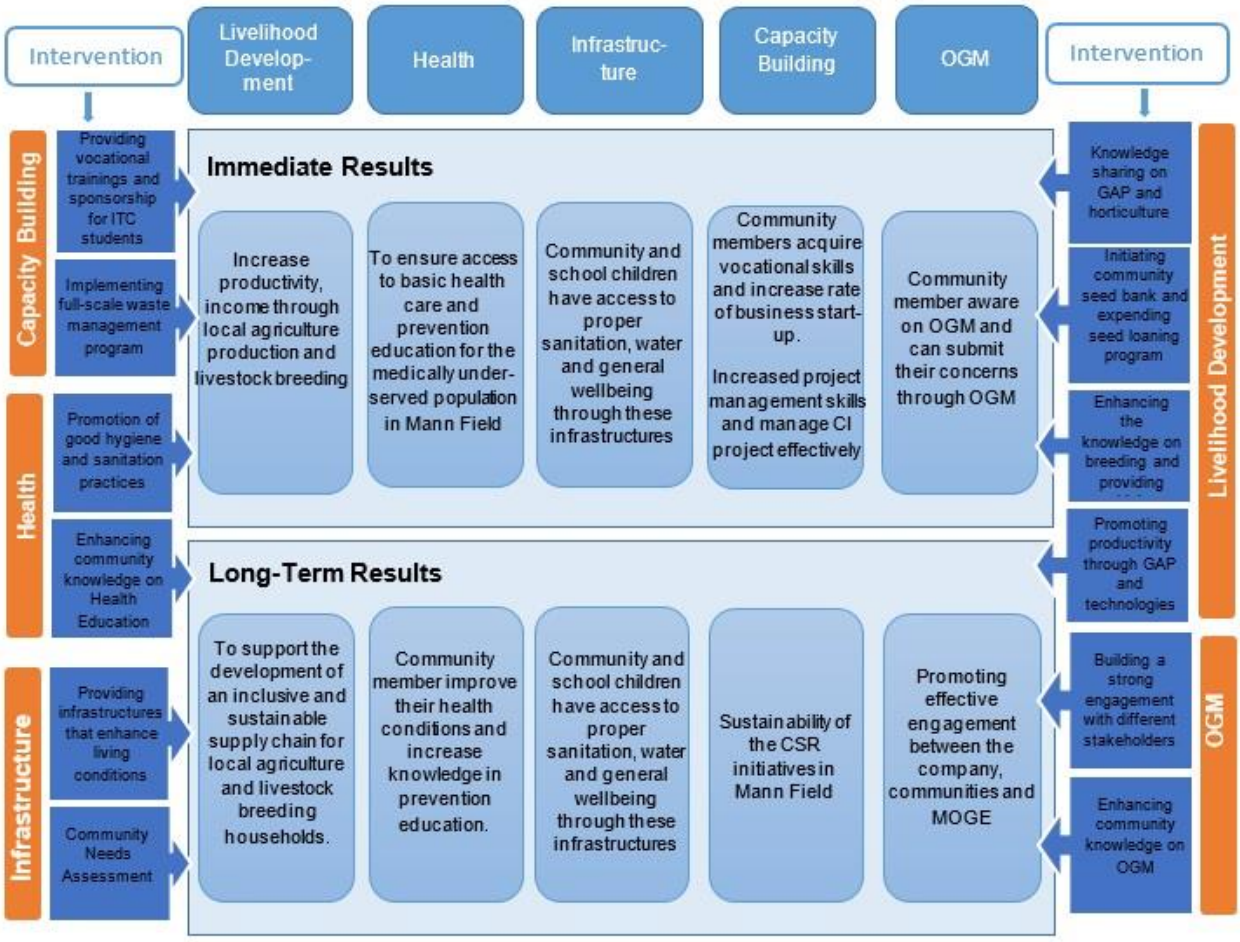


Figure 74: MPRL E&P's CSR Strategy Diagram – 2020 to 2024

10.3 Community Infrastructure Development

MPRL E&P aims to continue supporting infrastructure needs in Mann Field in order to help close the country's infrastructure gap that is worth $120 billion between now and 2030 according to the ADB's estimate and contribute to inclusive and sustainable growth of the communities nearby by widening the scope of its needs assessment exercises as required in future. The major beneficiaries of our infrastructural development initiatives are communities and schools.

MPRL E&P ensures that community infrastructure in the Mann Field communities are provided in appropriate locations, responds to current needs, and remains adaptable to the needs of an evolving community. MPRL E&P's community infrastructure development focuses around strengthening local capacity to address the need for infrastructure by involving local communities, by increasing the efficiency in terms of how infrastructure is planned, designed, implemented and maintained, and relying to the extent possible on locally available resources. Up to this point, the community infrastructure development initiatives in Mann Field concern with primarily low-cost small scale basic structures and facilities built at the community level through the assessment process which is guided by insights and involvement of the communities to help sustain their lives and livelihoods.

During the past six months, MPRL E&P has carried out one community investment initiative that addresses infrastructural needs in the communities and schools in Mann Field. MPRL E&P has supported one infrastructure initiative for school in Let Pa Taw village. As the school has no proper water storage system for school latrine and hand washing facility MPRL E&P have supported elevated water storage tank in collaboration with school committee. The CSR Field team also facilitated a cartoon wall painting process in the KG Classroom at Auak Kyaung Village.

Figure 75: Constructing Water Tank for School Hand Washing Station at Let Pa Taw Village

Figure 76: Cartoon Wall Painting Process for KG Classroom in the Auak Kyaung Village

Figure 77: Estimating the Cost of Constructing Culverts at the Let Pan Ta Pin Village with the Assistance of Special Project Team

10.4 Livelihood Development Programs

Vocational Skills Development

MPRL E&P's CSR initiatives in Mann Field include vocational trainings starting from the fiscal year 2016-2017 in an effort to help the community members acquire livelihood skills and employment opportunities for women and young people other than agriculture through cooperation with respective training provider organizations. The vocational trainings will be continued in line with the needs of the targeted community members.

With the support of the MPRL E&P, a group of three women started their group business and named their group as "*May Nant Thar*". Other trainees are also producing soap with their own brand name and distributing in their surrounding area. During the reporting period, MPRL E&P collaborated with a resource person from the SSID-Magway to teach making hand gel to the member of May Nant Thar group. As high market demand for liquid soap and hand gel during COVID 19 pandemic period, they are producing locally made hand gel and distributing to surrounding communities with affordable price.

Regular follow-up activities with former vocational trainees and women's business group are also conducted in order to continue providing necessary support while helping them exchange ideas, apply lessons learnt and identify best practices in starting and extending their own businesses.

The growth and yield performance of mushroom model farm is monitored. During dry season, cloud ear mushroom cannot be cultivated due to low humidity. Only rainy and winter seasons are most suitable for farming that type of mushroom in Mann Field. In this fiscal year, more efforts will be put on farming other types of mushroom and making mushroom spawn seeds.

Figure 78: Monitoring the Mushroom Model Farm at Chin Taung Village

Agricultural Initiatives

Improving agricultural productivity initiatives in Mann Field cover access to sustainable agricultural practices such as GAP (Good Agriculture Practice) and quality seeds for the agricultural households. The goal is to enable all these farming households to increase their agricultural productivity sustainably through access to modern agricultural knowledge and region-suited quality seeds.

In summer sesame crop season, MPRL E&P supported quality seeds to the farmers who are interesting to try to adopt GAP method. Total 42 farmers participated to dopt GAP method in 87 acre. During the crop season, MRPL E&P facilitated with DOA Minbu for the technical support for the farmers and Field extension staffs are closely monitored the situation of the crop up to the harvesting time. After harvested, continuous support for GAP certification process and market access for GAP crop. MPRL E&P also conducted reflection workshop with farmers together with Field extension staff from DOA. The figure below are key takeaways and findings from the workshop.

Discussion points	Strengths	Weaknesses	Way Forward Plans
Seeds Selection and Soil Test	- Good yields - Close supervision from field experts from DoA-Minbu - Know about their soil situation - No need to test soil in next 5 years	- Seeds are not 100% purity - Selling price may decrease under expected	- To source high quality seeds for next crop season in collaboration with DoA-Minbu - To continue soil test due to flooded farming areas
GAP Record Keeping	- Aware the exact cost of agricultural inputs - Can assess the frequent use and amount of pesticides or fertilizers - Can analyze the cost and benefit properly	- No proper records due to lack of practice on record keeping	- To explain farmers the importance of record keeping in GAP - To keep records properly based on this year's experiences
Following GAP Process and Procedures	- Regular collaboration with field experts from DoA-Minbu - Pests prevention - Received good practice on using and choosing pesticides	- Labor shortage - Cannot control pest due to lack of collaboration among farmers	- Close collaboration with field experts from DoA-Minbu for pest control - Follow instructions of DoA-Minbu extension staff in selection of right pesticides - Planning for pest control in advance - Provide training for farmers to produce natural pesticide

Discussion points	Strengths	Weaknesses	Way Forward Plans
GAP Knowledge Sharing and Technical Support by Extension Staff from DoA-Minbu	- Field monitoring in every two weeks - Provided technical advice and knowledge sharing regularly	- Workload and weather constraints for regular field visit by Extension Staff from DoA-Minbu - Difficult to gather all farmers at the same time	- To build mode of communication system among farmers - To set a proper planning at the beginning of the crop season
Quality of Sesame and the Cost and Benefit Comparison between GAP Cultivation System and Traditional Method	- Good quality - Traders prefer produced products under traditional method - Higher density than products produced under traditional method - Lower input cost	- Labor shortage in harvesting time - Color of product is dull due to hybrid varieties - Lower market price than pure black sesame	- Source quality seeds - Organize farmers to cultivate same variety of seeds and same techniques collectively - Source financial support for agriculture inputs (harvesting machinery, pesticide) - Encourage farmers to form Association of Smallholder Sesame Producers for collective selling and competitive advantages - Request DoA-Minbu for providing natural pesticide making training

Figure 79: Field Visit of Extension Staff from the Department of Agriculture (DoA-Minbu) to Sesame Model Farms at Lay Eain Tan Village

Figure 80: Local Farmers Receive GAP Certification

Figure 81: Reflection Workshop on GAP Sesame Program with Smallholder Farmers at the Lay Eain Tan Village

Figure 82: Facilitating Lead Farmers' Selection of Seeds from the DoA-Minbu

Figure 83: Discussions with Township Officer from the the DoA-Minbu

Figure 84: Field Visit of CSR team to Tomato Farms in Mann Field Communities

Livestock Breeding Initiatives

The livestock breeding iniatitives in Mann Field for Fiscal Year 2020-21 will cover breeding free-range Myanmar chicken with the objectives of enabling livestock breeders from the community to enhance their livelihood practice and to develop a safety net in time of immediate financial needs/debts. In order to help overcome this problem, MPRL E&P will partner with the Department of Livestock and Veterinary. To implement the

above objective from the basic, MPRL E&P will faciliatae Department of Livestock and Veterinary for sharing knowledge sharing session about livestock breeding to the household who breed some poultry, pigs and cows in small scale.

As for the communities who are interested to start livestock breeding, MPRL E&P arranged the knowledge sharing sessions on the Animal Husbandry for Mann Field Communities, in coordination with the Livestock Breeding and Veterinary Department of Minbu in the month of August 2020.

In cooperation with the Livestock Breeding and Veterinary Department (Minbu), a knowledge sharing session on raising domestic animals for food and other products for the interested communities in Mann Field was conducted at Kyar Kan Village for a total of 41 attendees.

Figure 85: Knowledge Sharing Sessions on Animal Husbandry

10.5 Community Capacity Building

Community capacity building plays a central role in promoting community involvement in implementation of community initiatives in Mann Field with sustainability in mind. It plays an important part in the delivery of CSR initiatives in Mann Field so that communities' capacity can be enhanced to mobilize the local resources and manage implementation and sustainability of infrastructural projects in their communities. The targeted beneficiaries include the Community Volunteers, Village Administrators, Village Development Committee, households and schools.

Community capacity building trainings were provided to the Village Development Committees and Community Volunteers who play an essential role in implementing successful and sustainable community investment initiatives in Mann Field.

During the first six months of the fiscal year, Village Development Committees from Aye Mya and Chin Taung have been trained in Community-Based Organization in modular course sessions basis. The Community Volunteers also receiving mentoring sessions regularly.

Figure 86: Monthly Mentoring Session for Community Volunteers

Figure 87: Monthly Community Volunteers Meeting

Figure 88: Assessment on Community Volunteers' Performances

10.6 Community-led Waste Management

MPRL E&P have been implementing a community-led waste management system in Mann Field since January 2019. The waste management system which was rolled out in eight villages initially is today managed by a group of Community Volunteers who are committed to run it efficiently and the coverage has also been extended to 12 villages out of 14 in Mann Field. Up to date, we have cleaned up 988.7 matric tons of waste in Mann Field of which communities lack access to a municipal waste collection service. Our aims are to raise awareness on the importance of proper waste management for a better environment and sustainable development, and too motivate all concerned to take collective actions on proper waste management.

The Community Volunteers are working together as a service provider using a three-wheel cargo motorbike supported by MPRL E&P to kickoff the system. Our opinion survey on the waste management system in Mann Field indicates 100% of the respondents want the waste management system run for the long term as it is a good initiative that keeps the community clean and serves as the best way to dispose of waste systematically.

However, MPRL E&P have observed there is a loading capacity issue of the cargo motorbike and a higher monthly maintenance cost as a result of extension of coverage of the waste management system in Mann Field. It is struggling to operate to cover all the 12 villages and the situation is likely to get worse in the future. Therefore, we consider a bigger and stronger vehicle to be a solution for these issues because sustainability of the community-led waste management system rests with regular operations of the system and community participation. In the month of Septermber, MPRL E&P subsidized partially for the committed service provider to buy bigger vehicle to upgrade the facility for smooth operation of daily waste management system in Mann Field.

Figure 89: Comparison of Waste Disposal (Quarterly)

Figure 90: Facilitating a New Waste Management Service run with a Bigger Vehicle by Community Volunteer from Kywe Cha Village

Figure 91: Cleanups by Trash Hero Minbu

10.7 Partnership in Technical and Vocational Education

With the worldwide objective to scale up the offer on TVET programs responding to the needs of the labor market, the national governments are seeking for close alliances of collaboration with the private sector, on macro and micro level, where possible. As a step forward in our CSR initiatives, three male students from the surrounding communities in Mann Field have been accepted and enrolled at the No. 5 Industrial Training Centre in Magway with the support of MPRL E&P. The launching of the educational partnership with No. (5) Industrial Training Centre Magway this fiscal year 2019-2020 is a new CSR initiative for youth in Mann Field.

No. (5) Industrial Training Centre (ITC-Magway)

In the fiscal year 2019-2020, the educational partnership program with No.5 - ITC Magway was initiated and a full scholarship was provided to three students. All three students passed the final exam that was held in March 2020 and they have been awarded certificates on 26 March 2020. At the end of June 2020, when MPRL E&P assessed the situation of job status all three students earned an income job within 3 months after finishing school. The below table shows the achievement of educational partnership program. Below table shows the current job status of three students.

Name	Village	Company	Current Employment Status
Myat Thu Maung	Pauk Kaung Village	Suzuki Myanmar Motor (Thilawa Industry Zone)	• He joined Suzuki Myanmar Motor (Thilawa) as a machine operator since June 2020. • Now, he finished probation and earned MMK 200,000 per month as a basic salary. • He also received around MMK 60,000 as an overtime fees
Zayar Phyo	Man Kyoe Village	MPRL E&P Pte Ltd. (Casual Labor)	• He passed the interviews and joined MPRL E&P as casual labor at Mann Field Office with effect from 5th August 2020. • He was appointed as the position of Boiler Man. • He received MMK 4,800 kyat as a daily wage.
Yazar Aung	Man Kyoe Village	Double Packing Myanmar Limited	• As the spread of the Covid-19 virus around Yangon, his family asked him to come back to the village until the condition is stable. So, he resigned from the work at the end of August 2020 and back to the village.

Figure 92: Zayar Phyo from Man Kyoe Village Working now as Boiler Man

As an education partnership program with No. (5) ITC-Magway in FY 2019-2020, have shown that this program brings a lot of benefits for youth in Mann Field Communities. In this fiscal year 2020-21, MPRL E&P have planned to expand this program by establishing educational partnership with both No. (5) ITC-Magway and No. (4) ITC-Pakokku. A total of 15 applications have been submitted to No.5 ITC Magway to date. The entrance exam is beginning at the end of March every year and the result usually announces in mid of April. Due to COVID-19 pandemic, the entrance exam is postponed until further notice.

Nurse Aide Training Program

Under the educational partnership program, MPRL E&P is launching Nurse Aid Training Program with private training school "Ayeyarwaddy Hospital Group" in this fiscal year 2020-2021 for young women in Mann Field to become nurse aides in private hospitals, nursing homes, and pharmacy. As a step forward in community capacity building, three young female from the surrounding communities in Mann Field have been enrolled to training school in Minbu with the support of MPRL E&P.

After discussion with the trainer and mapping out the possibility of the initiative, an announcement was made publicly to the communities in Mann Field that applications are accepted from the community members who have passed the middle school level and between the ages of 18 and 40, who cannot effort to attend the training with the recommendation of our volunteers and Village Administrators, with the training fees support of MPRL E&P. After a thorough review with the above-mentioned criteria, a total of 15 applications were received. As this program is piloted, only three students will be awarded training fees and others training materials expenses for the first batch. CSR team will review this training program after the pilot period for assessing the success of the program and make decision on future planning.

In June, the Head of the training center and the assistant screened the applications, conducted the candidate interview and selected three students who met their requirements.

Figure 93: Candidates Interview for the Nurse Aide Training Program with the Ayeyarwaddy Pharmacy and Health Care Training Center in MinbuFigure 94: Three

Figure 94: Trainees from Mann Field Completed the 2-month Nursing Aide Training

Figure 95: Meetup with the Parents of Nurse Aide Trainees and the Visit of MPRL E&P's CSR Team to Ayeyarwaddy Pharmacy and Health Care Training Center (Yangon)

Potential Partnership Program

The CSR Team in Mann Field visited the State Agricultural Institute in Pwint Phyu and discussed about an educational partnership program, conducted information sessions about the State Agricultural Institute (Pwint Phyu) for the interested community members. Application forms were also collected from the attendees.

Figure 96: Discussions on Potential Partnership with the State Agriculture Institute (Pwint Phyu)

11.0 Community Health Care Program

MPRL E&P's Mobile Clinic Program is focused on providing the most vulnerable with quality health care and prevention education for Mann Field communities. Initiated a pilot project in September of 2018, the clinic is open at Chin Taung village on Mondays, Lay Eain Tan village on Thursdays, Let Pan Ta Pin village on Fridays and Kyar Kan Village on Tuesdays. A health care assistant from Pauk Kone village has been recruited to assist field camp doctors in running the clinic smoothly and efficiently. *(The mobile clinic program is being suspended with effect from 1st April 2020 in order to reduce the risk of the coronavirus infection.)*

In July, MPRL E&P supported the Auxiliary Midwife Refresher Course organized by the Minbu Public Health Department. A total of 40 midwives from Minbu Township, including two midwives from Mann Field communities and one healthcare assistant of MPRL E&P's Mobile Clinic, attended the course.

Figure 97: Support for the Auxiliary Midwife Refresher Course organized by the Department of Public Health (Minbu)

12.0 Stakeholder Engagement and Information Disclosure

It is important that information on our CSR programs are regularly communicated with a range of key stakeholders in Mann Field, as well as township level and regional level. Through regular and timely stakeholder engagements, we can be confident that a two-way communication which promotes transparency and accountability is present.

In August, the first quarter (FY 2020-2021) CSR Performance Progress Update Meeting was conducted with Village Administration, Village Development Committees and Community Volunteers from the 14 communities in the Auak Kyaung Village. There were a total of 54 attendees in three separate sessions. Additionally, CSR Monthly Bulletins are posted on a monthly basis on the noticeboards in communities as well as at the Mann Field Office. By providing timely information in an appropriate style at an appropriate place we can keep our stakeholders informed of the progresses we have achieved together.

Figure 98: 1st Quarter CSR Performance Progress Update Meeting with Village Administrators, Village Development Committees and Community Volunteers

Figure 99: Monthly CSR Bulletin posted onto Noticeboards at Mann Field Office and in (14) communities

13.0 Success Stories from Mann Field

Telling a New Story with Agriculture: GAP Sesame in Mann Field

Village Administrator U Win Zaw from Lay Eain Tan Village, one of the surrounding communities in Mann Field and a hotspot of MPRL E&P's agricultural initiative, was excited as he saw his fellow villagers preparing the land to grow the region's most popular and promising crop: sesame.

Over the past few months, he has been facilitating knowledge-sharing activities and field trips on a new cultivation method known as GAP for sesame through the Livelihood Development Program initiated by MPRL E&P's CSR Program in cooperation with the Department of Agriculture (Minbu) intending to usher in sustainable farming in Mann Field.

"I learned that the GAP protocols can help our farmers apply a systematic farming method for sesame, produce a better-quality crop, and fetch better prices. For the summer of 2020, we grew 87 acres of sesame using the 16 GAP protocols and 42 farmers from my village participated in the initiative."

Sesame is a cash crop grown throughout the year in Magway, Mandalay and Sagaing regions in Myanmar for food-related consumption and oil production. It is also one of Myanmar's commodities exported to the EU, Japan, South Korea, and China.

There is a great opportunity to increase the country's revenue from sesame exports by generating the crop varieties using organic farming or GAP protocols. The latter were launched in 2017 in Myanmar for certifying 15 crops including sesame, and have been implemented by public and private stakeholders in the agricultural sector along the value chain for the development of a sustainable, safe and high-value agri-business in the country.

One of the GAP protocols suggests growing sesame varieties with genetic purity systematically. U Win Aung, a farmer from Lay Eain Tan Village grows 3 acres using

quality sesame seeds supported by MPRL E&P's CSR Program. He said, "This is the first time I have dedicated up to 3 acres of the land for growing sesame only, and I have harvested 38 baskets of GAP sesame now." U Soe Naing, another sesame farmer, told that there are five steps for sesame cultivation, all of which have been carefully logged in a book.

The steps are land preparation, seeding, upkeep, harvest and drying the crop, according to the farmer who also grows chickpeas, sunflowers, onions, and tomatoes. With regard to securing a GAP certification for the sesame from the Ministry of Agriculture, Livestock and Irrigation (MOALI) through the Department of Agriculture (Minbu), the Village Administrator said, "Conducting soil and water tests to identify their acidity level, which should be pH7 ideally, and timely pest management through the natural pesticides are, among many other requirements, key to the process."

Another important aspect of the GAP certification application process is keeping a complete and detailed log book to ensure the farmers' adherence to and traceability concerning the GAP protocols of the Ministry of Agriculture, Livestock and Irrigation (MOALI). Yet, it proves to be a challenge for some participants as they were unfamiliar with the practice according to the reflection workshop completed in August.

The pandemic has also disrupted the sesame market which makes it difficult for some of the farmers fetch a high price at the time of harvest.

On the other hand, the most widely reported advantages of growing sesame under GAP is higher yields of quality, close cooperation with the Department of Agriculture (Minbu) to solve pest problems as well as observance of the GAP protocols, and the farmers can cultivate the existing land for another 4 years without further soil and water tests. They have also understood the benefits of using a record book for their activities in the fields - they know what the expenses are, when to irrigate and use pesticides, when to harvest and how much their returns are.

With regard to the support provided by the CSR Program and the Department of Agriculture (Minbu), U Nyunt Win, one of the 42 participating farmers, said he has been confident about the inputs and technical assistance. Working together with fellow sesame farmers is an amazing experience for him, and he has earned a good income through the collective marketing of the produce. He shared his success story with others in the community and he said they will follow suit if they can receive inputs in terms of loans, seeds, techniques and machinery.

Ko Kyaw Kyaw Naing, the Community Volunteer of Lay Eain Tan Village, himself has grown 4 acres of GAP sesame and reflected his experience. "There were challenges as a result of the COVID-19 pandemic of which guidelines restricted movement and gathering. However, we were able to gain satisfactory results as well as lessons learned which can be applied to next growing seasons. I myself have been pleased to be a part of this initiative implemented by the CSR Team and the Department of Agriculture (Minbu).

14.0 COVID-19: Our Responses

Supporting medical front-liners and COVID-19 positive patients is very important as the disease unfolds across Myanmar, keeping everyone on the edge of their seats. In this regard, since March 2020, MPRL E&P Group of Companies have steered their donation drives, starting with provision of US$ 13,500 worth 2019-nCoV RT-PCR Test Kits (200 Reaction/Kit) to the National Health Laboratory in Yangon. Then, CEO U Moe Myint and Family continued donating lunch boxes and dinner boxes to doctors, nurses, patients and staff at the Waibargi Specialist Hospital in North Okkalapa and the National Health Laboratory for the whole month of May.

Feeling inspired and in a desire to do their part, MPRL E&P's staff raised a fund together and donated MMK 2,800,000-worth medical supplies to the Minbu General Hospital, Man Kyoe Community Health Center and Mei Bayt Kone Community Health Center in Mann Field. The medical supplies included 160 PPE Sets, 500 cloth masks, 200 N95 masks, 5000 disposable surgical masks, 220 bottles of hand wash and another 220 bottles of hand sanitizer. Additionally, MMK 1,000,000 was supported to Zarmani Myanmar and its Operation Anti COVID-19 Yangon.

For more information, please visit https://mprlexp.com/covid-19-our-responses.

15.0 Conclusion

This environmental monitoring report is the third submission after receiving the ECC in April 2019. During eighteen months period, all the social and environmental commitments were fulfilled as per the EIA and ECC requirements. In the previous monitoring report, Air quality and noise level in some locations were out of the national guideline due to human activities and MPRL E&P is implementing follow up action to manage the environment as per ECD comments and suggestion. Now we observed that air quality parameter are under the NEQEG guideline in this time survey report. This indicates that the Mann Field operations have no significant impacts on the surrounding environment. Even though future environmental awareness training plans are developed, we are delay to conduct environmental awareness sessions to the community together with ECD and MOGE due to COVID-19 pandemic situation. Furthermore, MPRL E&P is continue improvement of implementing environmental action activities to minimize the impact as per environmental management plan.

16.0 Annex

16.1 HSE Audit Report (Annex A)

16.2 Environmental Monitoring Survey Results (Annex B)

Bi-Annual HSE Audit Report
Annex - A

MPRL E&P Pte Ltd.

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MEMORANDUM

To	:	**GXM / CXM / DCM / TXM**
Reviewed by	:	**PEM / FOM / HSEM**
From	:	**HSE Department**
Date	:	**8th April 2020**
Total Pages	:	**(17) including this page**
Cc	:	**HSE department**

Given cost resilience plan, please carefully check and prioritize actions and plan accordingly.

Subject : Mann Field HSE Bi-Annual Audit – February 2020

We are hereby submitting our findings and recommendations from the Mann Field HSE bi-annual audit for your review and comment.

On 24th and 26th February 2020, HSE team conducted the end-year bi-annual HSE audit of fiscal year 2019~2020 in Mann Filed. The audit team consisted of the following personal:

1 U Sithu Zeya (Assistant HSE Manager)

2 U Win Naing Kyaw (Assistant HSE Manager)

3 U Aung Ko Ko Oo (Assistant HSE Controller)

4 U Zeyar Aung (Assistant HSE Supervisor M&AS)

Yours respectfully

8/4/20

Aung Ko Ko Oo

Assistant HSE Controller

MPRL E&P Pte Ltd.

Contents

Introduction

HSE bi-annual Audit for fiscal year of 2019- 20 was conducted on 24th and 26th of February 2020, to determine the level of health and safety performance in Mann Field operation against the criteria as mentioned in the MPRL E&P approved procedures, MRPL E&P HSEMS and international best practices.

The audit includes the following activities:

1. Reviewing Standard Operating Procedures & JSAs
2. Reviewing the effectiveness in the implementation on previous HSE audit findings
3. Searching potential hazards onsite for both obvious and hidden gaps and substandard practices
4. Reviewing HSE documentation system.
5. Reviewing Preventive & Maintenance Program (Plan Vs Actual)

The primary objective of the audit is to achieve continuous improvements in HSE management system to ensure the worksite continues to provide a safe and healthy environment for staff, members of the surrounding community and also sustainability to the environment.

This report presents the findings and recommendations for the Mann Oil Field as following order:

1. Outstanding previous audit finding
2. Highlighting the improved areas
3. New findings for future improvement
4. Review of Preventive & Maintenance Program
5. Outcome of staff interview
6. Conclusion

1. Outstanding previous audit finding

1.1. Observed that same standby 50kg trolley type extinguisher was deteriorated at its hose (flexible rubber hoses) and also the extinguisher was expired manufacture's warranty at GOCSs.

Observation	Recommendations	Priority Level	Action Parties	Target Date
50 kg extinguishers	• To replace with new fire extinguisher	P2	HSE Dept	50% replace in end of April 2020 and next 50 % replace in end of April 2021

1.2. The audit team found that Down-Hole workshop structure and ceiling condition were unsatisfactory as it can collapse during severe earthquake or strong wind.

Observation	Recommendations	Priority Level	Action Parties	Target Date
Unsafe structure condition	• To coordinate with MOGE to have the down-hole work shop structure repaired as necessary.	P1	Field operation	Facilities of MOGE and On-Going

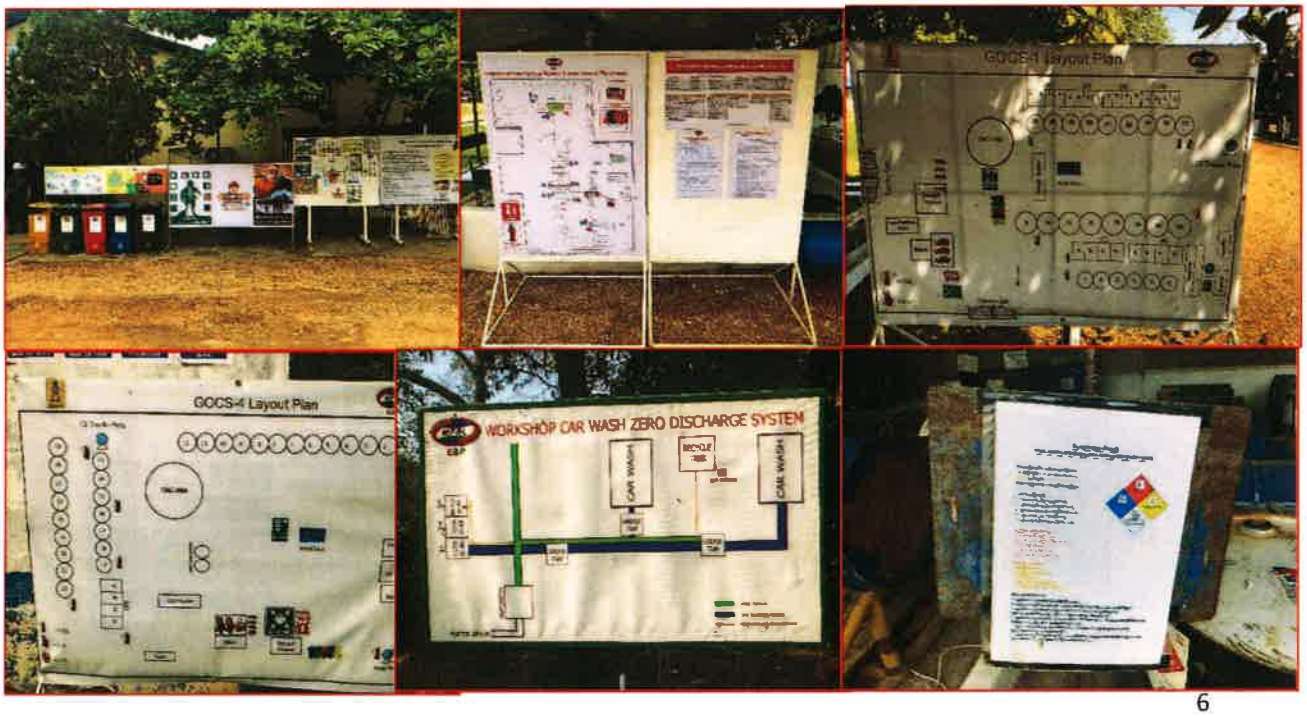
1.3. As a good practice and improvement, the discharge valves from the flow line of the All GOCS relocated 80 % completion. This completely reduced and mitigated the risk of accessing to the dangerous area which has a high potential of falling from height, Moreover, the selected control method follows the priority of the hierarchy of control measures, the engineering control. Audit team appreciated for the improvement of implementation.

Observation	Recommendations	Priority Level	Action Parties	Target Date
Remaining 20 % valves relocation	• This completely reduced and mitigated the risk of accessing to the dangerous area which has a high potential of falling from height	P1	Field operation	30 Sep 2020

2. Highlighting The Improved areas

2.1 As a good practice and improvement, the pumping unit was fenced and barricaded which is closed to the community area, it can prevents potential harm to people or animal from entering into the dangerous area, as a risk reduction and mitigation measure.

2.2 As a good practice and improvement, provision of HSE information board, emergency layout plan and PPE requirement for the difference tasks of operation found at Mann field operation.



2.3 As a good practice and improvement in morning Tool Box Talk meeting, observed that the crews actively participated in the meeting and shared their own experiences effectively. Congratulations to all crews in Mann Field.

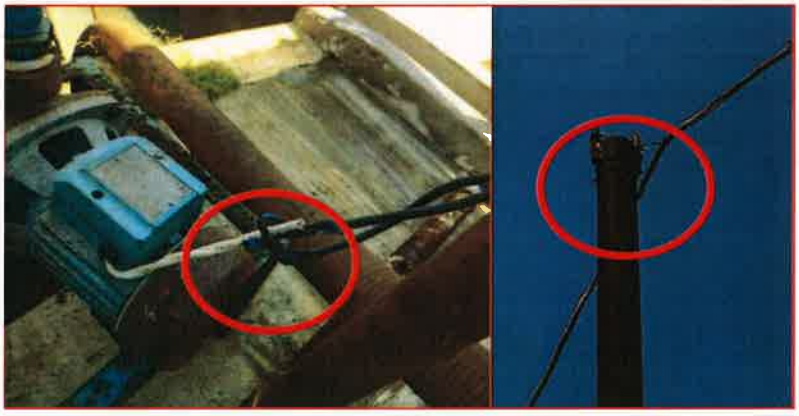
2.4 As a good practice and improvement, emergency drill. Observed the crews are know their roles and responsibilities in an emergency situation as per procedures.

3. New finding for future improvement

3.1. Observed that corrosion pipework at produce water pump in GOCS. It can breakdown piping material due to improper maintenance.

Observation	Recommendations	Priority Level	Action Parties	Target Date
Corrosion pipework at GOCS - 1	• To prevent corrosion by regular maintenance program	P2	Field operation	30 Sep 2020

3.2. Observed that the motor electrical wiring was improperly connected. Wire connection to be made properly. Moreover, audit team observed that the power line and pole are connected directly without using a ceramic insulator and therefore the pole may become a conductor which is an electrical hazard for anyone working nearby.

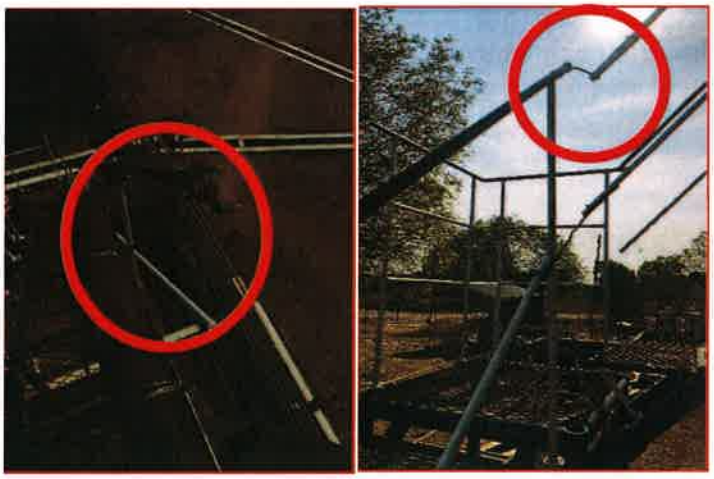


Observation	Recommendations	Priority Level	Action Parties	Target Date
Improper wire connection at GOCS-1	• All improper electrical wire connection to be rectified accordingly as required.	P1	Field operation	Done

3.3. Observed that the oil transfer pump motor unit was contaminated with crude oil. This type of condition is considered as high risk of fire and explosion due to the presence of flammable / explosive atmosphere with potential ignition source (motor itself).

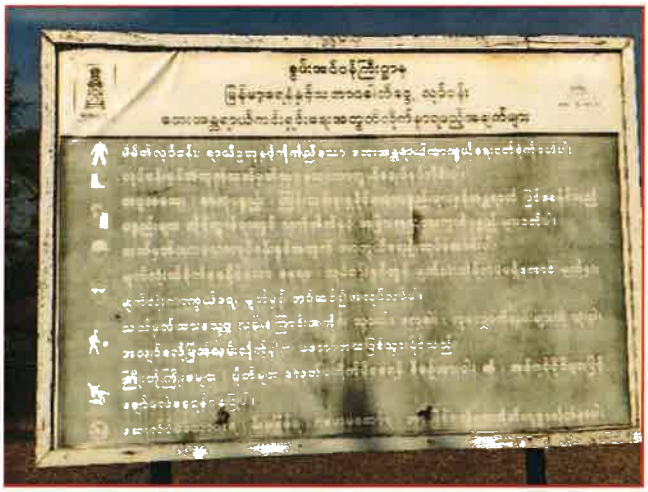
Observation	Recommendations	Priority Level	Action Parties	Target Date
GOCS-2, Bowser Oil Transfer Pump	• Recommend to conduct engineering study and implement the control action to prevent fire and explosion hazard.	P1	Field operation & Engineering	31 March 2021

3.4. Observed that a fabricated handrail at GOCS-5 as unsafe condition. Such kind of substandard measure may lead to an accident or unwanted event.



Observation	Recommendations	Priority Level	Action Parties	Target Date
GOCS-5 Handrail	• To change or rectify the handrail to safe one	P1	Field Operation	30 April 2020

3.5. Observed that safety instruction board at in all GOCS becomes faded. It is a safe guideline by MOGE to protect those whoever entering into the workplace.



Observation	Recommendations	Priority Level	Action Parties	Target Date
GOCS-5	• Need to renew the faded safety instruction board.	P2	MOGE	Facilities of MOGE and On-Going

3.6. Observed that flammable liquid are stored together with oxidizer at Warehouse chemical store. Oxidizers are a severe fire hazard. They are not necessarily combustible, but they can intensify combustion and increase the flammable range for chemicals so they ignite more readily. Audit team also observed that some NFPA rating displayed on the chemical drums does not match with the information from the original safety data sheets, which can lead to wrong estimation of risks related to those chemicals.

Observation	Recommendations	Priority Level	Action Parties	Target Date
Warehouse Chemical Store flammable liquid stored are together with oxidizer	• Oxidizers must be segregated from organic material, flammables, combustibles and strong reducing agents such as zinc, alkaline metals, and formic acid. • To review the whole chemical management storage system at Warehouse.	P2	Warehouse & End-users	30 Sep 2020

3.7. Observed that chemical warehouse wall was made by woven bamboo which itself is a combustible material. Combustible material can be easily ignited and burned if external ignition source is available and applied.

Observation	Recommendations	Priority Level	Action Parties	Target Date
Chemical Warehouse wall	Recommend to replace with gypsum walling which has the best fire resistant rating.	P2	Field Operation	30 Sep 2020

3.8. Observed that working platform above the HSD tanks has unsafe open edge at one side. It can be considered as height work from which major injury or fatal case can be occurred while measuring the oil level as daily basis.

Observation	Recommendations	Priority Level	Action Parties	Target Date
Warehouse HSD tank unsafe opening gaps	• As it is considered as height work and the degree of severity due to falling from that height tends to be major injury or fatal, strongly recommend to take appropriate action to eliminate or mitigate the risk to prevent the occurrence of accident. When taking remedial action for this subject matter, hierarchy of control must be taken into consideration. Meaning, reduction of risk by using PPE should be the last option.	P1	Warehouse	Done

3.9. Observed that zero discharge water is being used without having tested for biological / chemical hazard parameters, which are recycled to use in Warehouse for tubing pressure test, Workshop and Down Hole for other cleaning purpose. It can cause a variety of health effects ranging from skin irritation and allergies to infections due to repeated exposure to personnel with contaminated water.

Observation	Recommendations	Priority Level	Action Parties	Target Date
Biological Hazard in warehouse, workshop and downhole workshop	• Should monitored the quality of discharged with through lab test in order to minimized the impact to exposed workers. Also to stop recycling practice of discharge water is Workshop because it is improper for cleaning purpose.	P1	HSE & Field Team	Stop recycling in workshop is done. Environmental team will keep monitoring as per EMP.

3.10. Observed that full body harness was defected due to excessive oil attack. It is no longer appropriate to use in service. Moreover, due to the maximum height of work, shock absorber is not necessary to decelerate the momentum in fall.


Observation	Recommendations	Priority Level	Action Parties	Target Date
Full body harness	• To replace with new body harness with double lanyard. • After the high work activities, recommend properly stored by keeping it free of moisture, protected from impact and away from extreme temperatures	P1	Field Operation Team	Done

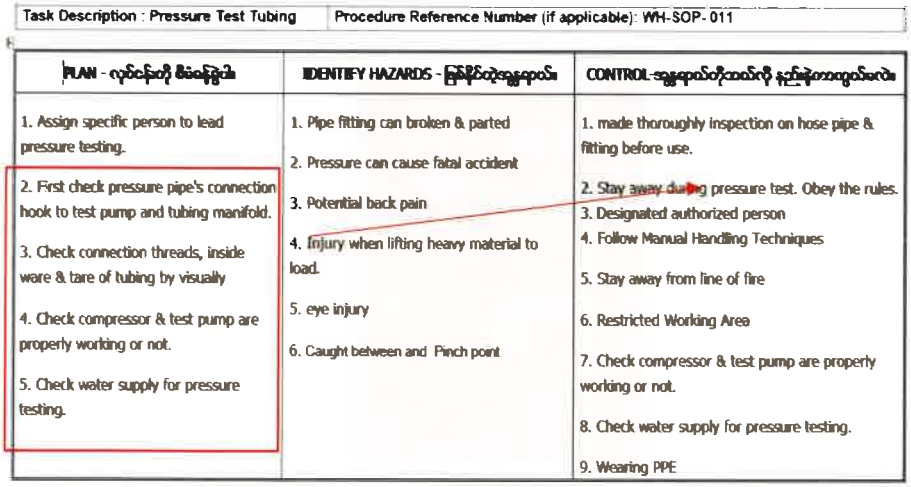
3.11. Observed that fire extinguisher inspection is currently conducted as quarterly basis. However, as per the frequency mentioned in NFPA 10, Section 4-3.1, the inspection to be carried out on monthly basis.

Observation	Recommendations	Priority Level	Action Parties	Target Date
Fire Extinguisher Inspection Frequency	• To increase the frequency of inspection from quarterly to monthly.	P1	HSE	30 April 2020

3.12. Observed that for 35 ton TADANO crane components and lifting equipment visual inspection are carried out quarterly by in house team. However, regular inspections shall be carried out by a competent person. Moreover, there was no annual inspection by third party such as NTD test, load test to ensure the integrity of lifting equipment.

Observation	Recommendations	Priority Level	Action Parties	Target Date
JSA	• Regular inspections shall be carried out by a competent person or third party	P2	HSE & Field Team	30 May 2020

3.13. As a good practice, all sectors have been utilizing JSAs respectively. However, some of JSAs need to be revised due to its informal format, i.e. some of control measures are mentioned in the column of "Plan" instead they should be stated under "Control Measures" column. (See below as sample)



Task Description : Pressure Test Tubing | Procedure Reference Number (if applicable): WH-SOP- 011

PLAN - လုပ်ငန်းတွင် ဆောင်ရွက်ရန်	IDENTIFY HAZARDS - ဖြစ်နိုင်ခြေရှိသော အန္တရာယ်	CONTROL - အန္တရာယ်ကင်းရှင်းစွာ ဆောင်ရွက်ရန် နည်းလမ်းများ
1. Assign specific person to lead pressure testing. 2. First check pressure pipe's connection hook to test pump and tubing manifold. 3. Check connection threads, inside ware & tare of tubing by visually 4. Check compressor & test pump are properly working or not. 5. Check water supply for pressure testing.	1. Pipe fitting can broken & parted 2. Pressure can cause fatal accident 3. Potential back pain 4. Injury when lifting heavy material to load. 5. eye injury 6. Caught between and Pinch point	1. made thoroughly inspection on hose pipe & fitting before use. 2. Stay away during pressure test. Obey the rules. 3. Designated authorized person 4. Follow Manual Handling Techniques 5. Stay away from line of fire 6. Restricted Working Area 7. Check compressor & test pump are properly working or not. 8. Check water supply for pressure testing. 9. Wearing PPE

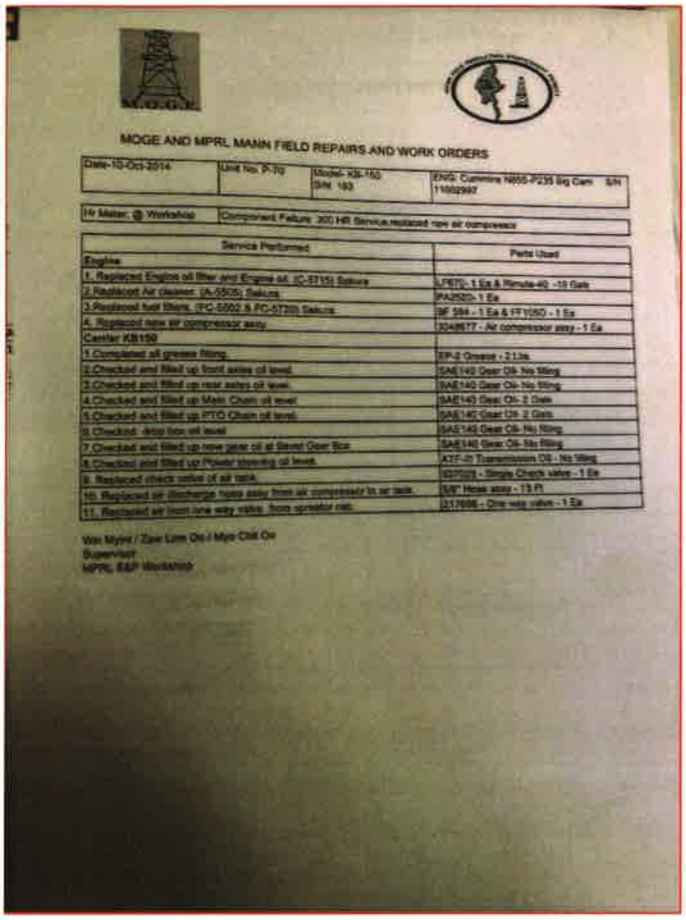
Observation	Recommendations	Priority Level	Action Parties	Target Date
JSA	• To review and update JSA	P1	HSE & Field Operation	Done

3.14. As a good practice and improvement, the camp kitchen was provided a fire alarm and emergency gas shut off valve. However, there was no proper signage for the provision of emergency facilities.

Observation	Recommendations	Priority Level	Action Parties	Target Date
Proper Sign	• To provide proper sign for fire alarm and emergency gas shut off valve. • To train all related crews on the use of those provision measures.	P2	Field Operation Team	30 Apr 2020

4. Review of Preventive & Maintenance Program

4.1 Audit team checked the PM schedule of MPRL E&P workshop and Downhole workshop. Observed that team performed as per planned schedules in place at respective workshops and updated accordingly. Congratulated field team for this practice and keep it up the practice consistently.



5. Staff Interview

During the period of HSE audit, crews were randomly selected and interviewed to evaluate their safety awareness level, the level of understanding on the standard operating procedures and necessary control measures as mentioned in the respective JSAs and familiarity with emergency response plan. (See Below Figures)

6. Conclusion

As to summarize and conclude this bi-annual HSE audit report, audit team observed that improvement in documentation, practices, follow the procedure (SOP/JSA), crew awareness in safety and environment in Mann Field operation. However some areas included in this report for further improvement on which field team should focus and take necessary action in the aspects of health, safety and environment in Mann Field.

Survey Results
Annex - B

ပတ်ဝန်းကျင်ရေးရာဓာတ်ခွဲခန်း

Ecological Laboratory

စိမ်းလန်းအမိမြေဖွံ့ဖြိုးတိုးတက်ရေးအသင်း (Advancing Life and Regenerating Motherland, ALARM)

Reference Number/ စာအမှတ်: EL-R /335

Date / နေ့စွဲ: 5 Aug, 2020

Air Analysis Report (လေတိုင်းတာ စစ်ဆေးမှု အစီအရင်ခံစာ)

Air Analysis Info / လေတိုင်းတာမှု အချက်အလက်

လေတိုင်းသည့်နေရာ Sample site:	Z1AQN	လေနမူနာအမှတ်စဉ်Sample I.D.	340	
နေရာ (မြို့နယ်) Location (township)	Located in Pauk Su village, Pwint Phyu Township	လတ်တီတွဒ် Latitude	N 20° 19′ 39.0″	
		လောင်ဂျီတွဒ် Longitude	E 094° 49′ 18.4″	
နေရာ (တိုင်းပြည်နယ်) Location (Region / state)	Magway Region	နည်းစဉ် Method	Haz-Scanner (EPAS)	
		စက်တည်အမြင့်(မြေပြင်မှ) Station height (above ground)	Ground (Outdoor Air Quality Testing)	
တိုင်းတာလိုသူ အမည် Name of customer:	MPRL E&P Pte Ltd.	စတင်တိုင်းတာသည့်ချိန် (နေ့အချိန်) log on time (Date,Time)	25.7.2020	3:21 PM
တိုင်းတာသည့်နေ့စွဲ Air Sampling Testing Date	25.7.2020	တိုင်းတာပြီးသည့်အချိန်(နေ့အချိန်) log off time (Date,Time)	26.7.2020	3:21 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	84.79	$\mu g/m^3$ $\mu g/m^3$	1	year hour	*40 $\mu g/m^3$ * 200 $\mu g/m^3$	1-year 1-hour
၂	Particulate matter PM_{10}	14.88	$\mu g/m^3$ $\mu g/m^3$	24	year hours	*20 $\mu g/m^3$ * 50 $\mu g/m^3$	1-year 24-hour
၃	Particulate matter $PM_{2.5}$	7.43	$\mu g/m^3$ $\mu g/m^3$	24	year hours	* 10 $\mu g/m^3$ * 25 $\mu g/m^3$	1-year 24 hour
၄	ဆာလဖာဒိုင်အောက်ဆိုဒ် Sulfur Dioxide	50.52	$\mu g/m^3$ $\mu g/m^3$	10	hours min	* 20 $\mu g/m^3$ * 500 $\mu g/m^3$	24-hour 10 minute
၅	အိုဇုန်း Ozone	46.05	$\mu g/m^3$ $\mu g/m^3$	8	year hours	* 100 $\mu g/m^3$	8 Hour Daily Maximum
၆	ကာဗွန်ဒိုင်အောက်ဆိုဒ် Carbon dioxide	101.18	ppm ppm	24	year hours	NG	-
၇	ကာဗွန်မိုနောက်ဆိုဒ် Carbon monoxide	161.78	ppb ppb	24	year hours	NG	-

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Email: info@alarmmyanmar.org, alarm.myanmar@gmail.com , Website: www.alarmmyanmar.org

ပတ်ဝန်းကျင်ရေးရာဓာတ်ခွဲခန်း
Ecological Laboratory

စိမ်းလန်းအဓိမြေဖွံ့ဖြိုးတိုးတက်ရေးအသင်း (Advancing Life and Regenerating Motherland, ALARM)

စဉ် No.	အရည်အသွေး Parameter	ရလဒ် Results	ယူနစ် Unit	ပျမ်းမျှကာလ Avg. Period		ထုတ်လွှတ်မှုစံနှုန်း Guideline Value	ပျမ်းမျှကာလ Avg. Period
၈	ဟိုက်ဒရိုကာဗွန် Hydrocarbon		ppm		hour		
		12.16	ppm	24	hours	NG	-
၉	မီသိန်း Methane		ppm		hour		
		35.08	ppm	24	hours	NG	-
၁၀	ရေဒီယိုသတ္တိကြွ Atomic Radiation		CPM		hour		
		11.52	CPM	24	hours	NG	-
၁၁	အပူချိန် Temperature		°C		hour		
		32.58	°C	24	hours	NG	-
၁၂	Volatile Organic Compound (VOC)		ppb		hour		
		0.49	ppb	24	hours	NG	-
၁၃	လေတိုက်နှုန်း Wind Speed		Kph		hour		
		0.97	Kph	24	hours	NG	-
၁၄	လေတိုက်ရာအရပ် Wind Direction		Deg		hour		
		165.69	Deg	24	hours	NG	-
၁၅	စိုထိုင်းဆ Relative Humidity		RH%		hour		
		58.24	RH%	24	hours	NG	-

* Myanmar Environmental Quality Emission Guideline 2015 NG= No Guideline

မှတ်ချက်။ ။တိုင်းတာသည့်ကြာချိန်သည် သတ်မှတ်စံနှုန်းအချိန်ထက်နည်းပါက အများဆုံးတိုင်းတာခဲ့သည့်အချိန်၏ ပျမ်းမျှရလဒ်ကိုသာဇော်ပြထားပါသည်။

သတ်မှတ်စံနှုန်းအချိန်ထက် ပိုမိုတိုင်းတာထားသောအရည်အသွေးများအတွက် သတ်မှတ်အချိန် ပျမ်းမျှရလဒ်များ၏ အများဆုံးရလဒ်တစ်ခုသာဇော်ပြထားပါသည်။

တိုင်းတာတွက်ချက်သူ
Analyzed by
Kyaw Thu Htein
Assistant Technician
Ecological Laboratory
ALARM

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Checked by
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ပတ်ဝန်းကျင်ဂေဒရာတော်ခွဲခန်း
Ecological Laboratory

စိမ်းလန်းအမိမြေဖွံ့ဖြိုးတိုးတက်ရေးအသင်း (Advancing Life and Regenerating Motherland, ALARM)

Reference Number/ စာအမှတ်: EL-R /334

Date / နေ့စွဲ: 5 Aug, 2020

Air Analysis Report (လေတိုင်းတာ စစ်ဆေးမှု အစီအရင်ခံစာ)

Air Analysis Info / လေတိုင်းတာမှု အချက်အလက်

လေတိုင်းသည့်နေရာ Sample site:	Z2AQN	လေနမူနာအမှတ်စဉ်Sample I.D.	339	
နေရာ (မြို့နယ်) Location (township)	Located in Fire station compound, Kyauk san village, Minbu Township	လက်တီတွဒ် Latitude	N 20° 15′ 40.6″	
		လောင်ဂျီတွဒ် Longitude	E 094° 50′ 08.0″	
နေရာ (တိုင်းပြည်နယ်) Location (Region / state)	Magway Region	နည်းစဉ် Method	Haz-Scanner (EPAS)	
		စက်တည်အမြင့်(မြေပြင်မှ) Station height (above ground)	Ground (Outdoor Air Quality Testing)	
တိုင်းတာလိုသူ အမည် Name of customer:	MPRL E&P Pte Ltd.	စတင်တိုင်းတာသည့်ချိန် (နေ့၊အချိန်) log on time (Date,Time)	24.7.2020	12:27 PM
တိုင်းတာသည့်နေ့စွဲ Air Sampling Testing Date	24.7.2020	တိုင်းတာပြီးသည့်အချိန်(နေ့၊အချိန်) log off time (Date,Time)	25.7.2020	12:27 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	186.78	µg/m³ µg/m³	1	year hour	*40 µg/m³ * 200 µg/m³	1-year 1-hour
၂	Particulate matter PM 10	19.75	µg/m³ µg/m³	24	year hours	*20 µg/m³ * 50 µg/m³	1-year 24-hour
၃	Particulate matter PM 2.5	6.83	µg/m³ µg/m³	24	year hours	* 10 µg/m³ * 25 µg/m³	1-year 24 hour
၄	ဆာလဖာဒိုင်အောက်ဆိုဒ် Sulfur Dioxide	202.34	µg/m³ µg/m³	10	hours min	* 20 µg/m³ * 500 µg/m³	24-hour 10 minute
၅	အိုဇုန်း Ozone	47.45	µg/m³ µg/m³	8	year hours	* 100 µg/m³	8 Hour Daily Maximum
၆	ကာဗွန်ဒိုင်အောက်ဆိုဒ် Carbon dioxide	102.82	ppm ppm	24	year hours	NG	-
၇	ကာဗွန်မိုနောက်ဆိုဒ် Carbon monoxide	146.02	ppb ppb	24	year hours	NG	-

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စိမ်းလန်းအဓိမြေဖွံ့ဖြိုးတိုးတက်ရေးအသင်း (Advancing Life and Regenerating Motherland, ALARM)

စဉ် No.	အရည်အသွေး Parameter	ရလဒ် Results	ယူနစ် Unit	ပျမ်းမျှကာလ Avg. Period		ထုတ်လွှတ်မှုစံနှုန်း Guideline Value	ပျမ်းမျှကာလ Avg. Period
၈	ဟိုက်ဒရိုကာဗွန် Hydrocarbon		ppm		hour		
		12.82	ppm	24	hours	NG	-
၉	မီသိန်း Methane		ppm		hour		
		20.54	ppm	24	hours	NG	-
၁၀	ရေဒီယိုသတ္တိကြွ Atomic Radiation		CPM		hour		
		17.41	CPM	24	hours	NG	-
၁၁	အပူရိန် Temperature		°C		hour		
		37.11	°C	24	hours	NG	-
၁၂	Volatile Organic Compound (VOC)		ppb		hour		
		0.21	ppb	24	hours	NG	-
၁၃	လေတိုက်နှုန်း Wind Speed		Kph		hour		
		0.19	Kph	24	hours	NG	-
၁၄	လေတိုက်ရာအရပ် Wind Direction		Deg		hour		
		120.38	Deg	24	hours	NG	-
၁၅	စိုထိုင်းဆ Relative Humidity		RH%		hour		
		62.52	RH%	24	hours	NG	-

* Myanmar Environmental Quality Emission Guideline 2015 NG= No Guideline

မှတ်ချက်။ ။တိုင်းတာသည့်ကြာရှိန်သည် သတ်မှတ်စံနှုန်းအရှိန်ထက်နည်းပါက အများဆုံးတိုင်းတာခဲ့သည့်အရှိန်၏ ပျမ်းမျှရလဒ်ကိုသာဖော်ပြထားပါသည်။

သတ်မှတ်စံနှုန်းအရှိန်ထက် ပိုမိုတိုင်းတာထားသောအရည်အသွေးများအတွက် သတ်မှတ်အရှိန် ပျမ်းမျှရလဒ်များ၏ အများဆုံးရလဒ်တစ်ခုသာဖော်ပြထားပါသည်။

တိုင်းတာတွက်ချက်သူ
Analyzed by

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စစ်ဆေးသူ
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Reference Number/ စာအမှတ်: EL-R /332

Date / နေ့စွဲ: 5 Aug, 2020

Air Analysis Report (လေတိုင်းတာ စစ်ဆေးမှု အစီအရင်ခံစာ)

Air Analysis Info / လေတိုင်းတာမှု အချက်အလက်

လေတိုင်းသည့်နေရာ Sample site:	Z3AQN	လေနမူနာအမှတ်စဉ်Sample I.D.	337	
နေရာ (မြို့နယ်) Location (township)	Near the M-89, Minbu Township	လက်တီတွဒ် Latitude	N 20° 13′ 21.5″	
		လောင်ဂျီတွဒ် Longitude	E 094° 51′ 19.6″	
နေရာ (တိုင်းပြည်နယ်) Location (Region / state)	Magway Region	နည်းစဉ် Method	Haz-Scanner (EPAS)	
		စက်တည်အမြင့်(မြေပြင်မှ) Station height (above ground)	Ground (Outdoor Air Quality Testing)	
တိုင်းတာလိုသူ အမည် Name of customer:	MPRL E&P Pte Ltd.	စတင်တိုင်းတာသည့်ချိန် (နေ့၊အချိန်) log on time (Date,Time)	22.7.2020	7:38 AM
တိုင်းတာသည့်နေ့စွဲ Air Sampling Testing Date	22.7.2020	တိုင်းတာပြီးသည့်အချိန်(နေ့၊အချိန်) log off time (Date,Time)	23.7.2020	7:38 AM
ဆက်သွယ်ရန် လိပ်စာ/ဖုန်း Contact Address/phone	-	တိုင်းတာမှု ကြာချိန် Logging Duration (hours)	24 hours	

Air testing result / လေထုတိုင်းတာစမ်းသပ်ချက်အဖြေ

စဉ် No.	အရည်အသွေး Parameter	ရလဒ် Results	ယူနစ် Unit		ပျမ်းမျှကာလ Avg. Period	ထုတ်လွှတ်မှုစံနှုန်း Guideline Value	ပျမ်းမျှကာလ Avg. Period
၁	နိုက်ထရိုဂျင်ဒိုင်အောက်ဆိုဒ် Nitrogen dioxide	102.96	µg/m³ µg/m³	year hour	1	*40 µg/m³ * 200 µg/m³	1-year 1-hour
၂	Particulate matter PM 10	38.08	µg/m³ µg/m³	year hours	24	*20 µg/m³ * 50 µg/m³	1-year 24-hour
၃	Particulate matter PM 2.5	5.22	µg/m³ µg/m³	year hours	24	* 10 µg/m³ * 25 µg/m³	1-year 24 hour
၄	ဆာလဖာဒိုင်အောက်ဆိုဒ် Sulfur Dioxide	63.35	µg/m³ µg/m³	hours min	10	* 20 µg/m³ * 500 µg/m³	24-hour 10 minute
၅	အိုဇုန်း Ozone	38.93	µg/m³ µg/m³	year hours	8	* 100 µg/m³	8 Hour Daily Maximum
၆	ကာဗွန်ဒိုင်အောက်ဆိုဒ် Carbon dioxide	99.71	ppm ppm	year hours	24	NG	-
၇	ကာဗွန်မိုနောက်ဆိုဒ် Carbon monoxide	50.89	ppb ppb	year hours	24	NG	-

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စဉ် No.	အရည်အသွေး Parameter	ရလဒ် Results	ယူနစ် Unit	ပျမ်းမျှကာလ Avg. Period		ထုတ်လွှတ်မှုစံနှုန်း Guideline Value	ပျမ်းမျှကာလ Avg. Period
၈	ဟိုက်ဒရိုကာဗွန် Hydrocarbon		ppm		hour		
		13.09	ppm	24	hours	NG	-
၉	မီသိန်း Methane		ppm		hour		
		14.59	ppm	24	hours	NG	-
၁၀	ရေဒီယိုသတ္တိကြွ Atomic Radiation		CPM		hour		
		8.66	CPM	24	hours	NG	-
၁၁	အပူချိန် Temperature		°C		hour		
		35.17	°C	24	hours	NG	-
၁၂	Volatile Organic Compound (VOC)		ppb		hour		
		2.53	ppb	24	hours	NG	-
၁၃	လေတိုက်နှုန်း Wind Speed		Kph		hour		
		5.68	Kph	24	hours	NG	-
၁၄	လေတိုက်ရာအရပ် Wind Direction		Deg		hour		
		137.40	Deg	24	hours	NG	-
၁၅	စိုထိုင်းဆ Relative Humidity		RH%		hour		
		63.04	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 /333

Date / နေ့စွဲ: 5 Aug, 2020

Air Analysis Report (လေတိုင်းတာ စစ်ဆေးမှု အစီအရင်ခံစာ)

Air Analysis Info / လေတိုင်းတာမှု အချက်အလက်

လေတိုင်းသည့်နေရာ Sample site:	Z4AQN	လေနမူနာအမှတ်စဉ်Sample I.D.	338	
နေရာ (မြို့နယ်) Location (township)	In the compound of MDE-1(M-668) close to the western bank of Ayeyarwady River , Minbu Township	လက်တီတွဒ် Latitude	N 20° 11′ 41.9″	
		လောင်ဂျီတွဒ် Longitude	E 094° 52′ 32.40″	
နေရာ (တိုင်းပြည်နယ်) Location (Region / state)	Magway Region	နည်းစဉ် Method	Haz-Scanner (EPAS)	
		စက်တည်အမြင့်(မြေပြင်မှ) Station height (above ground)	Ground (Outdoor Air Quality Testing)	
တိုင်းတာလိုသူ အမည် Name of customer:	MPRL E&P Pte Ltd.	စတင်တိုင်းတာသည့်ချိန် (နေ့၊အချိန်) log on time (Date,Time)	23.7.2020	9:27 AM
တိုင်းတာသည့်နေ့စွဲ Air Sampling Testing Date	23.7.2020	တိုင်းတာပြီးသည့်အချိန်(နေ့၊အချိန်) log off time (Date,Time)	24.7.2020	9:27 AM
ဆက်သွယ်ရန် လိပ်စာ/ဖုန်း Contact Address/phone	-	တိုင်းတာမှု ကြာချိန် Logging Duration (hours)	24 hours	

Air testing result / လေထုတိုင်းတာစမ်းသပ်ချက်အဖြေ

စဉ် No.	အရည်အသွေး Parameter	ရလဒ် Results	ယူနစ် Unit	ပျမ်းမျှကာလ Avg. Period		ထုတ်လွှတ်မှုစံနှုန်း Guideline Value	ပျမ်းမျှကာလ Avg. Period
၁	နိုက်ထရိုဂျင်ဒိုင်အောက်ဆိုဒ် Nitrogen dioxide	101.14	µg/m³ µg/m³	1	year hour	*40 µg/m³ * 200 µg/m³	1-year 1-hour
၂	Particulate matter PM 10	23.51	µg/m³ µg/m³	24	year hours	*20 µg/m³ * 50 µg/m³	1-year 24-hour
၃	Particulate matter PM 2.5	6.84	µg/m³ µg/m³	24	year hours	* 10 µg/m³ * 25 µg/m³	1-year 24 hour
၄	ဆာလဖာဒိုင်အောက်ဆိုဒ် Sulfur Dioxide	138.21	µg/m³ µg/m³	10	hours min	* 20 µg/m³ * 500 µg/m³	24-hour 10 minute
၅	အိုဇုန်း Ozone	51.59	µg/m³ µg/m³	8	year hours	* 100 µg/m³	8 Hour Daily Maximum
၆	ကာဗွန်ဒိုင်အောက်ဆိုဒ် Carbon dioxide	103.38	ppm ppm	24	year hours	NG	-
၇	ကာဗွန်မိုနောက်ဆိုဒ် Carbon monoxide	122.71	ppb ppb	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
၈	ဟိုက်ဒရိုကာဗွန် Hydrocarbon		ppm		hour		
		12.83	ppm	24	hours	NG	-
၉	မီသိန်း Methane		ppm		hour		
		7.16	ppm	24	hours	NG	-
၁၀	ရေဒီယိုသတ္တိကြွ Atomic Radiation		CPM		hour		
		17.72	CPM	24	hours	NG	-
၁၁	အပူချိန် Temperature		°C		hour		
		35.32	°C	24	hours	NG	-
၁၂	Volatile Organic Compound (VOC)		ppb		hour		
		6.75	ppb	24	hours	NG	-
၁၃	လေတိုက်နှုန်း Wind Speed		Kph		hour		
		0.20	Kph	24	hours	NG	-
၁၄	လေတိုက်ရာအရပ် Wind Direction		Deg		hour		
		120.29	Deg	24	hours	NG	-
၁၅	စိုထိုင်းဆ Relative Humidity		RH%		hour		
		64.18	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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Noise Analysis Info / အသံတိုင်းတာမှု အချက်အလက်

လေတိုင်းသည့်နေရာ Sample site:	Z1AQN	လေနမူနာအမှတ်စဉ်Sample I.D	010	
နေရာ (မြို့နယ်) Location (township)	Located in Pauk Su village, Pwint Phyu Township	လက်တီတွဒ် Latitude	N 20° 19′ 39.0″	
		လောင်ဂျီတွဒ် Longitude	E 094° 49′ 18.4″	
နေရာ (တိုင်းပြည်နယ်) Location (Region / state)	Magway Region	နည်းစဉ် Method	BENETECH Digital Sound Level Meter	
တိုင်းတာလိုသူ အမည် Name of customer:	MPRL E&P Pte Ltd.	စတင်တိုင်းတာသည့်ရိုန် (နေ့၊အချိန်) log on time (Date,Time)	25.7.2020	3:21 PM
တိုင်းတာသည့်နေ့စွဲ Air Sampling Testing Date	25.7.2020	တိုင်းတာပြီးသည့်အချိန်(နေ့၊အချိန်) log off time (Date,Time)	26.7.2020	3:21 PM
ဆက်သွယ်ရန် လိပ်စာ/ဖုန်း Contact Address/phone	-	တိုင်းတာမှု ကြာချိန် Logging Duration (hours)	24 hours	

Noise Testing Result /အသံတိုင်းတာစမ်းသပ်ချက်အဖြေ

Testing Time	Testing Results (One Hour Average)	Guideline Value (NEQG)*		
Day -Time	Unit – dBA	One Hour LAeq (dBA)**		
7:00-8:00	56.11	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	54.05			
9:00-10:00	51.64			
10:00-11:00	50.62			
11:00-12:00	47.89	Residential, Institutional Educational	55	45
12:00-13:00	47.28			
13:00-14:00	44.39			
14:00-15:00	46.47			
15:00-16:00	54.12			
16:00-17:00	53.88	Industrial, Commercial	70	70
17:00-18:00	49.36			
18:00-19:00	52.38			
19:00-20:00	53.19			
20:00-21:00	57.68			
21:00-22:00	57.75			
Day-Time Average (LAeq)	51.79			

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Ecological Laboratory

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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	58.49	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	58.39			
00:00-1:00	58.50			
1:00-2:00	57.96			
2:00-3:00	59.10	Residential, Institutional Educational	55	45
3:00-4:00	59.18			
4:00-5:00	58.44			
5:00-6:00	62.18	Industrial, Commercial	70	70
6:00-7:00	55.74			
Night-Time Average (LAeq)	58.88			

*Myanmar Environmental Quality Emission Guideline 2015

**Equivalent continuous sound level in decibels

တိုင်းတာတွက်ချက်သူ
Analyzed by

Kyaw Thu Win
Assistant Technician
Ecological Laboratory
ALARM

စစ်ဆေးသူ
Checked by

Dr. Aye Aye Win
Laboratory In-Charge
Ecological Laboratory
(ALARM)

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Noise Analysis Info / အသံတိုင်းတာမှု အချက်အလက်

လေတိုင်းသည့်နေရာ Sample site:	Z2AQN	လေနမူနာအမှတ်စဉ်Sample I.D	009	
နေရာ (မြို့နယ်) Location (township)	Located in Fire station compound, Kyauk San village, Minbu Township	လက်တီတွဒ် Latitude	N 20° 15′ 40.6″	
		လောင်ဂျီတွဒ် Longitude	E 094° 50′ 08.0″	
နေရာ (တိုင်းပြည်နယ်) Location (Region / state)	Magway Region	နည်းစဉ် Method	BENETECH Digital Sound Level Meter	
တိုင်းတာလိုသူ အမည် Name of customer:	MPRL E&P Pte Ltd.	စတင်တိုင်းတာသည့်ချိန် (နေ့၊အချိန်) log on time (Date,Time)	24.7.2020	12:27 PM
တိုင်းတာသည့်နေ့စွဲ Air Sampling Testing Date	24.7.2020	တိုင်းတာပြီးသည့်အချိန်(နေ့၊အချိန်) log off time (Date,Time)	25.7.2020	12:27 PM
ဆက်သွယ်ရန် လိပ်စာ/ဖုန်း Contact Address/phone	-	တိုင်းတာမှု ကြာချိန် Logging Duration (hours)	24 hours	

Noise Testing Result /အသံတိုင်းတာစမ်းသပ်ချက်အဖြေ

Testing Time	Testing Results (One Hour Average)	Guideline Value (NEQG)*		
Day -Time	Unit – dBA	One Hour LAeq (dBA)**		
7:00-8:00	57.03	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	52.74			
9:00-10:00	51.66			
10:00-11:00	47.83			
11:00-12:00	49.26	Residential, Institutional Educational	55	45
12:00-13:00	53.16			
13:00-14:00	51.71			
14:00-15:00	47.96			
15:00-16:00	49.15			
16:00-17:00	50.55	Industrial, Commercial	70	70
17:00-18:00	51.14			
18:00-19:00	57.52			
19:00-20:00	59.45			
20:00-21:00	56.56			
21:00-22:00	58.32			
Day-Time Average (LAeq)	52.93			

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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	58.49	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	58.39			
00:00-1:00	58.50			
1:00-2:00	57.96			
2:00-3:00	59.10	Residential, Institutional Educational	55	45
3:00-4:00	59.18			
4:00-5:00	58.44			
5:00-6:00	62.18	Industrial, Commercial	70	70
6:00-7:00	55.74			
Night-Time Average (LAeq)	58.66			

*Myanmar Environmental Quality Emission Guideline 2015

**Equivalent continuous sound level in decibels

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Analyzed by
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Assistant Technician
Ecological Laboratory
ALARM

စစ်ဆေးသူ
Checked by
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Noise Analysis Info / အသံတိုင်းတာမှု အချက်အလက်

ဧလတိုင်းသည့်နေရာ Sample site:	Z3AQN	လေနမူနာအမှတ်စဉ်Sample I.D	007	
နေရာ (မြို့.နယ်) Location (township)	Near the M-89, Minbu Township	လက်တီတွဒ် Latitude	N 20° 13′ 21.5″	
		လောင်ဂျီတွဒ် Longitude	E 094° 51′ 19.6″	
နေရာ (တိုင်းဒေသကြီးနယ်) Location (Region / state)	Magway Region	နည်းစဉ် Method	BENETECH Digital Sound Level Meter	
တိုင်းတာလိုသူ အမည် Name of customer:	MPRL E&P Pte Ltd.	စတင်တိုင်းတာသည့်ချိန် (နေ့၊အချိန်) log on time (Date,Time)	22.7.2020	7:38 AM
တိုင်းတာသည့်နေ့စွဲ Air Sampling Testing Date	22.7.2020	တိုင်းတာပြီးသည့်အချိန်(နေ့၊အချိန်) log off time (Date,Time)	23.7.2020	7:38 AM
ဆက်သွယ်ရန် လိပ်စာ/ဖုန်း Contact Address/phone	-	တိုင်းတာမှု ကြာချိန် Logging Duration (hours)	24 hours	

Noise Testing Result /အသံတိုင်းတာစမ်းသပ်ချက်အဖြေ

Testing Time	Testing Results (One Hour Average)	Guideline Value (NEQG)*		
Day -Time	Unit – dBA	One Hour LAeq (dBA)**		
7:00-8:00	55.95	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	55.56			
9:00-10:00	54.57			
10:00-11:00	54.40			
11:00-12:00	53.33	Residential, Institutional Educational	55	45
12:00-13:00	52.76			
13:00-14:00	52.20			
14:00-15:00	52.27			
15:00-16:00	51.84			
16:00-17:00	55.58	Industrial, Commercial	70	70
17:00-18:00	56.14			
18:00-19:00	54.92			
19:00-20:00	54.52			
20:00-21:00	57.15			
21:00-22:00	57.63			
Day-Time Average (LAeq)	54.58			

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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	56.31	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	54.51			
00:00-1:00	53.63			
1:00-2:00	53.20			
2:00-3:00	53.18	Residential, Institutional Educational	55	45
3:00-4:00	53.25			
4:00-5:00	53.44			
5:00-6:00	55.70	Industrial, Commercial	70	70
6:00-7:00	53.79			
Night-Time Average (LAeq)	54.11			

*Myanmar Environmental Quality Emission Guideline 2015

**Equivalent continuous sound level in decibels

တိုင်းတာတွက်ချက်သူ
Analyzed by

Kyaw Thu Sein
Assistant Technician
Ecological Laboratory
ALARM

စစ်ဆေးသူ
Checked by

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Noise Analysis Info / အသံတိုင်းတာမှု အချက်အလက်

လေတိုင်းသည့်နေရာ Sample site:	Z4AQN	လေနမူနာအမှတ်စဉ်Sample I.D	008	
နေရာ (မြို့.နယ်) Location (township)	In the compound of MDE-1 (M668),close to the western bank of Ayeyarwady River	လက်တီတွဒ် Latitude	N 20° 11′ 39.0″	
		လောင်ဂိုတွဒ် Longitude	E 094°52′ 32.40″	
နေရာ (တိုင်းပြည်နယ်) Location (Region / state)	Magway Region	နည်းစဉ် Method	BENETECH Digital Sound Level Meter	
တိုင်းတာလိုသူ အမည် Name of customer:	MPRL E&P Pte Ltd.	စတင်တိုင်းတာသည့်ချိန် (နေ့၊အချိန်) log on time (Date,Time)	23.7.2020	9:27 AM
တိုင်းတာသည့်နေ့စွဲ Air Sampling Testing Date	23.7.2020	တိုင်းတာပြီးသည့်အချိန်(နေ့၊အချိန်) log off time (Date,Time)	24.7.2020	9:27 AM
ဆက်သွယ်ရန် လိပ်စာ/ဖုန်း Contact Address/phone	-	တိုင်းတာမှု ကြာချိန် Logging Duration (hours)	24 hours	

Noise Testing Result /အသံတိုင်းတာစမ်းသပ်ချက်အဖြေ

Testing Time	Testing Results (One Hour Average)	Guideline Value (NEQG)*		
Day -Time	Unit – dBA	One Hour LAeq (dBA)**		
7:00-8:00	52.04	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	52.21			
9:00-10:00	51.66			
10:00-11:00	53.22			
11:00-12:00	51.67	Residential, Institutional Educational	55	45
12:00-13:00	49.53			
13:00-14:00	48.84			
14:00-15:00	48.39			
15:00-16:00	54.12			
16:00-17:00	57.04	Industrial, Commercial	70	70
17:00-18:00	53.19			
18:00-19:00	51.99			
19:00-20:00	53.32			
20:00-21:00	58.34			
21:00-22:00	53.21			
Day-Time Average (LAeq)	52.58			

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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	59.83	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	58.73			
00:00-1:00	57.92			
1:00-2:00	54.74			
2:00-3:00	55.02	Residential, Institutional Educational	55	45
3:00-4:00	55.65			
4:00-5:00	54.53			
5:00-6:00	54.44	Industrial, Commercial	70	70
6:00-7:00	51.89			
Night-Time Average (LAeq)	55.86			

*Myanmar Environmental Quality Emission Guideline 2015

**Equivalent continuous sound level in decibels

တိုင်းတာတွက်ချက်သူ
Analyzed by

Kyaw Phyo Sein
Assistant Technician
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ALARM

စစ်ဆေးသူ
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စာအမှတ်/Reference Number: EL (M)-R / 389

နေ့စွဲ/Date: 4th August, 2020

ဓာတ်ခွဲစစ်ဆေးမှုအစီအရင်ခံစာ/Laboratory Analysis Report

နမူနာရာဇဝင် /Sample Profile

နမူနာအမည် /Sample Name	Z1SW-1 (Surface water)	နမူနာအမှတ် / Sample ID	389	
နေရာ (မြို့နယ်) Location (Township)	Mone Chaung, Pauk Su Village	လတ္တီတွဒ် Latitude	20° 19′ 47.67″ N	
နေရာ (တိုင်း/ပြည်နယ်) Location (Region/State)		လောင်ဂျီတွဒ် Longitude	94° 49′ 6.88″ E	
ပေးပို့သူအမည် /Sender Name	MPRL E&P Pte Ltd.	နမူနာကောက်ယူချိန် (နေ့၊ နာရီ) Sampling Time (Date, Time)	26.7.2020	8:25 AM
အဖွဲ့အစည်း /Organisation	MPRL E&P Pte Ltd.			
ဆက်သွယ်ရန် /Contact	09449001927	နမူနာရောက်ရှိချိန် (နေ့၊ နာရီ) Arriving Time (Date, Time)	29.7.2020	

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

Analysis Results/စမ်းသပ်ချက်အဖြေ

စဉ် Sr.	အရည်အသွေးညွှန်းကိန်း Quality Parameter	ရလဒ် အဖြေ 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)	1100	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)	3000	3M Pate count method	0	
7	Total *E.coli* count (CFU/ml)	10	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 Myat Nyein Research Assistant ALARM	Htun Inzali Research Assistant ALARM	Dr. Nitar Nwe Research Scientist Ecological Laboratory ALARM

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စာအမှတ်/Reference Number: EL (M)-R / 382

နေ့စွဲ/Date: 4th August, 2020

ဓာတ်ခွဲစစ်ဆေးမှုအစီအရင်ခံစာ/Laboratory Analysis Report

နမူနာရာဇဝင် /Sample Profile

နမူနာအမည် /Sample Name	Z1SW-2 (Surface water)	နမူနာအမှတ် / Sample ID	382	
နေရာ (မြို့နယ်) Location (Township)	Mone Chaung, Downstream	လတ္တီတွဒ် Latitude	20° 19′ 57.80″ N	
နေရာ (တိုင်း/ပြည်နယ်) Location (Region/State)		လောင်ဂျီတွဒ် Longitude	94° 49′ 10.19″ E	
ပေးပို့သူအမည် /Sender Name	MPRL E&P Pte Ltd.	နမူနာကောက်ယူချိန် (နေ့၊ နာရီ) Sampling Time (Date, Time)	26.7.2020	8:30 AM
အဖွဲ့အစည်း /Organisation	MPRL E&P Pte Ltd.			
ဆက်သွယ်ရန် /Contact	09449001927	နမူနာရောက်ရှိချိန် (နေ့၊ နာရီ) Arriving Time (Date, Time)	29.7.2020	

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

Analysis Results/စမ်းသပ်ချက်အဖြေ

စဉ် Sr.	အရည်အသွေးညွှန်းကိန်း Quality Parameter	ရလဒ် အဖြေ 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)	1100	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)	176	3M Pate count method	0	
7	Total *E.coli* count (CFU/ml)	0	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 Myat Nyein Research Assistant ALARM	Htun Inzali Research Assistant ALARM	Dr. Nitar Nwe Research Scientist Ecological Laboratory ALARM

ပတ်ဝန်းကျင်ရေးရာဓာတ်ခွဲခန်း
Ecological Laboratory

စိမ်းလန်းအဓိမြေဖွံ့ဖြိုးတိုးတက်ရေးအသင်း (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 / 376

နေ့စွဲ/Date: 4th August, 2020

ဓာတ်ခွဲစစ်ဆေးမှုအစီအရင်ခံစာ/Laboratory Analysis Report

နမူနာရာဇဝင် /Sample Profile

နမူနာအမည် /Sample Name	Z2SW-1 (Surface water)	နမူနာအမှတ် / Sample ID	376	
နေရာ (မြို့.နယ်) Location (Township)	Mann Chaung, Kyauk San village	လတ္တီတွဒ် Latitude	20° 15′ 29.55″ N	
နေရာ (တိုင်း/ပြည်နယ်) Location (Region/State)		လောင်ဂျီတွဒ် Longitude	94° 50′ 1.86″ E	
ပေးပို့သူအမည် /Sender Name	MPRL E&P Pte Ltd.	နမူနာကောက်ယူချိန် (နေ့၊ နာရီ) Sampling Time (Date, Time)	25.7.2020	11:25AM
အဖွဲ့အစည်း /Organisation	MPRL E&P Pte Ltd.			
ဆက်သွယ်ရန် /Contact	09449001927	နမူနာရောက်ရှိချိန် (နေ့၊ နာရီ) Arriving Time (Date, Time)	29.7.2020	

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

(ဤဓာတ်ခွဲစစ်ဆေးမှုအစီရင်ခံစာသည် ပေးပို့သူမှပို့ဆောင်ခဲ့သည့်နမူနာကိုသာအခြေခံထားပါသည်။)

Analysis Results/စမ်းသပ်ချက်အဖြေ

စဉ် Sr.	အရည်အသွေးညွှန်းကိန်း Quality Parameter	ရလဒ် အဖြေ 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)	0	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)	123	3M Pate count method	0	
7	Total *E.coli* count (CFU/ml)	0	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 Myat Nyein Research Assistant ALARM	Htun Inzali Research Assistant ALARM	Dr. Nitar Nwe Research Scientist Ecological Laboratory ALARM

ပတ်ဝန်းကျင်ရေးရာဓာတ်ခွဲခန်း
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531-D, Marlar Myaing Yeik Thar Street, 8 Ward, Kamayut Township, Yangon. Telephone: +95 1 503301

စာအမှတ်/Reference Number: EL (M)-R / 377

နေ့စွဲ/Date: 4th August, 2020

ဓာတ်ခွဲစစ်ဆေးမှုအစီအရင်ခံစာ/Laboratory Analysis Report

နမူနာရာဇဝင် /Sample Profile

နမူနာအမည် /Sample Name	Z2SW-2 (Surface water)	နမူနာအမှတ် / Sample ID	377	
နေရာ (မြို့နယ်) Location (Township)	Mann Chaung, Downstream	လတ္တီတွဒ် Latitude	20° 15′ 33.13″ N	
နေရာ (တိုင်း/ပြည်နယ်) Location (Region/State)		လောင်ဂျီတွဒ် Longitude	94° 51′ 0.27″ E	
ပေးပို့သူအမည် /Sender Name	MPRL E&P Pte Ltd.	နမူနာကောက်ယူချိန် (နေ့၊ နာရီ) Sampling Time (Date, Time)	25.7.2020	8:30 AM
အဖွဲ့အစည်း /Organisation	MPRL E&P Pte Ltd.			
ဆက်သွယ်ရန် /Contact	09449001927	နမူနာရောက်ရှိချိန် (နေ့၊ နာရီ) Arriving Time (Date, Time)	29.7.2020	

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

(ဤဓာတ်ခွဲစစ်ဆေးမှုအစီရင်ခံစာသည် ပေးပို့သူမှပို့ဆောင်ခဲ့သည့်နမူနာကိုသာအခြေခံထားပါသည်။)

Analysis Results/စမ်းသပ်ချက်အဖြေ

စဉ် Sr.	အရည်အသွေးညွှန်းကိန်း Quality Parameter	ရလဒ် အဖြေ 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)	4	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)	220	3M Pate count method	0	
7	Total *E.coli* count (CFU/ml)	0	3M Pate count method	0	

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

စမ်းသပ်ပြီး	စစ်ဆေးပြီး	တာဝန်ခံ
Tested by	Checked by	Approved by
May Myat Nyein	Htun Inzali	Dr. Nitar Nwe
Research Assistant	Research Assistant	Research Scientist
ALARM	ALARM	Ecological Laboratory
		ALARM

ပတ်ဝန်းကျင်ရေးရာဓာတ်ခွဲခန်း
Ecological Laboratory

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531-D, Marlar Myaing Yeik Thar Street, 8 Ward, Kamayut Township, Yangon. Telephone: +95 1 503301

စာအမှတ်/Reference Number: EL (M)-R / 380

နေ့စွဲ/Date: 4th August, 2020

ဓာတ်ခွဲစစ်ဆေးမှုအစီအရင်ခံစာ/Laboratory Analysis Report

နမူနာရာဇဝင် /Sample Profile

နမူနာအမည် /Sample Name	Z3SW-1 (Surface water)	နမူနာအမှတ် / Sample ID	380	
နေရာ (မြို့နယ်) Location (Township)	Mann Chaung , near Kywegya village	လတ္တီတွဒ် Latitude	20° 14′ 46.51″ N	
နေရာ (တိုင်း/ပြည်နယ်) Location (Region/State)		လောင်ဂျီတွဒ် Longitude	94° 51′ 0.27″ E	
ပေးပို့သူအမည် /Sender Name	MPRL E&P Pte Ltd.	နမူနာကောက်ယူချိန် (နေ့၊ နာရီ) Sampling Time (Date, Time)	25.7.2020	9:05 AM
အဖွဲ့အစည်း /Organisation	MPRL E&P Pte Ltd.			
ဆက်သွယ်ရန် /Contact	09449001927	နမူနာရောက်ရှိချိန် (နေ့၊ နာရီ) Arriving Time (Date, Time)	29.7.2020	

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

(ဤဓာတ်ခွဲစစ်ဆေးမှုအစီရင်ခံစာသည် ပေးပို့သူမှပို့ဆောင်ခဲ့သည့်နမူနာကိုသာအခြေခံထားပါသည်။)

Analysis Results/စမ်းသပ်ချက်အဖြေ

စဉ် Sr.	အရည်အသွေးညွှန်းကိန်း Quality Parameter	ရလဒ် အဖြေ 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)	460	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)	140	3M Pate count method	0	
7	Total *E.coli* count (CFU/ml)	0	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 Myat Nyein Research Assistant ALARM	Htun Inzali Research Assistant ALARM	Dr. Nitar Nwe Research Scientist Ecological Laboratory ALARM

ပတ်ဝန်းကျင်ရေးရာဓာတ်ခွဲခန်း
Ecological Laboratory

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531-D, Marlar Myaing Yeik Thar Street, 8 Ward, Kamayut Township, Yangon. Telephone: +95 1 503301

စာအမှတ်/Reference Number: EL (M)-R / 379

နေ့စွဲ/Date: 4th August, 2020

ဓာတ်ခွဲစစ်ဆေးမှုအစီအရင်ခံစာ/Laboratory Analysis Report

နမူနာရာဇဝင် /Sample Profile

နမူနာအမည် /Sample Name	Z3SW-2 (Surface water)	နမူနာအမှတ် / Sample ID	379	
နေရာ (မြို့နယ်) Location (Township)	Mann Chaung , Downstream	လတ္တီတွဒ် Latitude	20° 14′ 45.74″ N	
နေရာ (တိုင်း/ပြည်နယ်) Location (Region/State)		လောင်ဂျီတွဒ် Longitude	94° 51′ 1.87″ E	
ပေးပို့သူအမည် /Sender Name	MPRL E&P Pte Ltd.	နမူနာကောက်ယူချိန် (နေ့၊ နာရီ) Sampling Time (Date, Time)	25.7.2020	8:30 AM
အဖွဲ့အစည်း /Organisation	MPRL E&P Pte Ltd.			
ဆက်သွယ်ရန် /Contact	09449001927	နမူနာရောက်ရှိချိန် (နေ့၊ နာရီ) Arriving Time (Date, Time)	29.7.2020	

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

(ဤဓာတ်ခွဲစစ်ဆေးမှုအစီရင်ခံစာသည် ပေးပို့သူမှပို့ဆောင်ခဲ့သည့်နမူနာကိုသာအခြေခံထားပါသည်။)

Analysis Results/စမ်းသပ်ချက်အဖြေ

စဉ် Sr.	အရည်အသွေးညွှန်းကိန်း Quality Parameter	ရလဒ် အဖြေ 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)	>1100	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)	170	3M Pate count method	0	
7	Total *E.coli* count (CFU/ml)	0	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 Myat Nyein	Htun Inzali	Dr. Nitar Nwe
Research Assistant	Research Assistant	Research Scientist
ALARM	ALARM	Ecological Laboratory ALARM

ပတ်ဝန်းကျင်ရေးရာဓာတ်ခွဲခန်း
Ecological Laboratory

စိမ်းလန်းအဓိမြေဖွံ့.ဖြိုးတိုးတက်ရေးအသင်း (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 / 384

နေ့စွဲ/Date: 4th August, 2020

ဓာတ်ခွဲစစ်ဆေးမှုအစီအရင်ခံစာ/Laboratory Analysis Report

နမူနာရာဇဝင် /Sample Profile

နမူနာအမည် /Sample Name	Z4SW-1 (Surface water)	နမူနာအမှတ် / Sample ID	384	
နေရာ (မြို့နယ်) Location (Township)	Near West bank of Ayeyarwady river	လတ္တီတွဒ် Latitude	20˚ 11′ 41.31″ N	
နေရာ (တိုင်း/ပြည်နယ်) Location (Region/State)	Minbu	လောင်ဂျီတွဒ် Longitude	94˚ 52′ 41.11″ E	
ပေးပို့သူအမည် /Sender Name	MPRL E&P Pte Ltd.	နမူနာကောက်ယူချိန် (နေ့၊ နာရီ) Sampling Time (Date, Time)	25.7.2020	7:00 AM
အဖွဲ့အစည်း /Organisation	MPRL E&P Pte Ltd.			
ဆက်သွယ်ရန် /Contact	09449001927	နမူနာရောက်ရှိချိန် (နေ့၊ နာရီ) Arriving Time (Date, Time)	29.7.2020	

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

Analysis Results/စမ်းသပ်ချက်အဖြေ

စဉ် Sr.	အရည်အသွေးညွှန်းကိန်း Quality Parameter	ရလဒ် အဖြေ 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)	1100	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)	2300	3M Pate count method	0	
7	Total *E.coli* count (CFU/ml)	0	3M Pate count method	0	

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

စမ်းသပ်ပြီး	စစ်ဆေးပြီး	တာဝန်ခံ
Tested by	Checked by	Approved by
May Myat Nyein	Htun Inzali	Dr. Nitar Nwe
Research Assistant	Research Assistant	Research Scientist
ALARM	ALARM	Ecological Laboratory ALARM

ပတ်ဝန်းကျင်ရေးရာဓာတ်ခွဲခန်း
Ecological Laboratory

စိမ်းလန်းအမိမြေဖွံ့ဖြိုးတိုးတက်ရေးအသင်း (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 / 381

နေ့စွဲ/Date: 4th August, 2020

ဓာတ်ခွဲစစ်ဆေးမှုအစီအရင်ခံစာ/Laboratory Analysis Report

နမူနာရာဇဝင် /Sample Profile

နမူနာအမည် /Sample Name	Z4SW-2 (Surface water)	နမူနာအမှတ် / Sample ID	381	
နေရာ (မြို့နယ်) Location (Township)	Ayeyarwady river , Downstream	လတ္တီတွဒ် Latitude	20° 11′ 38.80″ N	
နေရာ (တိုင်း/ပြည်နယ်) Location (Region/State)		လောင်ဂျီတွဒ် Longitude	94° 52′ 42.50″ E	
ပေးပို့သူအမည် /Sender Name	MPRL E&P Pte Ltd.	နမူနာကောက်ယူချိန် (နေ့၊ နာရီ) Sampling Time (Date, Time)	25.7.2020	7:00 AM
အဖွဲ့အစည်း /Organisation	MPRL E&P Pte Ltd.			
ဆက်သွယ်ရန် /Contact	09449001927	နမူနာရောက်ရှိချိန် (နေ့၊ နာရီ) Arriving Time (Date, Time)	29.7.2020	

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

Analysis Results/စမ်းသပ်ချက်အဖြေ

စဉ် Sr.	အရည်အသွေးညွှန်းကိန်း Quality Parameter	ရလဒ် အဖြေ 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)	>1100	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)	2433	3M Pate count method	0	
7	Total *E.coli* count (CFU/ml)	0	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 Myat Nyein Research Assistant ALARM	Htun Inzali Research Assistant ALARM	Dr. Nitar Nwe Research Scientist Ecological Laboratory ALARM

ပတ်ဝန်းကျင်ရေးရာဓာတ်ခွဲခန်း
Ecological Laboratory

စိမ်းလန်းအမိမြေဖွံ့ဖြိုးတိုးတက်ရေးအသင်း (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 / 383

နေ့စွဲ/Date: 4th August, 2020

ဓာတ်ခွဲစစ်ဆေးမှုအစီအရင်ခံစာ/Laboratory Analysis Report

နမူနာရာဇဝင် /Sample Profile

နမူနာအမည် /Sample Name	Z4GW-2 (Ground water)	နမူနာအမှတ် / Sample ID	383	
နေရာ (မြို့နယ်) Location (Township)	Shwe War gone ward	လတ္တီတွဒ် Latitude	20° 11′ 29.50″ N	
နေရာ (တိုင်း/ပြည်နယ်) Location (Region/State)	Minbu	လောင်ဂျီတွဒ် Longitude	94° 52′ 27.85″ E	
ပေးပို့သူအမည် /Sender Name	MPRL E&P Pte Ltd.	နမူနာကောက်ယူချိန် (နေ့၊ နာရီ) Sampling Time (Date, Time)	25.7.2020	6:31 AM
အဖွဲ့အစည်း /Organisation	MPRL E&P Pte Ltd.			
ဆက်သွယ်ရန် /Contact	09449001927	နမူနာရောက်ရှိချိန် (နေ့၊ နာရီ) Arriving Time (Date, Time)	29.7.2020	

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

(ဤဓာတ်ခွဲစစ်ဆေးမှုအစီရင်ခံစာသည် ပေးပို့သူမှပို့ဆောင်ခဲ့သည့်နမူနာကိုသာအခြေခံထားပါသည်။)

Analysis Results/စမ်းသပ်ချက်အဖြေ

စဉ် Sr.	အရည်အသွေးညွှန်းကိန်း Quality Parameter	ရလဒ် အဖြေ 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)	>1100	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)	4666	3M Pate count method	0	
7	Total *E.coli* count (CFU/ml)	0	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 Myat Nyein Research Assistant ALARM	Htun Inzali Research Assistant ALARM	Dr. Nitar Nwe Research Scientist Ecological Laboratory ALARM

ပတ်ဝန်းကျင်ရေးရာဓာတ်ခွဲခန်း
Ecological Laboratory

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531-D, Marlar Myaing Yeik Thar Street, 8 Ward, Kamayut Township, Yangon. Telephone: +95 1 503301

စာအမှတ်/Reference Number: EL (M)-R / 387

နေ့စွဲ/Date: 4th August, 2020

ဓာတ်ခွဲစစ်ဆေးမှုအစီအရင်ခံစာ/Laboratory Analysis Report

နမူနာရာဇဝင် /Sample Profile

နမူနာအမည် /Sample Name	Z1GW-1 (Ground water)	နမူနာအမှတ် / Sample ID	387	
နေရာ (မြို့နယ်) Location (Township)	Pauk Su Village	လတ္တီတွဒ် Latitude	20° 19′ 40.01″ N	
နေရာ (တိုင်း/ပြည်နယ်) Location (Region/State)	Pwint Phyu	လောင်ဂျီတွဒ် Longitude	94° 49′ 18.27″ E	
ပေးပို့သူအမည် /Sender Name	MPRL E&P Pte Ltd.	နမူနာကောက်ယူချိန် (နေ့၊ နာရီ) Sampling Time (Date, Time)	26.7.2020	9:15 AM
အဖွဲ့အစည်း /Organisation	MPRL E&P Pte Ltd.			
ဆက်သွယ်ရန် /Contact	09449001927	နမူနာရောက်ရှိချိန် (နေ့၊ နာရီ) Arriving Time (Date, Time)	29.7.2020	

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

(ဤဓာတ်ခွဲစစ်ဆေးမှုအစီရင်ခံစာသည် ပေးပို့သူမှပို့ဆောင်ခဲ့သည့်နမူနာကိုသာအခြေခံထားပါသည်။)

Analysis Results/စမ်းသပ်ချက်အဖြေ

စဉ် Sr.	အရည်အသွေးညွှန်းကိန်း Quality Parameter	ရလဒ် အဖြေ 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)	23	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)	5600	3M Pate count method	0	
7	Total *E.coli* count (CFU/ml)	40	3M Pate count method	0	

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

စမ်းသပ်ပြီး	စစ်ဆေးပြီး	တာဝန်ခံ
Tested by	Checked by	Approved by
May Myat Nyein	Htun Inzali	Dr. Nitar Nwe
Research Assistant	Research Assistant	Research Scientist
ALARM	ALARM	Ecological Laboratory ALARM

ပတ်ဝန်းကျင်ရေးရာဓာတ်ခွဲခန်း
Ecological Laboratory

စိမ်းလန်းအဓိမြေဖွံ့.ဖြိုးတိုးတက်ရေးအသင်း (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 / 388

နေ့စွဲ/Date: 4th August, 2020

ဓာတ်ခွဲစစ်ဆေးမှုအစီအရင်ခံစာ/Laboratory Analysis Report

နမူနာရာဇဝင် /Sample Profile

နမူနာအမည် /Sample Name	Z1GW-2 (Ground water)	နမူနာအမှတ် / Sample ID	388	
နေရာ (မြို့နယ်) Location (Township)	Pauk Su Village	လတ္တီတွဒ် Latitude	20° 19′ 45.22″ N	
နေရာ (တိုင်း/ပြည်နယ်) Location (Region/State)	Pwint Phyu	လောင်ဂျီတွဒ် Longitude	94° 49′ 20.51″ E	
ပေးပို့သူအမည် /Sender Name	MPRL E&P Pte Ltd.	နမူနာကောက်ယူချိန် (နေ့၊ နာရီ) Sampling Time (Date, Time)	26.7.2020	8:50 AM
အဖွဲ့အစည်း /Organisation	MPRL E&P Pte Ltd.			
ဆက်သွယ်ရန် /Contact	09449001927	နမူနာရောက်ရှိချိန် (နေ့၊ နာရီ) Arriving Time (Date, Time)	29.7.2020	

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

(ဤဓာတ်ခွဲစစ်ဆေးမှုအစီရင်ခံစာသည် ပေးပို့သူမှပို့ဆောင်ခဲ့သည့်နမူနာကိုသာအခြေခံထားပါသည်။)

Analysis Results/စမ်းသပ်ချက်အဖြေ

စဉ် Sr.	အရည်အသွေးညွှန်းကိန်း Quality Parameter	ရလဒ် အဖြေ 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)	0	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)	35100	3M Pate count method	0	
7	Total *E.coli* count (CFU/ml)	0	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 Myat Nyein Research Assistant ALARM	Htun Inzali Research Assistant ALARM	Dr. Nitar Nwe Research Scientist Ecological Laboratory ALARM

ပတ်ဝန်းကျင်ရေးရာဓာတ်ခွဲခန်း
Ecological Laboratory

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531-D, Marlar Myaing Yeik Thar Street, 8 Ward, Kamayut Township, Yangon. Telephone: +95 1 503301

စာအမှတ်/Reference Number: EL (M)-R / 386

နေ့စွဲ/Date: 4th August, 2020

ဓာတ်ခွဲစစ်ဆေးမှုအစီအရင်ခံစာ/Laboratory Analysis Report

နမူနာရာဇဝင် /Sample Profile

နမူနာအမည် /Sample Name	Z2GW-1 (Ground water)	နမူနာအမှတ် / Sample ID	386	
နေရာ (မြို့နယ်) Location (Township)	Kyauk San Village	လတ္တီတွဒ် Latitude	20° 15′ 38.43″ N	
နေရာ (တိုင်း/ပြည်နယ်) Location (Region/State)	Minbu	လောင်ဂျီတွဒ် Longitude	94° 49′ 59.29″ E	
ပေးပို့သူအမည် /Sender Name	MPRL E&P Pte Ltd.	နမူနာကောက်ယူချိန် (နေ့၊ နာရီ) Sampling Time (Date, Time)	25.7.2020	11:30 AM
အဖွဲ့အစည်း /Organisation	MPRL E&P Pte Ltd.			
ဆက်သွယ်ရန် /Contact	09449001927	နမူနာရောက်ရှိချိန် (နေ့၊ နာရီ) Arriving Time (Date, Time)	29.7.2020	

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

(ဤဓာတ်ခွဲစစ်ဆေးမှုအစီရင်ခံစာသည် ပေးပို့သူမှပို့ဆောင်ခဲ့သည့်နမူနာကိုသာအခြေခံထားပါသည်။)

Analysis Results/စမ်းသပ်ချက်အဖြေ

စဉ် Sr.	အရည်အသွေးညွှန်းကိန်း Quality Parameter	ရလဒ် အဖြေ 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)	>1100	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)	246	3M Pate count method	0	
7	Total *E.coli* count (CFU/ml)	0	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 Myat Nyein Research Assistant ALARM	Htun Inzali Research Assistant ALARM	Dr. Nitar Nwe Research Scientist Ecological Laboratory ALARM

ပတ်ဝန်းကျင်ရေးရာဓာတ်ခွဲခန်း

Ecological Laboratory

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531-D, Marlar Myaing Yeik Thar Street, 8 Ward, Kamayut Township, Yangon. Telephone: +95 1 503301

စာအမှတ်/Reference Number: EL (M)-R / 378

နေ့စွဲ/Date: 4th August, 2020

ဓာတ်ခွဲစစ်ဆေးမှုအစီအရင်ခံစာ/Laboratory Analysis Report

နမူနာရာဇဝင် /Sample Profile

နမူနာအမည် /Sample Name	Z2GW-2 (Ground water)	နမူနာအမှတ် / Sample ID	378	
နေရာ (မြို့.နယ်) Location (Township)	Kyauk San village	လတ္တီတွဒ် Latitude	20° 15′ 39.50″ N	
နေရာ (တိုင်း/ပြည်နယ်) Location (Region/State)	Minbu	လောင်ဂျီတွဒ် Longitude	94° 50′ 5.51″ E	
ပေးပို့သူအမည် /Sender Name	MPRL E&P Pte Ltd.	နမူနာကောက်ယူချိန် (နေ့၊ နာရီ) Sampling Time (Date, Time)	25.7.2020	10:15AM
အဖွဲ့အစည်း /Organisation	MPRL E&P Pte Ltd.			
ဆက်သွယ်ရန် /Contact	09449001927	နမူနာရောက်ရှိချိန် (နေ့၊ နာရီ) Arriving Time (Date, Time)	29.7.2020	

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

(ဤဓာတ်ခွဲစစ်ဆေးမှုအစီရင်ခံစာသည် ပေးပို့သူမှပို့ဆောင်ခဲ့သည့်နမူနာကိုသာအခြေခံထားပါသည်။)

Analysis Results/စမ်းသပ်ချက်အဖြေ

စဉ် Sr.	အရည်အသွေးညွှန်းကိန်း Quality Parameter	ရလဒ် အဖြေ 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)	150	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)	160	3M Pate count method	0	
7	Total *E.coli* count (CFU/ml)	0	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 Myat Nyein Research Assistant ALARM	Htun Inzali Research Assistant ALARM	Dr. Nitar Nwe Research Scientist Ecological Laboratory ALARM

ပတ်ဝန်းကျင်ရေးရာဓာတ်ခွဲခန်း
Ecological Laboratory

စိမ်းလန်းအမိမြေဖွံ့ဖြိုးတိုးတက်ရေးအသင်း (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 / 375

နေ့စွဲ/Date: 4th August, 2020

ဓာတ်ခွဲစစ်ဆေးမှုအစီအရင်ခံစာ/Laboratory Analysis Report

နမူနာရာဇဝင် /Sample Profile

နမူနာအမည် /Sample Name	Z3GW-1 (Ground water)	နမူနာအမှတ် / Sample ID	375	
နေရာ (မြို့နယ်) Location (Township)	Kywe Gya Village	လတ္တီတွဒ် Latitude	20° 15′ 5.35″ N	
နေရာ (တိုင်း/ပြည်နယ်) Location (Region/State)	Minbu	လောင်ဂျီတွဒ် Longitude	94° 50′ 54.52″ E	
ပေးပို့သူအမည် /Sender Name	MPRL E&P Pte Ltd.	နမူနာကောက်ယူချိန် (နေ့၊ နာရီ) Sampling Time (Date, Time)	25.7.2020	8:50 AM
အဖွဲ့အစည်း /Organisation	MPRL E&P Pte Ltd.			
ဆက်သွယ်ရန် /Contact	09449001927	နမူနာရောက်ရှိချိန် (နေ့၊ နာရီ) Arriving Time (Date, Time)	29.7.2020	

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

(ဤဓာတ်ခွဲစစ်ဆေးမှုအစီရင်ခံစာသည် ပေးပို့သူမှပို့ဆောင်ခဲ့သည့်နမူနာကိုသာအခြေခံထားပါသည်။)

Analysis Results/စမ်းသပ်ချက်အဖြေ

စဉ် Sr.	အရည်အသွေးညွှန်းကိန်း Quality Parameter	ရလဒ် အဖြေ 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)	>1100	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)	5466	3M Pate count method	0	
7	Total *E.coli* count (CFU/ml)	0	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 Myat Nyein Research Assistant ALARM	Htun Inzali Research Assistant ALARM	Dr. Nitar Nwe Research Scientist Ecological Laboratory ALARM

ပတ်ဝန်းကျင်ရေးရာဓာတ်ခွဲခန်း
Ecological Laboratory

စိမ်းလန်းအဓိမြေဖွံ့ဖြိုးတိုးတက်ရေးအသင်း (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 / 385

နေ့စွဲ/Date: 4th August, 2020

ဓာတ်ခွဲစစ်ဆေးမှုအစီအရင်ခံစာ/Laboratory Analysis Report

နမူနာရာဇဝင် /Sample Profile

နမူနာအမည် /Sample Name	Z3GW-2 (Ground water)	နမူနာအမှတ် / Sample ID	385	
နေရာ (မြို့နယ်) Location (Township)	Kywe Gya Village	လတ္တီတွဒ် Latitude	20° 11′ 37.92″ N	
နေရာ (တိုင်း/ပြည်နယ်) Location (Region/State)	Minbu	လောင်ဂျီတွဒ် Longitude	94° 52′ 29.67″ E	
ပေးပို့သူအမည် /Sender Name	MPRL E&P Pte Ltd.	နမူနာကောက်ယူချိန် (နေ့၊ နာရီ) Sampling Time (Date, Time)	25.7.2020	8:05 AM
အဖွဲ့အစည်း /Organisation	MPRL E&P Pte Ltd.			
ဆက်သွယ်ရန် /Contact	09449001927	နမူနာရောက်ရှိချိန် (နေ့၊ နာရီ) Arriving Time (Date, Time)	29.7.2020	

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

Analysis Results/စမ်းသပ်ချက်အဖြေ

စဉ် Sr.	အရည်အသွေးညွှန်းကိန်း Quality Parameter	ရလဒ် အဖြေ 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)	93	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)	12	3M Pate count method	0	
7	Total *E.coli* count (CFU/ml)	0	3M Pate count method	0	

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

စမ်းသပ်ပြီး	စစ်ဆေးပြီး	တာဝန်ခံ
Tested by	Checked by	Approved by
May Myat Nyein	Htun Inzali	Dr. Nitar Nwe
Research Assistant	Research Assistant	Research Scientist
ALARM	ALARM	Ecological Laboratory
		ALARM

ALARM Ecological Laboratory

Soil Testing Result Report

Report Number : EL-WR-20-00884 **Date : 11-08-20**

Client Information

Client Name : **MPRL E&P Pte Ltd**
Organization : **MPRL E&P Pte Ltd**
Client ID : **LC-12-001**
Registration Date & Time : **29-07-20**
Contact : **9449001927**
Testing Purpose : **Monitoring**

Sample Information

Sample ID : **SS-20-00043**
Sample Name : **Z1S1**
Sample Type / Source : **Soil**
Sampling Date & Time : **23-07-20** 1:30 PM
Sample Location : **Pauk Su Village, Pwint Phyu**
Latitude : **20° 19' 45.30" N**
Longitude : **94° 49' 13.99" E**

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	Compose Standards	Remarks
1	pH	7.3	S.U	-	
2	Lead	<5	mg/kg	≤300 (d)	
3	Cadmium	<0.5	mg/kg	≤ 39 (d)	
4	Copper	5	mg/kg	≤ 1500 (d)	

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

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

531-D, Marlar Myaing Yeik Thar Street, 8 Ward, Kamayut Tsp, Yangon. Tel: 01-503301, 01-503302, 09 407496078
Email: aelab@alarmmyanmar.org, alarm.myanmar@gmail.com, Website: www.alarmmyanmar.org

ALARM Ecological Laboratory

Soil Testing Result Report

Report Number : EL-WR-20-00885 **Date : 11-08-20**

Client Information

Client Name : **MPRL E&P Pte Ltd**
Organization : **MPRL E&P Pte Ltd**
Client ID : **LC-12-001**
Registration Date & Time : **29-07-20**
Contact : **9449001927**
Testing Purpose : **Monitoring**

Sample Information

Sample ID : **SS-20-00044**
Sample Name : **Z1S2**
Sample Type / Source : **Soil**
Sampling Date & Time : **23-07-20** 1:50 PM
Sample Location : **Pauk Su Village, Pwint Phyu**
Latitude : **20° 19' 45.38" N**
Longitude : **94° 49' 21.05" E**

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	Compose Standards	Remarks
1	pH	7.6	S.U	-	
2	Lead	<5	mg/kg	≤300 (d)	
3	Cadmium	<0.5	mg/kg	≤ 39 (d)	
4	Copper	5	mg/kg	≤ 1500 (d)	

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

Tested by	Checked by	Approved by
Daw Ma Ayat 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)

531-D, Marlar Myaing Yeik Thar Street, 8 Ward, Kamayut Tsp, Yangon. Tel: 01-503301, 01-503302, 09 407496078
Email: aelab@alarmmyanmar.org, alarm.myanmar@gmail.com, Website: www.alarmmyanmar.org

ALARM Ecological Laboratory

Soil Testing Result Report

Report Number : EL-WR-20-00886 **Date : 11-08-20**

Client Information

Client Name : **MPRL E&P Pte Ltd**
Organization : **MPRL E&P Pte Ltd**
Client ID : **LC-12-001**
Registration Date & Time : **29-07-20**
Contact : **9449001927**
Testing Purpose : **Monitoring**

Sample Information

Sample ID : SS-20-00045
Sample Name : **Z2S1**
Sample Type / Source : **Soil**
Sampling Date & Time : **24-07-20** 4:30 PM
Sample Location : **Kyauk San Village, Minbu**
Latitude : **20° 15' 41.70" N**
Longitude : **94° 50' 8.41" E**

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	Compose Standards	Remarks
1	pH	7.9	S.U	-	
2	Lead	5	mg/kg	≤300 (d)	
3	Cadmium	<0.5	mg/kg	≤ 39 (d)	
4	Copper	1.5	mg/kg	≤ 1500 (d)	

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

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

531-D, Marlar Myaing Yeik Thar Street, 8 Ward, Kamayut Tsp, Yangon. Tel: 01-503301, 01-503302, 09 407496078
Email: aelab@alarmmyanmar.org, alarm.myanmar@gmail.com, Website: www.alarmmyanmar.org

ALARM Ecological Laboratory

Soil Testing Result Report

Report Number : EL-WR-20-00887 **Date : 11-08-20**

Client Information

Client Name : **MPRL E&P Pte Ltd**
Organization : **MPRL E&P Pte Ltd**
Client ID : **LC-12-001**
Registration Date & Time : **29-07-20**
Contact : **9449001927**
Testing Purpose : **Monitoring**

Sample Information

Sample ID : **SS-20-00046**
Sample Name : **Z2S2**
Sample Type / Source : **Soil**
Sampling Date & Time : **24-07-20** 4:20 PM
Sample Location : **Kyauk San Village, Minbu**
Latitude : **20° 13' 22.04" N**
Longitude : **94° 50' 10.40" E**

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	Compose Standards	Remarks
1	pH	7.6	S.U	-	
2	Lead	<5	mg/kg	≤300 (d)	
3	Cadmium	<0.5	mg/kg	≤ 39 (d)	
4	Copper	1	mg/kg	≤ 1500 (d)	

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

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

531-D, Marlar Myaing Yeik Thar Street, 8 Ward, Kamayut Tsp, Yangon. Tel: 01-503301, 01-503302, 09 407496078
Email: aelab@alarmmyanmar.org, alarm.myanmar@gmail.com, Website: www.alarmmyanmar.org

ALARM Ecological Laboratory

Soil Testing Result Report

Report Number : EL-WR-20-00888 **Date : 11-08-20**

Client Information

Client Name : **MPRL E&P Pte Ltd**
Organization : **MPRL E&P Pte Ltd**
Client ID : **LC-12-001**
Registration Date & Time : **29-07-20**
Contact : **9449001927**
Testing Purpose : **Monitoring**

Sample Information

Sample ID : SS-20-00047
Sample Name : **Z3S1**
Sample Type / Source : **Soil**
Sampling Date & Time : **22-07-20** 10:35 AM
Sample Location : **Compound of MPRL E&P Office, Minbu**
Latitude : **20° 13' 22.04" N**
Longitude : **94° 51' 19.59" E**

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	Compose Standards	Remarks
1	pH	**7.2**	**S.U**	-	
2	Lead	**<5**	**mg/kg**	≤300 (d)	
3	Cadmium	**<0.5**	**mg/kg**	≤ 39 (d)	
4	Copper	**4.5**	**mg/kg**	≤ 1500 (d)	

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

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

531-D, Marlar Myaing Yeik Thar Street, 8 Ward, Kamayut Tsp, Yangon. Tel: 01-503301, 01-503302, 09 407496078
Email: aelab@alarmmyanmar.org, alarm.myanmar@gmail.com, Website: www.alarmmyanmar.org

ALARM Ecological Laboratory

Soil Testing Result Report

Report Number : EL-WR-20-00889 **Date : 11-08-20**

Client Information

Client Name : **MPRL E&P Pte Ltd**
Organization : **MPRL E&P Pte Ltd**
Client ID : **LC-12-001**
Registration Date & Time : **29-07-20**
Contact : **9449001927**
Testing Purpose : **Monitoring**

Sample Information

Sample ID : SS-20-00048
Sample Name : **Z3S2**
Sample Type / Source : **Soil**
Sampling Date & Time : **22-07-20** 10:35 AM
Sample Location : **Compound of MPRL E&P Office, Minbu**
Latitude : **20° 13' 2.60" N**
Longitude : **94° 51' 14.86" E**

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	Compose Standards	Remarks
1	pH	7.1	S.U	-	
2	Lead	<5	mg/kg	≤300 (d)	
3	Cadmium	<0.5	mg/kg	≤ 39 (d)	
4	Copper	5	mg/kg	≤ 1500 (d)	

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

Tested by	Checked by	Approved by
Daw Khaing 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)

531-D, Marlar Myaing Yeik Thar Street, 8 Ward, Kamayut Tsp, Yangon. Tel: 01-503301, 01-503302, 09 407496078
Email: aelab@alarmmyanmar.org, alarm.myanmar@gmail.com, Website: www.alarmmyanmar.org

ALARM Ecological Laboratory

Soil Testing Result Report

Report Number : EL-WR-20-00890 **Date : 11-08-20**

Client Information

Client Name : **MPRL E&P Pte Ltd**
Organization : **MPRL E&P Pte Ltd**
Client ID : **LC-12-001**
Registration Date & Time : **29-07-20**
Contact : **9449001927**
Testing Purpose : **Monitoring**

Sample Information

Sample ID : **SS-20-00049**
Sample Name : **Z4S1**
Sample Type / Source : **Soil**
Sampling Date & Time : **22-07-20** 12:45 PM
Sample Location : **Near Western Bank of Ayeyarwady River, Minbu**
Latitude : **20° 11' 41.31" N**
Longitude : **94° 52' 39.20" E**

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	Compose Standards	Remarks
1	pH	6.6	S.U	-	
2	Lead	5	mg/kg	≤300 (d)	
3	Cadmium	<0.5	mg/kg	≤ 39 (d)	
4	Copper	5	mg/kg	≤ 1500 (d)	

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

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

531-D, Marlar Myaing Yeik Thar Street, 8 Ward, Kamayut Tsp, Yangon. Tel: 01-503301, 01-503302, 09 407496078
Email: aelab@alarmmyanmar.org, alarm.myanmar@gmail.com, Website: www.alarmmyanmar.org

ALARM Ecological Laboratory

Soil Testing Result Report

Report Number : EL-WR-20-00891 **Date : 11-08-20**

Client Information

Client Name : **MPRL E&P Pte Ltd**
Organization : **MPRL E&P Pte Ltd**
Client ID : **LC-12-001**
Registration Date & Time : **29-07-20**
Contact : **9449001927**
Testing Purpose : **Monitoring**

Sample Information

Sample ID : SS-20-00050
Sample Name : **Z4S2**
Sample Type / Source : **Soil**
Sampling Date & Time : **22-07-20** 12:20 PM
Sample Location : **Near Western Bank of Ayeyarwady River, Minbu**
Latitude : **20° 11' 45.77" N**
Longitude : **94° 52' 38.30" E**

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	Compose Standards	Remarks
1	pH	**7.2**	**S.U**	-	
2	Lead	**5**	**mg/kg**	≤300 (d)	
3	Cadmium	**<0.5**	**mg/kg**	≤ 39 (d)	
4	Copper	**10**	**mg/kg**	≤ 1500 (d)	

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

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

531-D, Marlar Myaing Yeik Thar Street, 8 Ward, Kamayut Tsp, Yangon. Tel: 01-503301, 01-503302, 09 407496078
Email: aelab@alarmmyanmar.org, alarm.myanmar@gmail.com, Website: www.alarmmyanmar.org

Analysis Report

THE GOVERNMENT OF THE REPUBLIC OF THE UNION OF MYANMAR
MINISTRY OF EDUCATION
DEPARTMENT OF RESEARCH AND INNOVATION
ANALYSIS DEPARTMENT
No.(6) KABA AYE PAGODA ROAD, YANGON

Reference: MPRL E&P Pte Ltd

Sample: ဇမြ

RESULT

Sample No.		2966/19-20
Job No.		J-2966
Sample Marked.		Soil (1) Z_1 S_1
Iron as Fe	(%)	6.87
Manganese as Mn	(%)	0.07
Zinc as Zn	(mg/kg)	85.84
Arsenic as As	(mg/kg)	<0.005

Not a Certificate of Conformance
စံချိန်စံညွှန်းကိုက်ညီကြောင်းထောက်ခံချက်မဟုတ်ပါ

Remark: *Results valid for the received sample only.*

Method/ Equipment used: Arthur I Vogel, Indian Standard, F.A.A.S

Tested by: Daw Khin Thida Myo

Daw Htike Htike Oo

Checked by: Dr. Khin Aye Tue

Technical Director: U Win Khaing Moe

Our Reference: 1048

Date: 14.8.2020

Analysis Report

THE GOVERNMENT OF THE REPUBLIC OF THE UNION OF MYANMAR
MINISTRY OF EDUCATION
DEPARTMENT OF RESEARCH AND INNOVATION
ANALYSIS DEPARTMENT
No.(6) KABA AYE PAGODA ROAD, YANGON

Reference: MPRL E&P Pte Ltd

Sample: ဓမြ

RESULT

Sample No.		2967/19-20
Job No.		J-2967
Sample Marked.		Soil (2) Z_1 S_2
Iron as Fe	(%)	6.87
Manganese as Mn	(%)	0.07
Zinc as Zn	(mg/kg)	101.70
Arsenic as As	(mg/kg)	<0.005

Not a Certificate of Conformance
စံချိန်စံညွှန်းကိုက်ညီကြောင်းထောက်ခံချက်မဟုတ်ပါ

Remark: *Results valid for the received sample only.*

Method/ Equipment used: Arthur I Vogel, Indian Standard, F.A.A.S

Tested by: Daw Khin Thida Myo

Daw Htike Htike Oo

Checked by: Dr. Khin Aye Tue

Technical Director: U Win Khaing Moe

Our Reference: 1048

Date: 14.8.2020

Analysis Report

THE GOVERNMENT OF THE REPUBLIC OF THE UNION OF MYANMAR
MINISTRY OF EDUCATION
DEPARTMENT OF RESEARCH AND INNOVATION
ANALYSIS DEPARTMENT
No.(6) KABA AYE PAGODA ROAD, YANGON

Reference: MPRL E&P Pte Ltd

Sample: ဇမြ

RESULT

Sample No.		2968/19-20
Job No.		J-2968
Sample Marked.		Soil (3) Z_2 S_1
Iron as Fe	(%)	6.89
Manganese as Mn	(%)	0.06
Zinc as Zn	(mg/kg)	72.65
Arsenic as As	(mg/kg)	<0.005

Not a Certificate of Conformance
စံချိန်စံညွှန်းကိုက်ညီကြောင်းထောက်ခံချက်မဟုတ်ပါ

Remark: *Results valid for the received sample only.*

Method/ Equipment used: Arthur I Vogel, Indian Standard, F.A.A.S

Tested by: Daw Khin Thida Myo

Daw Htike Htike Oo

Checked by: Dr. Khin Aye Tue

Technical Director: U Win Khaing Moe

Our Reference: 1048

Date: 14.8.2020

Analysis Report

THE GOVERNMENT OF THE REPUBLIC OF THE UNION OF MYANMAR
MINISTRY OF EDUCATION
DEPARTMENT OF RESEARCH AND INNOVATION
ANALYSIS DEPARTMENT
No.(6) KABA AYE PAGODA ROAD, YANGON

Reference: MPRL E&P Pte Ltd

Sample: ဇမြ

RESULT

Sample No.		2969/19-20
Job No.		J-2969
Sample Marked.		Soil (4) Z_2 S_2
Iron as Fe	(%)	6.98
Manganese as Mn	(%)	0.06
Zinc as Zn	(mg/kg)	73.67
Arsenic as As	(mg/kg)	<0.005

Not a Certificate of Conformance
စံချိန်စံညွှန်းကိုက်ညီကြောင်းထောက်ခံချက်မဟုတ်ပါ

Remark: *Results valid for the received sample only.*

Method/ Equipment used: Arthur I Vogel, Indian Standard, F.A.A.S

Tested by: Daw Khin Thida Myo

Daw Htike Htike Oo

Checked by: Dr. Khin Aye Tue

Technical Director: U Win Khaing Moe

Our Reference: 1048

Date: 14.8.2020

Analysis Report

THE GOVERNMENT OF THE REPUBLIC OF THE UNION OF MYANMAR
MINISTRY OF EDUCATION
DEPARTMENT OF RESEARCH AND INNOVATION
ANALYSIS DEPARTMENT
No.(6) KABA AYE PAGODA ROAD, YANGON

Reference: MPRL E&P Pte Ltd

Sample: ငမြ

RESULT

Sample No.		2970/19-20
Job No.		J-2970
Sample Marked.		Soil (5) Z_3 S_1
Iron as Fe	(%)	3.96
Manganese as Mn	(%)	0.05
Zinc as Zn	(mg/kg)	34.69
Arsenic as As	(mg/kg)	0.02

Not a Certificate of Conformance
စံချိန်စံညွှန်းကိုက်ညီကြောင်းထောက်ခံချက်မဟုတ်ပါ

Remark: *Results valid for the received sample only.*

Method/ Equipment used: Arthur I Vogel, Indian Standard, F.A.A.S

Tested by: Daw Khin Thida Myo

Daw Htike Htike Oo

Checked by: Dr. Khin Aye Tue

Technical Director: U Win Khaing Moe

Our Reference: 1048

Date: 14.8.2020

Analysis Report

THE GOVERNMENT OF THE REPUBLIC OF THE UNION OF MYANMAR
MINISTRY OF EDUCATION
DEPARTMENT OF RESEARCH AND INNOVATION
ANALYSIS DEPARTMENT
No.(6) KABA AYE PAGODA ROAD, YANGON

Reference: MPRL E&P Pte Ltd

Sample: ငွေ

RESULT

Sample No.		2971/19-20
Job No.		J-2971
Sample Marked.		Soil (6) Z_3 S_2
Iron as Fe	(%)	3.96
Manganese as Mn	(%)	0.04
Zinc as Zn	(mg/kg)	22.00
Arsenic as As	(mg/kg)	0.03

Not a Certificate of Conformance
စံချိန်စံညွှန်းကိုက်ညီကြောင်းထောက်ခံချက်မဟုတ်ပါ

Remark: *Results valid for the received sample only.*

Method/ Equipment used: Arthur I Vogel, Indian Standard, F.A.A.S

Tested by: Daw Khin Thida Myo

Daw Htike Htike Oo

Checked by: Dr. Khin Aye Tue

Technical Director: U Win Khaing Moe

Our Reference: 1048

Date: 14.8.2020

Analysis Report

THE GOVERNMENT OF THE REPUBLIC OF THE UNION OF MYANMAR
MINISTRY OF EDUCATION
DEPARTMENT OF RESEARCH AND INNOVATION
ANALYSIS DEPARTMENT
No.(6) KABA AYE PAGODA ROAD, YANGON

Reference: MPRL E&P Pte Ltd

Sample: ငမြ

RESULT

Sample No.		2972/19-20
Job No.		J-2972
Sample Marked.		Soil (7) $Z_4 S_1$
Iron as Fe	(%)	7.99
Manganese as Mn	(%)	0.06
Zinc as Zn	(mg/kg)	61.31
Arsenic as As	(mg/kg)	<0.005

Not a Certificate of Conformance
စံချိန်စံညွှန်းကိုက်ညီကြောင်းထောက်ခံချက်မဟုတ်ပါ

Remark: *Results valid for the received sample only.*

Method/ Equipment used: Arthur I Vogel, Indian Standard, F.A.A.S

Tested by: Daw Khin Thida Myo

Daw Htike Htike Oo

Checked by: Dr. Khin Aye Tue

Technical Director: U Win Khaing Moe

Our Reference: 1048

Date: 14.8.2020

Analysis Report

THE GOVERNMENT OF THE REPUBLIC OF THE UNION OF MYANMAR
MINISTRY OF EDUCATION
DEPARTMENT OF RESEARCH AND INNOVATION
ANALYSIS DEPARTMENT
No.(6) KABA AYE PAGODA ROAD, YANGON

Reference: MPRL E&P Pte Ltd

Sample: ငမြ

RESULT

Sample No.		2973/19-20
Job No.		J-2973
Sample Marked.		Soil (8) Z_4 S_2
Iron as Fe	(%)	7.89
Manganese as Mn	(%)	0.06
Zinc as Zn	(mg/kg)	66.30
Arsenic as As	(mg/kg)	<0.005

Not a Certificate of Conformance
စံချိန်စံညွှန်းကိုက်ညီကြောင်းထောက်ခံချက်မဟုတ်ပါ

Remark: *Results valid for the received sample only.*

Method/ Equipment used: Arthur I Vogel, Indian Standard, F.A.A.S

Tested by: Daw Khin Thida Myo

Daw Htike Htike Oo

Checked by: Dr. Khin Aye Tue

Technical Director: U Win Khaing Moe

Our Reference: 1048

Date: 14.8.2020

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Report No. : GEM-LAB-202008089
Revision No. : 1
Report Date : 14 August, 2020
Application No. : 0001-C001

Analysis Report

Client Name : MPRL E & P Pte Ltd.
Address : 623, Pyay Road , Vantage Tower, Kamayut.
Project Name : Mann Field Project
Sample Description
Sample Name : Z1 SW-1
Sample No. : W-2007179
Waste Profile No. : -
Sampling Date : 26 July, 2020
Sampling By : Customer
Sample Received Date : 28 July, 2020

No.	Parameter	Method	Unit	Result	LOQ
1	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	1.0	0.5
2	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
3	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.010	0.010
4	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.018	0.002

Remark : LOQ - Limit of Quantitation
APHA - American Public Health Association (APHA), the American Water Works Association (AWWA), and the Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 22nd edition

Analysed By :

Ni Ni Aye Lwin
Assistant Manager

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Approved By :

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Managing Director

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Report No. : GEM-LAB-202008090
Revision No. : 1
Report Date : 14 August, 2020
Application No. : 0001-C001

Analysis Report

Client Name : MPRL E & P Pte Ltd.
Address : 623, Pyay Road , Vantage Tower, Kamayut.
Project Name : Mann Field Project
Sample Description
Sample Name : Z1 SW-2
Sample No. : W-2007180
Waste Profile No. : -
Sampling Date : 26 July, 2020
Sampling By : Customer
Sample Received Date : 28 July, 2020

No.	Parameter	Method	Unit	Result	LOQ
1	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	< 0.5	0.5
2	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
3	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.010	0.010
4	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002

Remark : LOQ - Limit of Quantitation
APHA - American Public Health Association (APHA), the American Water Works Association (AWWA), and the Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 22nd edition

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Report No. : GEM-LAB-202008091
Revision No. : 1
Report Date : 14 August, 2020
Application No. : 0001-C001

Analysis Report

Client Name : MPRL E & P Pte Ltd.
Address : 623, Pyay Road , Vantage Tower, Kamayut.
Project Name : Mann Field Project
Sample Description
Sample Name : Z1 GW-1
Sample No. : W-2007181
Waste Profile No. : -
Sampling Date : 26 July, 2020
Sampling By : Customer
Sample Received Date : 28 July, 2020

No.	Parameter	Method	Unit	Result	LOQ
1	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	1.5	0.5
2	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
3	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.010	0.010
4	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.052	0.002

Remark : LOQ - Limit of Quantitation
APHA - American Public Health Association (APHA), the American Water Works Association (AWWA), and the Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 22nd edition

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Report No. : GEM-LAB-202008092
Revision No. : 1
Report Date : 14 August, 2020
Application No. : 0001-C001

Analysis Report

Client Name : MPRL E & P Pte Ltd.
Address : 623, Pyay Road , Vantage Tower, Kamayut.
Project Name : Mann Field Project
Sample Description
Sample Name : Z1 GW-2
Sample No. : W-2007182
Waste Profile No. : -

Sampling Date : 26 July, 2020
Sampling By : Customer
Sample Received Date : 28 July, 2020

No.	Parameter	Method	Unit	Result	LOQ
1	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	2.5	0.5
2	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
3	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.010	0.010
4	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.054	0.002

Remark : LOQ - Limit of Quantitation
APHA - American Public Health Association (APHA), the American Water Works Association (AWWA), and the Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 22nd edition

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Report No. : GEM-LAB-202008093
Revision No. : 1
Report Date : 14 August, 2020
Application No. : 0001-C001

Analysis Report

Client Name : MPRL E & P Pte Ltd.
Address : 623, Pyay Road , Vantage Tower, Kamayut.
Project Name : Mann Field Project
Sample Description
Sample Name : Z2 SW-1
Sample No. : W-2007183
Waste Profile No. : -
Sampling Date : 25 July, 2020
Sampling By : Customer
Sample Received Date : 28 July, 2020

No.	Parameter	Method	Unit	Result	LOQ
1	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	< 0.5	0.5
2	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
3	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.010	0.010
4	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.004	0.002

Remark : LOQ - Limit of Quantitation
APHA - American Public Health Association (APHA), the American Water Works Association (AWWA), and the Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 22nd edition

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Report No. : GEM-LAB-202008094
Revision No. : 1
Report Date : 14 August, 2020
Application No. : 0001-C001

Analysis Report

Client Name : MPRL E & P Pte Ltd.
Address : 623, Pyay Road , Vantage Tower, Kamayut.
Project Name : Mann Field Project
Sample Description
Sample Name : Z2 SW-2
Sample No. : W-2007184
Waste Profile No. : -
Sampling Date : 25 July, 2020
Sampling By : Customer
Sample Received Date : 28 July, 2020

No.	Parameter	Method	Unit	Result	LOQ
1	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	< 0.5	0.5
2	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
3	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.010	0.010
4	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.010	0.002

Remark : LOQ - Limit of Quantitation
APHA - American Public Health Association (APHA), the American Water Works Association (AWWA), and the Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 22nd edition

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Report No. : GEM-LAB-202008095
Revision No. : 1
Report Date : 14 August, 2020
Application No. : 0001-C001

Analysis Report

Client Name : MPRL E & P Pte Ltd.
Address : 623, Pyay Road , Vantage Tower, Kamayut.
Project Name : Mann Field Project
Sample Description
Sample Name : Z2 GW-1
Sample No. : W-2007185
Waste Profile No. : -
Sampling Date : 25 July, 2020
Sampling By : Customer
Sample Received Date : 28 July, 2020

No.	Parameter	Method	Unit	Result	LOQ
1	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	1.3	0.5
2	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
3	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.010	0.010
4	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002

Remark : LOQ - Limit of Quantitation
APHA - American Public Health Association (APHA), the American Water Works Association (AWWA), and the Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 22nd edition

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Report No. : GEM-LAB-202008096
Revision No. : 1
Report Date : 14 August, 2020
Application No. : 0001-C001

Analysis Report

Client Name : MPRL E & P Pte Ltd.
Address : 623, Pyay Road , Vantage Tower, Kamayut.
Project Name : Mann Field Project
Sample Description
Sample Name : Z2 GW-2
Sample No. : W-2007186
Waste Profile No. : -
Sampling Date : 25 July, 2020
Sampling By : Customer
Sample Received Date : 28 July, 2020

No.	Parameter	Method	Unit	Result	LOQ
1	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	< 0.5	0.5
2	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
3	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.010	0.010
4	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002

Remark : LOQ - Limit of Quantitation
APHA - American Public Health Association (APHA), the American Water Works Association (AWWA), and the Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 22nd edition

Analysed By :

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Report No. : GEM-LAB-202008097
Revision No. : 1
Report Date : 14 August, 2020
Application No. : 0001-C001

Analysis Report

Client Name : MPRL E & P Pte Ltd.
Address : 623, Pyay Road , Vantage Tower, Kamayut.
Project Name : Mann Field Project
Sample Description
Sample Name : Z3 SW-1
Sample No. : W-2007187
Waste Profile No. : -
Sampling Date : 25 July, 2020
Sampling By : Customer
Sample Received Date : 28 July, 2020

No.	Parameter	Method	Unit	Result	LOQ
1	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	1.5	0.5
2	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
3	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.010	0.010
4	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.014	0.002

Remark : LOQ - Limit of Quantitation
APHA - American Public Health Association (APHA), the American Water Works Association (AWWA), and the Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 22nd edition

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Report No. : GEM-LAB-202008098
Revision No. : 1
Report Date : 14 August, 2020
Application No. : 0001-C001

Analysis Report

Client Name : MPRL E & P Pte Ltd.
Address : 623, Pyay Road , Vantage Tower, Kamayut.
Project Name : Mann Field Project
Sample Description
Sample Name : Z3 SW-2
Sample No. : W-2007188
Waste Profile No. : -
Sampling Date : 25 July, 2020
Sampling By : Customer
Sample Received Date : 28 July, 2020

No.	Parameter	Method	Unit	Result	LOQ
1	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	1.2	0.5
2	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
3	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.010	0.010
4	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.008	0.002

Remark : LOQ - Limit of Quantitation
APHA - American Public Health Association (APHA), the American Water Works Association (AWWA), and the Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 22nd edition

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Report No. : GEM-LAB-202008099
Revision No. : 1
Report Date : 14 August, 2020
Application No. : 0001-C001

Analysis Report

Client Name : MPRL E & P Pte Ltd.
Address : 623, Pyay Road , Vantage Tower, Kamayut.
Project Name : Mann Field Project
Sample Description
Sample Name : Z3 GW-1
Sample No. : W-2007189
Waste Profile No. : -

Sampling Date : 25 July, 2020
Sampling By : Customer
Sample Received Date : 28 July, 2020

No.	Parameter	Method	Unit	Result	LOQ
1	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	< 0.5	0.5
2	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
3	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.010	0.010
4	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.032	0.002

Remark : LOQ - Limit of Quantitation
APHA - American Public Health Association (APHA), the American Water Works Association (AWWA), and the Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 22nd edition

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Report No. : GEM-LAB-202008100
Revision No. : 1
Report Date : 14 August, 2020
Application No. : 0001-C001

Analysis Report

Client Name : MPRL E & P Pte Ltd.
Address : 623, Pyay Road , Vantage Tower, Kamayut.
Project Name : Mann Field Project
Sample Description
Sample Name : Z3 GW-2
Sample No. : W-2007190
Waste Profile No. : -
Sampling Date : 25 July, 2020
Sampling By : Customer
Sample Received Date : 28 July, 2020

No.	Parameter	Method	Unit	Result	LOQ
1	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	< 0.5	0.5
2	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
3	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.010	0.010
4	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.016	0.002

Remark : LOQ - Limit of Quantitation
APHA - American Public Health Association (APHA), the American Water Works Association (AWWA), and the Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 22nd edition

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Report No. : GEM-LAB-202008101
Revision No. : 1
Report Date : 14 August, 2020
Application No. : 0001-C001

Analysis Report

Client Name : MPRL E & P Pte Ltd.
Address : 623, Pyay Road , Vantage Tower, Kamayut.
Project Name : Mann Field Project
Sample Description
Sample Name : Z4 SW-1
Sample No. : W-2007191
Waste Profile No. : -
Sampling Date : 25 July, 2020
Sampling By : Customer
Sample Received Date : 28 July, 2020

No.	Parameter	Method	Unit	Result	LOQ
1	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	1.3	0.5
2	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
3	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.010	0.010
4	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.018	0.002

Remark : LOQ - Limit of Quantitation
APHA - American Public Health Association (APHA), the American Water Works Association (AWWA), and the Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 22nd edition

Analysed By :

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Report No. : GEM-LAB-202008102
Revision No. : 1
Report Date : 14 August, 2020
Application No. : 0001-C001

Analysis Report

Client Name : MPRL E & P Pte Ltd.
Address : 623, Pyay Road , Vantage Tower, Kamayut.
Project Name : Mann Field Project
Sample Description
Sample Name : Z4 SW-2
Sample No. : W-2007192
Waste Profile No. : -

Sampling Date : 25 July, 2020
Sampling By : Customer
Sample Received Date : 28 July, 2020

No.	Parameter	Method	Unit	Result	LOQ
1	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	0.9	0.5
2	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
3	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.010	0.010
4	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.028	0.002

Remark : LOQ - Limit of Quantitation
APHA - American Public Health Association (APHA), the American Water Works Association (AWWA), and the Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 22nd edition

Analysed By :

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Managing Director
Aug 14, 2020

GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD.
Lot No E1. Thilawa SEZ Zone A, Yangon Region, Myanmar.
Phone No Fax No: (+95) 1 2309051

Report No. : GEM-LAB-202008103
Revision No. : 1
Report Date : 14 August, 2020
Application No. : 0001-C001

Analysis Report

Client Name : MPRL E & P Pte Ltd.
Address : 623, Pyay Road , Vantage Tower, Kamayut.
Project Name : Mann Field Project
Sample Description
Sample Name : Z4 GW-2
Sample No. : W-2007193
Waste Profile No. : -

Sampling Date : 25 July, 2020
Sampling By : Customer
Sample Received Date : 28 July, 2020

No.	Parameter	Method	Unit	Result	LOQ
1	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	4.1	0.5
2	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
3	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.010	0.010
4	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.020	0.002

Remark : LOQ - Limit of Quantitation
APHA - American Public Health Association (APHA), the American Water Works Association (AWWA), and the Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 22nd edition

Analysed By :

Ni Ni Aye Lwin
Assistant Manager

LAB
Aug 14, 2020
GEM

Approved By :

Hideki Yomo Aug 14, 2020
Managing Director

DOWA

GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD.
Lot No E1. Thilawa SEZ Zone A, Yangon Region, Myanmar.
Phone No Fax No: (+95) 1 2309051

motivate our planet
Doc No: GEM-LB-R003E/00

< Analysis Application Form >

Date: 28/7/20

Client's information (to be described in the tax invoice)	Client's information to be described in the analysis report (if it should be specified)
Client name: MPRL E&P Pte Ltd.	Client name:
Address of client: 623, Pyay Road, Vantage Tower	Address of client:
Project name: - Mann Field Project	Project name: -
Tel No. / Email: 09449001927	Tel No. / Email:
Contact person/Position: Ma. Tin Nwe Win	Contact person/Position:

Sample information *To be filled by GEM Lab		
	Sampling date:	Sample bottle(s): ☐Need to be returned, ☐Not need
	Sampling by: MPRL	Expected analysis report due date : 12/8/2020
	Sampling Service; ☐No Use, ☐Use (Sampling date: Sampling by:)	

Sample details	No.	Sampling Date → 26.7.20	26.7.20	26.7.20
	Sample name	WW-1	Z1SW-1	Z1SW-2	Z1GW-1

Sample information					
Type of water	■Drinking water	☐Drinking water	☐Drinking water	☐Drinking water
	☐Surface water (river, lake etc.)	☐Surface water (river, lake etc.)	☐Surface water (river, lake etc.)	☐Surface water (river, lake etc.)
	☐Ground water	☐Ground water	☐Ground water	☐Ground water
	☐Saline/sea water	☐Saline/sea water	☐Saline/sea water	☐Saline/sea water
	☐Wastewater	■Wastewater	■Wastewater	■Wastewater
	☐Others ( )	☐Others ( )	☐Others ( )	☐Others ( )
Volume of sample container	500 mL/bottle	1 liter		
Q'ty of container	Total 2 bottles	1 bottle.		

Analysis parameter	WW-1	Z1SW-1	Z1SW-2	Z1GW-1
	■	☐	☐	☐
Total Nitrogen	■	■	■	■
	☐	☐	☐	☐
Chromium	■	■	■	■
	■	☐	☐	☐
Selenium	■	■	■	■
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Barium	☐	■	■	■
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Other request (if any)		4	4	4
*To be filled by GEM Lab — Sample No.	*******	W-2007179	W-2007180	W-2007181

LAB GEM

Remark(if any):

08089 08090 08091

*To be filled by GEM lab Application Received by: [signature]	Sample Received by: [signature]	Application No: (*our administration section)
Date: 28/7/20	Date: 28/7/20	0064 - C001

< Analysis Application Form >

Date: 28/7/20

Client's information (to be described in the tax invoice)	Client's information to be described in the analysis report (if it should be specified)
Client name: MPRL E&P Pte Ltd.	Client name:
Address of client: 623, Pyay Road, Vantage Tower	Address of Client:
Project name: - Mann Field Project	Project name: -
Tel No. / Email: 09449001927	Tel No. / Email:
Contact person/Position: Ma. Tin Nwe Win	Contact person/Position:

Sample information *To be filled by GEM Lab	
Sampling date:	Sample bottle(s): ☐Need to be returned, ☐Not need
Sampling by: MPRL	Expected analysis report due date : 12/8/2020
Sampling Service; ☐No Use, ☐Use (Sampling date:	Sampling by:)

Sample details		No.	Sampling Date → 26.7.20	25.7.20	25.7.20
		Sample name	WW-1	Z1GW-2	Z23W-1	Z23W-2
Sample information	Type of water	■Drinking water ☐Surface water (river, lake etc.) ☐Ground water ☐Saline/sea water ☐Wastewater ☐Others ( )	☐Drinking water ☐Surface water (river, lake etc.) ☐Ground water ☐Saline/sea water ■Wastewater ☐Others ( )	☐Drinking water ☐Surface water (river, lake etc.) ☐Ground water ☐Saline/sea water ■Wastewater ☐Others ( )	☐Drinking water ☐Surface water (river, lake etc.) ☐Ground water ☐Saline/sea water ■Wastewater ☐Others ( )
	Volume of sample container	500 mL/bottle	1 liter		
	Q'ty of container	Total 2 bottles	1 bottle.		
Analysis parameter		■	☐	☐	☐
	Total Nitrogen	■	■	■	■
		☐	☐	☐	☐
	Chromium	■	■	■	■
		■	☐	☐	☐
	Selenium	■	■	■	■
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	Barium	☐	■	■	■
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	Other request (if any)		4	4	4
*To be filled by GEM Lab	Sample No.	*******	W-2007182	W-2007183	W-2007184

LAB GEM

Remark(if any):

08092 08093 08094

*To be filled by GEM lab Application Received by: [signature] Date: 28/7/20	Sample Received by: [signature] Date: 28/7/20	Application No: (*our administration section) 0064 - C001

DOWA

GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD.
Lot No E1. Thilawa SEZ Zone A, Yangon Region, Myanmar.
Phone No Fax No: (+95) 1 2309051

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Doc No: GEM-LB-R003E/00
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< Analysis Application Form >

Date: 28/7/20

Client's information (to be described in the tax invoice)	Client's information to be described in the analysis report (if it should be specified)
Client name: MPRL E&P Pte Ltd.	Client name:
Address of client: 623, Pyay Road, Yankin	Address of client:
Project name: - Mann Field Project	Project name: -
Tel No. / Email: 09449001927	Tel No. / Email:
Contact person/Position: Ma. Tin Nwe Win	Contact person/Position:

Sample information *To be filled by GEM Lab	
Sampling date:	Sample bottle(s): ☐Need to be returned, ☐Not need
Sampling by: MPRL	Expected analysis report due date: 12/8/2020
Sampling Service; ☐No Use, ☐Use (Sampling date:	Sampling by:)

Sample details	No.	Sampling Date → 25.7.20	25.7.20	25.7.20
	Sample name	WW-1	72GW-1	72GW-2	73SW-1

Sample information	Type of water	■Drinking water ☐Surface water (river, lake etc.) ☐Ground water ☐Saline/sea water ☐Wastewater ☐Others ( )	☐Drinking water ☐Surface water (river, lake etc.) ☐Ground water ☐Saline/sea water ■Wastewater ☐Others ( )	☐Drinking water ☐Surface water (river, lake etc.) ☐Ground water ☐Saline/sea water ■Wastewater ☐Others ( )	☐Drinking water ☐Surface water (river, lake etc.) ☐Ground water ☐Saline/sea water ■Wastewater ☐Others ( )
	Volume of sample container	500 mL/bottle	1 liter		
	Q'ty of container	Total 2 bottles	1 bottle.		
Analysis parameter		■	☐	☐	☐
	Total Nitrogen	■	■	■	■
		☐	☐	☐	☐
	Chromium	■	■	■	■
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	Selenium	■	■	■	■
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	Barium	☐	■	■	■
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	Other request (if any)		4	4	4
*To be filled by GEM Lab	Sample No.	*******	W-2007185	W-2007186	W-2007187

LAB GEM

Remark(if any): 08095 08096 08097

*To be filled by GEM lab
Application Received by: [signature] Sample Received by: [signature] Application No: (*our administration section) 0064-0001

DOWA

GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD.
Lot No E1. Thilawa SEZ Zone A, Yangon Region, Myanmar.
Phone No Fax No: (+95) 1 2309051

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Doc No: GEM-LB-R003E/00
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< Analysis Application Form >

Date: 28/7/20

Client's information (to be described in the tax invoice)	Client's information to be described in the analysis report (if it should be specified)
Client name: MPRL E & P Pte Ltd.	Client name:
Address of client: 623, Pyay Road, Vantage Tower	Address of client:
Project name: - Mann Field Project	Project name: -
Tel No. / Email: 09449001927	Tel No. / Email:
Contact person/Position: Mg. Tin Nwe Win	Contact person/Position:

Sample information *To be filled by GEM Lab		
Sampling date:	Sample bottle(s): ☐Need to be returned, ☐Not need	
Sampling by: MPRL	Expected analysis report due date : 12/8/2020	
Sampling Service; ☐No Use, ☐Use (Sampling date:	Sampling by:	)

Sample details		No.	Sampling Date → 25.7.20	25.7.20	25.7.20
		Sample name	WW-1	Z3SW-2	Z3GW-1	Z3GW-2

Sample information		WW-1	Z3SW-2	Z3GW-1	Z3GW-2
Type of water		■Drinking water	☐Drinking water	☐Drinking water	☐Drinking water
		☐Surface water (river, lake etc.)	☐Surface water (river, lake etc.)	☐Surface water (river, lake etc.)	☐Surface water (river, lake etc.)
		☐Ground water	☐Ground water	☐Ground water	☐Ground water
		☐Saline/sea water	☐Saline/sea water	☐Saline/sea water	☐Saline/sea water
		☐Wastewater	■Wastewater	■Wastewater	■Wastewater
		☐Others ( )	☐Others ( )	☐Others ( )	☐Others ( )
Volume of sample container		500 mL/bottle	1 Liter		
Q'ty of container		Total 2 bottles	1 bottle.		

Analysis parameter	WW-1	Z3SW-2	Z3GW-1	Z3GW-2
	■	☐	☐	☐
Total Nitrogen	■	■	■	■
	☐	☐	☐	☐
Chromium	■	■	■	■
	■	☐	☐	☐
Selenium	■	■	■	■
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Other request (if any)		4	4	4
*To be filled by GEM Lab — Sample No.	*******	W-2007188	W-2007189	W-2007190

LAB GEM

Remark(if any):

08098 08099 08100

*To be filled by GEM lab
Application Received by: [signature]

Sample Received by: [signature]

Application No: (*our administration section)

DOWA

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Lot No E1. Thilawa SEZ Zone A, Yangon Region, Myanmar.
Phone No Fax No: (+95) 1 2309051

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Doc No: GEM-LB-R003E/00

< Analysis Application Form >

Date: 28/7/20

Client's information (to be described in the tax invoice)	Client's information to be described in the analysis report (if it should be specified)
Client name: MPRL E&P Pte Ltd.	Client name:
Address of client: 623, Pyay Road, Vantage Tower	Address of client:
Project name: - Mann Field Project	Project name: -
Tel No. / Email: 09449001927	Tel No. / Email:
Contact person/Position: Ma. Tin Nwe Win	Contact person/Position:

Sample information *To be filled by GEM Lab		
	Sampling date:	Sample bottle(s): ☐Need to be returned, ☐Not need
	Sampling by: MPRL	Expected analysis report due date: 12/8/2020
	Sampling Service; ☐No Use, ☐Use (Sampling date:	Sampling by:)

Sample details		No.	Sampling Date → 25.7.20	25.7.20	25.7.20
		Sample name: WW-1	Z4SW-1	Z4SW-2	Z4GW-2
Sample information	Type of water	■Drinking water ☐Surface water (river, lake etc.) ☐Ground water ☐Saline/sea water ☐Wastewater ☐Others ( )	☐Drinking water ☐Surface water (river, lake etc.) ☐Ground water ☐Saline/sea water ■Wastewater ☐Others ( )	☐Drinking water ☐Surface water (river, lake etc.) ☐Ground water ☐Saline/sea water ■Wastewater ☐Others ( )	☐Drinking water ☐Surface water (river, lake etc.) ☐Ground water ☐Saline/sea water ■Wastewater ☐Others ( )
	Volume of sample container	500 mL/bottle	1 liter		
	Q'ty of container	Total 2 bottles	1 bottle.		
Analysis parameter		■	☐	☐	☐
	Total Nitrogen	■	■	■	■
		☐	☐	☐	☐
	Chromium	■	■	■	■
		■	☐	☐	☐
	Selenium	■	■	■	■
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	Barium	☐	■	■	■
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	Other request (if any)		4	4	4
*To be filled by GEM Lab	Sample No.	*******	W-2007191	W-2007192	W-2007193

LAB GEM

Remark(if any):

08101 08102 08103

*To be filled by GEM lab
Application Received by: N/a

Sample Received by: N/a

Application No: (*our administration section) 00GH-C00[illegible]

ALARM Ecological Laboratory

Water Testing Result Report

Report Number : EL-WR-20-00877 **Date : 11-08-20**

Client Information

Client Name : **MPRL E&P Pte Ltd**
Organization : **MPRL E&P Pte Ltd**
Client ID : **LC-12-001**
Registration Date & Time : **29-07-20**
Contact : **9449001927**
Testing Purpose : **Monitoring**

Sample Information

Sample ID : WS-20-00831
Sample Name : **Z1GW-1**
Sample Type / Source : **Ground**
Sampling Date & Time : **26-07-20** 9:15 AM
Sample Location : **Pauk Su Village, Pwint Phyu Tsp, Magway**
Latitude : **20°19'40.01'**
Longitude : **94°49'18.27'**

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	Apparent Colour	4	HU	-	-
2	Turbidity	<5	FAU	≤5 (b)	Clear
3	TSS	0	mg/L	-	-
4	Conductivity	0.51	mS/cm	≤2.5 (b)	Normal
5	Hardness	250	mg/L	≤500 (c)	-
6	BOD5	4.3	mg/L	-	-
7	COD	<30	mg/L	-	-
8	Total Phosphorous	0.08	mg/L	-	-
9	Arsenic	0.01	mg/L	<0.01 (a)	Normal
10	Alkalinity	163	mg/L	-	-
11	Boron	<0.1	mg/L	<2.4 (a)	Normal
12	Fluoride	0.36	mg/L	<1.5 (a)	Normal
13	Oil & Grease	2	mg/L	-	-

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

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

531-D, Marlar Myaing Yeik Thar Street, 8 Ward, Kamayut Tsp, Yangon. Tel: 01-503301, 01-503302, 09 407496078
Email: aelab@alarmmyanmar.org, alarm.myanmar@gmail.com, Website: www.alarmmyanmar.org

ALARM Ecological Laboratory

Water Testing Result Report

Report Number : EL-WR-20-00878 **Date : 11-08-20**

Client Information

Client Name : **MPRL E&P Pte Ltd**
Organization : **MPRL E&P Pte Ltd**
Client ID : **LC-12-001**
Registration Date & Time : **29-07-20**
Contact : **9449001927**
Testing Purpose : **Monitoring**

Sample Information

Sample ID : WS-20-00832
Sample Name : **Z1GW-2**
Sample Type / Source : **Ground**
Sampling Date & Time : **26-07-20** 8:50 AM
Sample Location : **Pauk Su Village, Pwint Phyu Tsp, Magway**
Latitude : **20°19'45.22'**
Longitude : **94°49'20.51'**

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	Apparent Colour	29	HU	-	-
2	Turbidity	<5	FAU	≤5 (b)	Clear
3	TSS	1	mg/L	-	-
4	Conductivity	0.58	mS/cm	≤2.5 (b)	Normal
5	Hardness	250	mg/L	≤500 (c)	Normal
6	BOD5	3.3	mg/L	-	-
7	COD	<30	mg/L	-	-
8	Total Phosphorous	0.3	mg/L	-	-
9	Arsenic	0.005	mg/L	<0.01 (a)	Normal
10	Alkalinity	380	mg/L	-	Normal
11	Boron	1.5	mg/L	<2.4 (a)	Normal
12	Fluoride	0.27	mg/L	<1.5 (a)	Normal
13	Oil & Grease	2	mg/L	-	-

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

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

531-D, Marlar Myaing Yeik Thar Street, 8 Ward, Kamayut Tsp, Yangon. Tel: 01-503301, 01-503302, 09 407496078
Email: aelab@alarmmyanmar.org, alarm.myanmar@gmail.com, Website: www.alarmmyanmar.org

ALARM Ecological Laboratory

Water Testing Result Report

Report Number : EL-WR-20-00879 **Date : 11-08-20**

Client Information

Client Name : **MPRL E&P Pte Ltd**
Organization : **MPRL E&P Pte Ltd**
Client ID : **LC-12-001**
Registration Date & Time : **29-07-20**
Contact : **9449001927**
Testing Purpose : **Monitoring**

Sample Information

Sample ID : WS-20-00833
Sample Name : **Z2GW-1**
Sample Type / Source : **Ground**
Sampling Date & Time : **25-07-20** 10:15 AM
Sample Location : **Kyauk San Village, Minbu**
Latitude : **20° 15' 38.43" N**
Longitude : **94° 49' 59.29" E**

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	Apparent Colour	0	HU	-	-
2	Turbidity	<5	FAU	≤5 (b)	Clear
3	TSS	0	mg/L	-	-
4	Conductivity	0.8	mS/cm	≤2.5 (b)	Normal
5	Hardness	210	mg/L	≤500 (c)	-
6	BOD5	3.6	mg/L	-	-
7	COD	<30	mg/L	-	-
8	Total Phosphorous	0.31	mg/L	-	-
9	Arsenic	0.01	mg/L	<0.01 (a)	Normal
10	Alkalinity	320	mg/L	-	-
11	Boron	0.1	mg/L	<2.4 (a)	Normal
12	Fluoride	0.47	mg/L	<1.5 (a)	Normal
13	Oil & Grease	2	mg/L	-	-

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

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

531-D, Marlar Myaing Yeik Thar Street, 8 Ward, Kamayut Tsp, Yangon. Tel: 01-503301, 01-503302, 09 407496078
Email: aelab@alarmmyanmar.org, alarm.myanmar@gmail.com, Website: www.alarmmyanmar.org

ALARM Ecological Laboratory

Water Testing Result Report

Report Number : EL-WR-20-00880 **Date : 11-08-20**

Client Information

Client Name : **MPRL E&P Pte Ltd**
Organization : **MPRL E&P Pte Ltd**
Client ID : **LC-12-001**
Registration Date & Time : **29-07-20**
Contact : **9449001927**
Testing Purpose : **Monitoring**

Sample Information

Sample ID : WS-20-00834
Sample Name : **Z2GW-2**
Sample Type / Source : **Ground**
Sampling Date & Time : **25-07-20** 10:15 AM
Sample Location : **Kyauk San Village, Minbu Tsp, Magway**
Latitude : **20°15'39.50'**
Longitude : **94°50'5.51'**

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	Apparent Colour	0	HU	-	-
2	Turbidity	<5	FAU	≤5 (b)	Clear
3	TSS	0	mg/L	-	-
4	Conductivity	0.7	mS/cm	≤2.5 (b)	Normal
5	Hardness	90	mg/L	≤500 (c)	-
6	BOD5	3.8	mg/L	-	-
7	COD	<30	mg/L	-	-
8	Total Phosphorous	0.3	mg/L	-	-
9	Arsenic	0.005	mg/L	<0.01 (a)	Normal
10	Alkalinity	220	mg/L	-	-
11	Boron	<0.1	mg/L	<2.4 (a)	Normal
12	Fluoride	0.57	mg/L	<1.5 (a)	Normal
13	Oil & Grease	3	mg/L	-	-

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

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

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Email: aelab@alarmmyanmar.org, alarm.myanmar@gmail.com, Website: www.alarmmyanmar.org

ALARM Ecological Laboratory

Water Testing Result Report

Report Number : EL-WR-20-00881 **Date : 11-08-20**

Client Information

Client Name : **MPRL E&P Pte Ltd**
Organization : **MPRL E&P Pte Ltd**
Client ID : **LC-12-001**
Registration Date & Time : **29-07-20**
Contact : **9449001927**
Testing Purpose : **Monitoring**

Sample Information

Sample ID : **WS-20-00835**
Sample Name : **Z3GW-1**
Sample Type / Source : **Ground**
Sampling Date & Time : **25-07-20** 8:50 AM
Sample Location : **Kywe Gya Village, Minbu**
Latitude : **20° 15' 5.35" N**
Longitude : **94° 50' 54.52" E**

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	Apparent Colour	0	HU	-	-
2	Turbidity	<5	FAU	≤5 (b)	Clear
3	TSS	0	mg/L	-	-
4	Conductivity	2.1	mS/cm	≤2.5 (b)	Normal
5	Hardness	135	mg/L	≤500 (c)	-
6	BOD5	3.3	mg/L	-	-
7	COD	<30	mg/L	-	-
8	Total Phosphorous	0.13	mg/L	-	-
9	Arsenic	0	mg/L	<0.01 (a)	Normal
10	Alkalinity	230	mg/L	-	-
11	Boron	0.3	mg/L	<2.4 (a)	Normal
12	Fluoride	0.85	mg/L	<1.5 (a)	Normal
13	Oil & Grease	2	mg/L	-	-

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

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

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ALARM Ecological Laboratory

Water Testing Result Report

Report Number : EL-WR-20-00882 **Date : 11-08-20**

Client Information

Client Name : **MPRL E&P Pte Ltd**
Organization : **MPRL E&P Pte Ltd**
Client ID : **LC-12-001**
Registration Date & Time : **29-07-20**
Contact : **9449001927**
Testing Purpose : **Monitoring**

Sample Information

Sample ID : WS-20-00836
Sample Name : **Z3GW-2**
Sample Type / Source : **Ground**
Sampling Date & Time : **25-07-20** 8:05 AM
Sample Location : **Kywe Gya Village, Minbu**
Latitude : **20° 11' 37.92" N**
Longitude : **94° 52' 29.67" E**

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	Apparent Colour	0	HU	-	-
2	Turbidity	<5	FAU	≤5 (b)	Clear
3	TSS	0	mg/L	-	-
4	Conductivity	0.77	mS/cm	≤2.5 (b)	Normal
5	Hardness	125	mg/L	≤500 (c)	-
6	BOD5	3.7	mg/L	-	-
7	COD	<30	mg/L	-	-
8	Total Phosphorous	0.34	mg/L	-	-
9	Arsenic	0	mg/L	<0.01 (a)	Normal
10	Alkalinity	230	mg/L	-	-
11	Boron	0.9	mg/L	<2.4 (a)	Normal
12	Fluoride	0.83	mg/L	<1.5 (a)	Normal
13	Oil & Grease	2	mg/L	-	-

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

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

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ALARM Ecological Laboratory

Water Testing Result Report

Report Number : EL-WR-20-00883 **Date : 11-08-20**

Client Information

Client Name : **MPRL E&P Pte Ltd**
Organization : **MPRL E&P Pte Ltd**
Client ID : **LC-12-001**
Registration Date & Time : **29-07-20**
Contact : **9449001927**
Testing Purpose : **Monitoring**

Sample Information

Sample ID : WS-20-00837
Sample Name : **Z4GW-2**
Sample Type / Source : **Ground**
Sampling Date & Time : **25-07-20** 6:31 AM
Sample Location : **Shwe War Gone Ward, Minbu**
Latitude : **20° 11' 29.50" N**
Longitude : **94° 52' 27.85" E**

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	Drinking Standards	Remarks
1	Apparent Colour	0	HU	-	-
2	Turbidity	<5	FAU	≤5 (b)	Clear
3	TSS	0	mg/L	-	-
4	Conductivity	1.3	mS/cm	≤2.5 (b)	Normal
5	Hardness	925	mg/L	≤500 (c)	-
6	BOD5	4.2	mg/L	-	-
7	COD	<30	mg/L	-	-
8	Total Phosphorous	0.19	mg/L	-	-
9	Arsenic	0	mg/L	<0.01 (a)	Normal
10	Alkalinity	850	mg/L	-	-
11	Boron	1.2	mg/L	<2.4 (a)	Normal
12	Fluoride	2	mg/L	<1.5 (a)	Above the limit
13	Oil & Grease	1	mg/L	-	-

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

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

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Email: aelab@alarmmyanmar.org, alarm.myanmar@gmail.com, Website: www.alarmmyanmar.org

ALARM Ecological Laboratory

Water Testing Result Report

Report Number : EL-WR-20-00869 **Date : 11-08-20**

Client Information

Client Name : **MPRL E&P Pte Ltd**
Organization : **MPRL E&P Pte Ltd**
Client ID : **LC-12-001**
Registration Date & Time : **29-07-20**
Contact : **9449001927**
Testing Purpose : **Monitoring**

Sample Information

Sample ID : WS-20-00823
Sample Name : **Z1SW-1**
Sample Type / Source : **Raw/Natural**
Sampling Date & Time : **26-07-20** 8:25 AM
Sample Location : **Mone Creek, Pauk Su Village, Pwint Phyu Tsp, Magway**
Latitude : **20°19'47.67'**
Longitude : **94°49'6.88'**

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	Drinking Standards	Remarks
1	Apparent Colour	33	HU	-	-
2	Turbidity	<5	FAU	≤5 (b)	Clear
3	TSS	3	mg/L	-	-
4	Conductivity	0.35	mS/cm	≤2.5 (b)	Normal
5	Hardness	150	mg/L	≤500 (c)	-
6	BOD5	5.2	mg/L	-	-
7	COD	<30	mg/L	-	-
8	Total Phosphorous	0.08	mg/L	-	-
9	Arsenic	0	mg/L	<0.01 (a)	Normal
10	Alkalinity	141	mg/L	-	-
11	Boron	0.1	mg/L	<2.4 (a)	Normal
12	Fluoride	0.58	mg/L	<1.5 (a)	Normal
13	Oil & Grease	5	mg/L	-	-

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

531-D, Marlar Myaing Yeik Thar Street, 8 Ward, Kamayut Tsp, Yangon. Tel: 01-503301, 01-503302, 09 407496078
Email: aelab@alarmmyanmar.org, alarm.myanmar@gmail.com, Website: www.alarmmyanmar.org

ALARM Ecological Laboratory

Water Testing Result Report

Report Number : EL-WR-20-00870 **Date : 11-08-20**

Client Information

Client Name : **MPRL E&P Pte Ltd**
Organization : **MPRL E&P Pte Ltd**
Client ID : **LC-12-001**
Registration Date & Time : **29-07-20**
Contact : **9449001927**
Testing Purpose : **Monitoring**

Sample Information

Sample ID : WS-20-00824
Sample Name : **Z1SW-2**
Sample Type / Source : **Raw**
Sampling Date & Time : **26-07-20** 8:30 AM
Sample Location : **Mone Creek Down-Stream, Pauk Su Village, Pwint Phyu Township, Magway**
Latitude : **20°19'57.80'**
Longitude : **94°49'10.19'**

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	Apparent Colour	0	HU	-	-
2	Turbidity	<5	FAU	≤5 (b)	Clear
3	TSS	1	mg/L	-	-
4	Conductivity	0.34	mS/cm	≤2.5 (b)	Normal
5	Hardness	125	mg/L	≤500 (c)	-
6	BOD5	4.3	mg/L	-	-
7	COD	<30	mg/L	-	-
8	Total Phosphorous	0.15	mg/L	-	-
9	Arsenic	0	mg/L	<0.01 (a)	Normal
10	Alkalinity	163	mg/L	-	-
11	Boron	<0.1	mg/L	<2.4 (a)	Normal
12	Fluoride	0.13	mg/L	<1.5 (a)	Normal
13	Oil & Grease	6	mg/L	-	-

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

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ALARM Ecological Laboratory

Water Testing Result Report

Report Number : EL-WR-20-00871 **Date : 11-08-20**

Client Information

Client Name : **MPRL E&P Pte Ltd**
Organization : **MPRL E&P Pte Ltd**
Client ID : **LC-12-001**
Registration Date & Time : **29-07-20**
Contact : **9449001927**
Testing Purpose : **Monitoring**

Sample Information

Sample ID : WS-20-00825
Sample Name : **Z2SW-1**
Sample Type / Source : **Raw**
Sampling Date & Time : **25-07-20** 11:25 AM
Sample Location : **Mann Creek, Kyauk San Village, Min Buu Tsp, Magway**
Latitude : **20°15'29.55'**
Longitude : **94°50'1.86'**

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	Apparent Colour	1	HU	-	-
2	Turbidity	<5	FAU	≤5 (b)	Clear
3	TSS	1	mg/L	-	-
4	Conductivity	0.41	mS/cm	≤2.5 (b)	Normal
5	Hardness	190	mg/L	≤500 (c)	-
6	BOD5	3.3	mg/L	-	-
7	COD	<30	mg/L	-	-
8	Total Phosphorous	0.21	mg/L	-	-
9	Arsenic	0	mg/L	<0.01 (a)	Normal
10	Alkalinity	166	mg/L	-	-
11	Boron	1.2	mg/L	<2.4 (a)	Normal
12	Fluoride	0.25	mg/L	<1.5 (a)	Normal
13	Oil & Grease	5	mg/L	-	-

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

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Email: aelab@alarmmyanmar.org, alarm.myanmar@gmail.com, Website: www.alarmmyanmar.org

ALARM Ecological Laboratory

Water Testing Result Report

Report Number : EL-WR-20-00872 **Date : 11-08-20**

Client Information

Client Name : **MPRL E&P Pte Ltd**
Organization : **MPRL E&P Pte Ltd**
Client ID : **LC-12-001**
Registration Date & Time : **29-07-20**
Contact : **9449001927**
Testing Purpose : **Moni9toring**

Sample Information

Sample ID : WS-20-00826
Sample Name : **Z2SW-2**
Sample Type / Source : **Raw**
Sampling Date & Time : **25-07-20** 8:30 AM
Sample Location : **Man Creek, Near Kywe Gya Village, Minbu Tsp, Magway**
Latitude : **20°15'33.13'**
Longitude : **94°51'0.27'**

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	Apparent Colour	0	HU	-	-
2	Turbidity	<5	FAU	≤5 (b)	Clear
3	TSS	0	mg/L	-	-
4	Conductivity	0.4	mS/cm	≤2.5 (b)	Normal
5	Hardness	175	mg/L	≤500 (c)	-
6	BOD5	3	mg/L	-	-
7	COD	<30	mg/L	-	-
8	Total Phosphorous	0.16	mg/L	-	-
9	Arsenic	0	mg/L	<0.01 (a)	Normal
10	Alkalinity	165	mg/L	-	-
11	Boron	<0.1	mg/L	<2.4 (a)	Normal
12	Fluoride	0.12	mg/L	<1.5 (a)	Normal
13	Oil & Grease	4	mg/L	-	-

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

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Email: aelab@alarmmyanmar.org, alarm.myanmar@gmail.com, Website: www.alarmmyanmar.org

ALARM Ecological Laboratory

Water Testing Result Report

Report Number : EL-WR-20-00873 **Date : 11-08-20**

Client Information

Client Name : **MPRL E&P Pte Ltd**
Organization : **MPRL E&P Pte Ltd**
Client ID : **LC-12-001**
Registration Date & Time : **29-07-20**
Contact : **9449001927**
Testing Purpose : **Monitoring**

Sample Information

Sample ID : WS-20-00827
Sample Name : **Z3SW-1**
Sample Type / Source : **Raw**
Sampling Date & Time : **25-07-20** 9:05 AM
Sample Location : **Mann Creek, Near Kywe Gya Village, Minbu Tsp, Magway**
Latitude : **20°14'46.51'**
Longitude : **94°51'0.27**

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	Apparent Colour	403	HU	-	-
2	Turbidity	64	FAU	≤5 (b)	Turbid
3	TSS	69	mg/L	-	-
4	Conductivity	0.14	mS/cm	≤2.5 (b)	Normal
5	Hardness	75	mg/L	≤500 (c)	-
6	BOD5	3.8	mg/L	-	-
7	COD	<30	mg/L	-	-
8	Total Phosphorous	0.23	mg/L	-	-
9	Arsenic	0	mg/L	<0.01 (a)	Normal
10	Alkalinity	51	mg/L	-	-
11	Boron	<0.1	mg/L	<2.4 (a)	Normal
12	Fluoride	0	mg/L	<1.5 (a)	Normal
13	Oil & Grease	4	mg/L	-	-

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Tested by	Checked by	Approved by
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Email: aelab@alarmmyanmar.org, alarm.myanmar@gmail.com, Website: www.alarmmyanmar.org

ALARM Ecological Laboratory

Water Testing Result Report

Report Number : EL-WR-20-00874 **Date : 11-08-20**

Client Information

Client Name : **MPRL E&P Pte Ltd**
Organization : **MPRL E&P Pte Ltd**
Client ID : **LC-12-001**
Registration Date & Time : **29-07-20**
Contact : **9449001927**
Testing Purpose : **Monitoring**

Sample Information

Sample ID : **WS-20-00828**
Sample Name : **Z3SW-2**
Sample Type / Source : **Raw**
Sampling Date & Time : **25-07-20** 8:30 AM
Sample Location : **Mann Creek, Down-Stream, Near Kywe Gya Village, Minbu Tsp, Magway**
Latitude : **20°14'45.74'**
Longitude : **94°51'1.87'**

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	Apparent Colour	367	HU	-	-
2	Turbidity	49	FAU	≤5 (b)	Turbid
3	TSS	55	mg/L	-	-
4	Conductivity	0.15	mS/cm	≤2.5 (b)	Normal
5	Hardness	60	mg/L	≤500 (c)	-
6	BOD5	4.1	mg/L	-	-
7	COD	<30	mg/L	-	-
8	Total Phosphorous	0.21	mg/L	-	-
9	Arsenic	0	mg/L	<0.01 (a)	Normal
10	Alkalinity	60	mg/L	-	-
11	Boron	<0.1	mg/L	<2.4 (a)	Normal
12	Fluoride	0.06	mg/L	<1.5 (a)	Normal
13	Oil & Grease	7	mg/L	-	-

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

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

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Email: aelab@alarmmyanmar.org, alarm.myanmar@gmail.com, Website: www.alarmmyanmar.org

ALARM Ecological Laboratory

Water Testing Result Report

Report Number : EL-WR-20-00875 **Date : 11-08-20**

Client Information

Client Name : **MPRL E&P Pte Ltd**
Organization : **MPRL E&P Pte Ltd**
Client ID : **LC-12-001**
Registration Date & Time : **29-07-20**
Contact : **9449001927**
Testing Purpose : **Monitoring**

Sample Information

Sample ID : **WS-20-00829**
Sample Name : **Z4SW-1**
Sample Type / Source : **Raw**
Sampling Date & Time : **25-07-20** 7:00 AM
Sample Location : **Near West Bank of Ayeyarwady River, Minbu Tsp, Magway**
Latitude : **20°11'41.31'**
Longitude : **94°52'41.11'**

Testing Results

This laboratory analysis report is based solely on the sample submitted by the client unless client took our sampling service.

Sr.	Quality Parameters	Results	Units	Drinking Standards	Remarks
1	Apparent Colour	740	HU	-	-
2	Turbidity	109	FAU	≤5 (b)	Turbid
3	TSS	108	mg/L	-	-
4	Conductivity	0.19	mS/cm	≤2.5 (b)	Normal
5	Hardness	60	mg/L	≤500 (c)	-
6	BOD5	3.6	mg/L	-	-
7	COD	<30	mg/L	-	-
8	Total Phosphorous	0.33	mg/L	-	-
9	Arsenic	0	mg/L	<0.01 (a)	Normal
10	Alkalinity	39	mg/L	-	-
11	Boron	<0.1	mg/L	<2.4 (a)	Normal
12	Fluoride	0	mg/L	<1.5 (a)	Normal
13	Oil & Grease	5	mg/L	-	-

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

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

531-D, Marlar Myaing Yeik Thar Street, 8 Ward, Kamayut Tsp, Yangon. Tel: 01-503301, 01-503302, 09 407496078
Email: aelab@alarmmyanmar.org, alarm.myanmar@gmail.com, Website: www.alarmmyanmar.org

ALARM Ecological Laboratory

Water Testing Result Report

Report Number : EL-WR-20-00876 **Date : 11-08-20**

Client Information

Client Name : **MPRL E&P Pte Ltd**
Organization : **MPRL E&P Pte Ltd**
Client ID : **LC-12-001**
Registration Date & Time : **29-07-20**
Contact : **9449001927**
Testing Purpose : **Monitoring**

Sample Information

Sample ID : WS-20-00830
Sample Name : **Z4SW-2**
Sample Type / Source : **Raw**
Sampling Date & Time : **25-07-20** 7:00 AM
Sample Location : **Ayeyarwady River, Down-stream**
Latitude : **20° 11' 38.80" N**
Longitude : **94° 52' 42.50" E**

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	Apparent Colour	422	HU	-	-
2	Turbidity	41	FAU	≤5 (b)	Turbid
3	TSS	47	mg/L	-	-
4	Conductivity	0.13	mS/cm	≤2.5 (b)	Normal
5	Hardness	70	mg/L	≤500 (c)	-
6	BOD5	3.8	mg/L	-	-
7	COD	<30	mg/L	-	-
8	Total Phosphorous	0.26	mg/L	-	-
9	Arsenic	0	mg/L	<0.01 (a)	Normal
10	Alkalinity	33	mg/L	-	-
11	Boron	<0.1	mg/L	<2.4 (a)	Normal
12	Fluoride	0	mg/L	<1.5 (a)	Normal
13	Oil & Grease	2	mg/L	-	-

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

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

531-D, Marlar Myaing Yeik Thar Street, 8 Ward, Kamayut Tsp, Yangon. Tel: 01-503301, 01-503302, 09 407496078
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Build through Excellence
Lead with Integrity

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