



Max Myanmar
Manufacturing Co., Ltd



Environmental Quality Monitoring Report for Limestone Mining at Taung Philar Mountain

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CHAPTER 1

ENVIRONMENTAL QUALITY MONITORING REPORT

1.1. INTRODUCTION

Max Myanmar Manufacturing Co., Ltd (project proponent) received a letter of approval from the Ministry of Natural Resource and Environmental Conservation, Environment Conservation Department of Naypyitaw on September 14, 2021 for the Environmental Management Plan (EMP) report of the limestone mining area. The project proponent requested Hexagonal Angle International Consultants Co., Ltd. to implement the Environmental Monitoring Report for the limestone mining.

The project proponent has responsibility to carry out regular monitoring in the limestone mining area and monitoring period is within 6 months after receiving the approval letter of EMP report. In addition, the proponent has implemented monitoring various environmental items with the specific time frame to know the environmental conditions in and around the area. The environmental quality monitoring includes outdoor air quality measurement, temperature, noise measurement, vibration measurement, soil quality measurement (surface soil) and water quality testing. During the monitoring period, the average temperature of project location was 30.9°C.

Moreover, outdoor air quality, temperature and humidity are measured by using the EPAS - HAZ Scanner device. Outdoor air quality parameters such as PM₁₀, CH₄, CO, CO₂, HC, H₂S, NO₂, O₂ and SO₂ were also monitored by EPAS-HAZ Scanner device. The water quality samples are collected and analyzed by the various methods of each parameter in a laboratory. Noise measurement was conducted by the Digital Sound Level Meter (GM-1356) and vibration measurement was carried out by the BENETECH vibration meter (GM-63B). The detailed information of the measurement results and measurement devices are mentioned in the **APPENDIX- A, B, C and D**.

1.1.1. Purpose

The purpose of the Monitoring report is to evaluate the existing environmental conditions in limestone mining area. This report will be provided to proponent and employees to assist them in carrying out the project to avoid or minimize the impacts to environment. To make a monitoring report every 6 months according to the Environmental Impact Assessment (EIA) procedure. To assess the impact on the operation stage of limestone mining area to the surrounding environment, air quality, noise and vibration level had been monitored from January 24th to 27th, 2022 as shown in Table 1-1 and the outlines of monitoring plan in the EMP report as shown in Table 1-2.

Table 1-1 Outlines of Monitoring Item in the monitoring report

Monitoring Date	Monitoring Item	Parameters	Number of Point	Location	Duration	Monitoring Methodology
24 th January 2022 – 27 th January 2022	Air Quality	SO ₂ , NO ₂ , PM	3	Mining area, Aung Nan Cho village and Tae Kyi Kone village	4 Days	On site measurement by Haz-Scanner Environmental Perimeter Air Station (EPAS)
25 th January 2022 – 26 th January 2022	Noise Level	LAeq (dB)	3	Mining area, Aung Nan Cho village and Tae Kyi Kone village	24 hours	On site measurement by “BENETECH GM-1356 digital sound level meter”
25 th January 2022 – 26 th January 2022	Vibration Level	Lv10 (dB)	3	Mining area, Aung Nan Cho village and Tae Kyi Kone village	24 hours	On-site measurement by “BENETECH vibration meter- VM-53A”
26 th January 2022	Water Quality	COD, BOD, Total Suspended Solids, Phosphate, Nitrate and Oil & Grease	1	Yay Pu Stream	-	Laboratory test
25 th January 2022	Soil Quality	Moisture, pH, texture, total Nitrogen & nutrients	2	Aung Nan Cho village and Tae Kyi Kone village	-	Laboratory test

Table 1-2 Outlines of Monitoring Plan in the Environmental Management Plan report with approval letter

Monitoring Item	Parameters	Objectives	Location	Frequency
Air Quality	SO ₂ , NO ₂ , PM	<ul style="list-style-type: none"> Detecting changes in air quality. Check for compliance with air quality standards (NEQEG, emission, guideline values, 2015, ECD) 	At sensitive receptors coordinates: N. Lat. 19° 31' 25", E. Long. 96° 24' 26"; N. Lat. 19° 31' 5", E. Long. 96° 24' 12"; N. Lat. 19° 31' 48", E. Long. 96° 24' 5"	Semi-annually
Noise and Vibration	LAeq (dB), Lv10 (dB)	<ul style="list-style-type: none"> Detecting changes in noise and vibration level. Check for compliance with noise level standards (NEQEG, emission, guideline values, 2015, ECD) 	At sensitive receptors coordinates: N. Lat. 19° 31' 25", E. Long. 96° 24' 26"; N. Lat. 19° 31' 5", E. Long. 96° 24' 12"; N. Lat. 19° 31' 48", E. Long. 96° 24' 5"	Semi-annually
Surface Water Quality (Yay-pu Chaung)	COD, BOD, Total Suspended Solids, Phosphate, Nitrate and Oil & Grease	<ul style="list-style-type: none"> Detecting changes in surface water quality. Check for compliance with water quality standards (WHO) Guideline values 	At on-site water bodies effected by the mine coordinates: N. Lat. 19° 31' 12.00", E. Long. 96° 24' 5.63"	Semi-annually

Monitoring Item	Parameters	Objectives	Location	Frequency
Soil Quality	Moisture, pH, texture, total Nitrogen & nutrients	<ul style="list-style-type: none"> Detecting changes in soil quality. 	At sensitive receptors coordinates: N. Lat. 19° 31' 5", E. Long. 96° 24' 12"; N. Lat. 19° 31' 48", E. Long. 96° 24' 5"	Semi-annually

1.1.2. Overview of the Project Area

Environmental quality monitoring for operation stage was conducted by Hexagonal Angle Consulting Team at limestone mining site of Max Myanmar Manufacturing Co., Ltd. from January 24th to 26th, 2022. The proposed project site is elongated in shape from north to south and the size is 230 acres and situated at the coordinates Lat 19° 31' 25" N, Long. 96° 24' 26" E. It is on the eastern slope of Taung Philar Mountain range, Taung Philar area, Leiway Township, Naypyidaw and 2 miles away from the factory. One mile away in the south is Aung-Nan-Cho Village, under the Zali-Nget-Gyi Taung Village tract. The location map of the project area as shown in Figure 1-1. The project site is located 10 miles east of the Yangon-Mandalay highway which is 25.5 miles southeast of Naypyidaw.

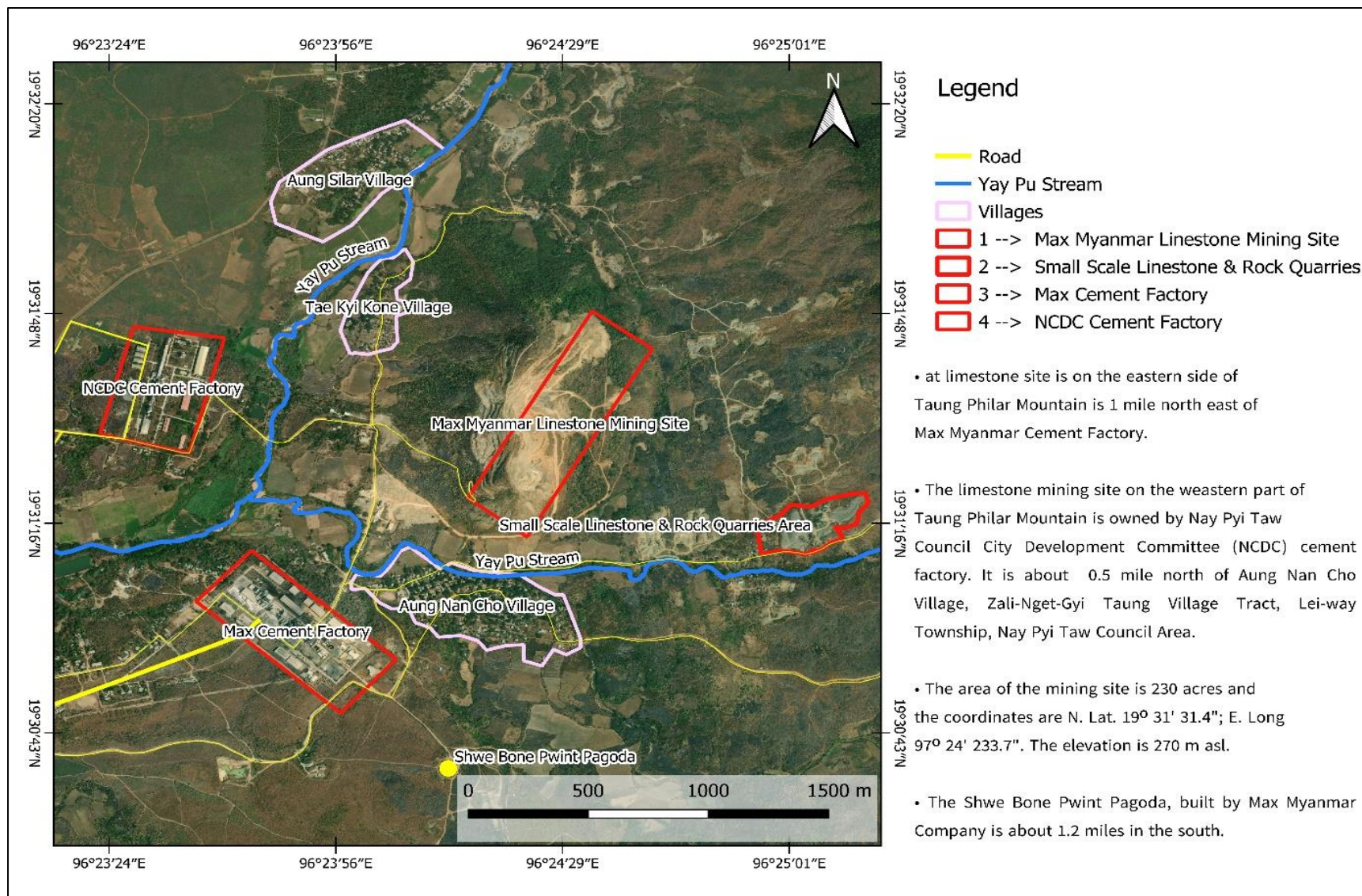


Figure 1-1 Overview Map of the Project Area

1.2. BASELINE ENVIRONMENTAL QUALITY

1.2.1. Outdoor Air Quality

By using the EPAS-Haz Scanner, the outdoor Air quality measurement was conducted from January 24th to 27th, 2022 at three locations, namely the limestone mining site which is 0.8 km far from the Max Myanmar Cement Factory, Aung Nan Cho village and Tae Kyi Kone village from 0.7 km and 0.9 km from the limestone mining site respectively. The air quality monitoring stations and measurement photos are described in Figure 1-2 and-Figure 1-3.

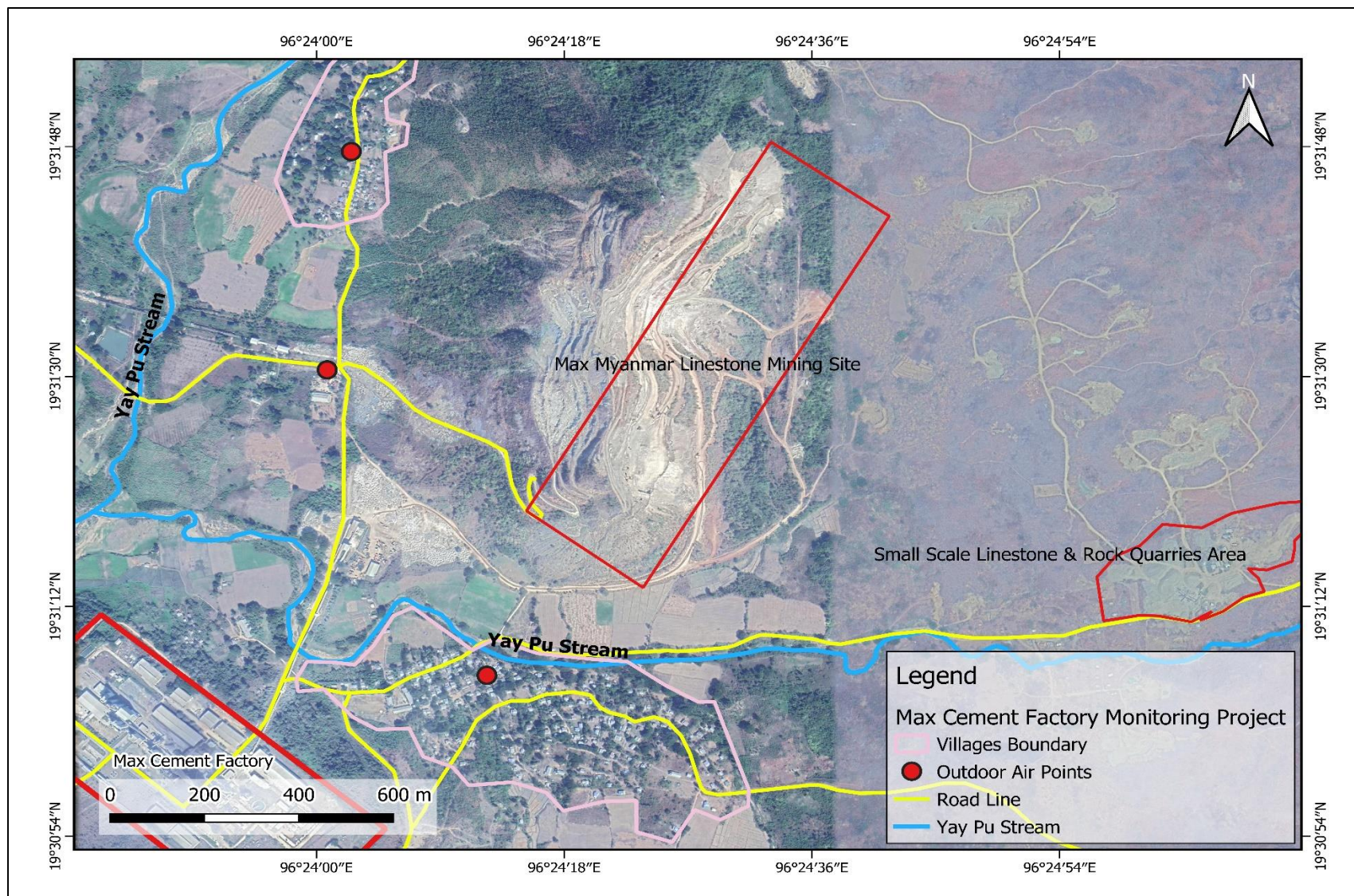


Figure 1-2 Outdoor Air Quality Measurement Location (24 Hours Measurement)



Figure 1-3 Air Quality Monitoring (24th to 26th December 2022)

The limestone industry has some air emissions which produce several harmful gaseous pollutants into the atmosphere especially particulate matters release from the mine site areas and using vehicles for transportation and it may cause some major health issues related with respiratory system. HA's Environmental Team and Max Myanmar environmental monitoring team conducted the outdoor air quality measurements such as particulate matter (PM₁₀), gas (NO₂, CO, SO₂, CH₄, HS, H₂S, CO₂ and O₂), relative etc. as displayed in Figure 1-3. These measurements were made in accordance with the guidelines of National Environmental Quality (Emission) Guidelines in the project site area. Both results of the study and guidelines are as shown in Table 1-3.

According to the results, values of particulate matter (PM₁₀) and sulfur dioxide (SO₂) are above the NEGEG standard guidelines (Analyzed Graph is shown in Figure 1-4 ,Figure 1-5, Figure 1-6,

Figure 1-7,Figure 1-8 and Figure 1-9. Specifically, SO₂, and PM₁₀ are exceeding between 11:41 AM to 21:41 AM at mining site, between 4:28 AM to 7:28 AM at Aung Nan Cho Village and between 11:41 AM to 21:41 PM at Tae Kyi Kone Village respectively. These exceeding results in the atmosphere are caused by the operation of the limestone mining process. However, other parameters such as Nitrogen Dioxide (NO₂), Carbon Monoxide (CO) and other rest parameters are within the standard limitations. The results of the air quality measurements in the EMP report, 2016 are shown

in Table 1-4 to compare the current results and to conduct mitigation measure for the parameters that above the guideline.

Table 1-3 Results of the Ambient Outdoor Air Monitoring Measurement

Sr	Parameter	Existing Values			NEQEG/WHO Guideline Value µg/m3
		At Mining Site	At Aung Nan Cho Village	At Tae Kyi Kone Village	
1	CH ₄ (ppm)	26857.2	26718.8	26218.9	NG
2	PM ₁₀ (ug/m ³) (24-hour)	58.9	63.8	66.8	50 (Above the guide line)
3	CO (ug/m ³) (8-hour)	0.0	0.1	0.1	30000 ppb
4	CO ₂ (ppb) (8 hour)	0.0	0.0	0.0	-
5	HC (ppb)	450.3	367.9	388.1	NG
6	H ₂ S (ppb)	0.0	0.0	0.0	NG
7	NO ₂ (ug/m ³)	5.8	8.5	27.1	40 (1-Year) 200 (1-hour)
8	O ₂	0.0	0.0	0.0	NG
9	SO ₂ (ug/m ³)	59.5	26.8	71.7	20 (24-hour) 500 (10-minute) (Above the guide line)

*National Environmental Quality (Emission) Guidelines (2015)

NG=No Guideline

Table 1-4 Air Quality measurements result in the EMP report (2016)

Sr	Parameter	Previous Values			NEQEG/WHO Guideline Value µg/m3
		At Mining Site	At Aung Nan Cho Village	At Tae Kyi Kone Village	
1	CH ₄ (ppm)	7543	7205	7457	NG
2	PM ₁₀ (ug/m ³) (24-hour)	43	24.2	24	50
3	PM _{2.5} (24-hour)	21	16.8	16	25
4	VOC ppb (1-hour)	36	32	6	400 ppb
5	CO (ppb) (8-hour)	287	275.5	900.1	30000 ppb
6	HC (ppb)	652	0	0	NG

7	NO ₂ (ug/m ³)	161	44.2	50.6	40 (1-Year) 200 (1-hour)
8	O ₃	92	67	54	NG
9	SO ₂ (ug/m ³) (24-hour)	35.2	33.3	30.8	20 (24-hour) 500 (10-minute)

*National Environmental Quality (Emission) Guidelines (2015)

NG=No Guideline

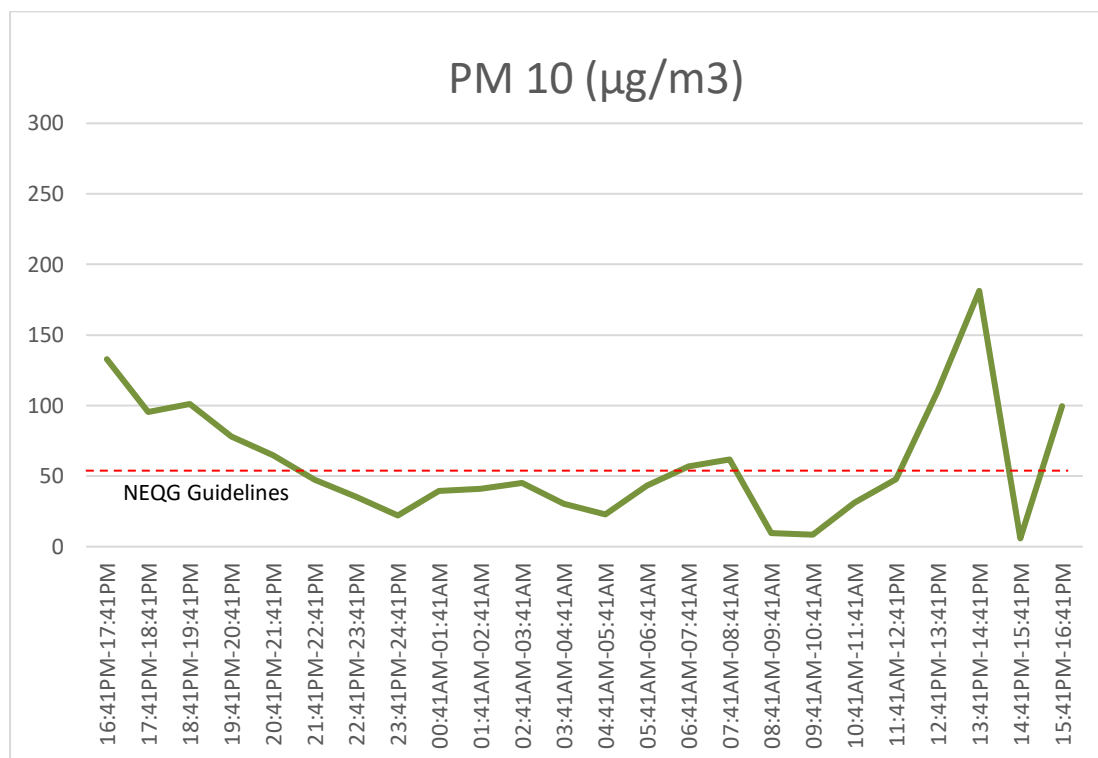


Figure 1-4 Graph for PM₁₀ Emission of Mining Site

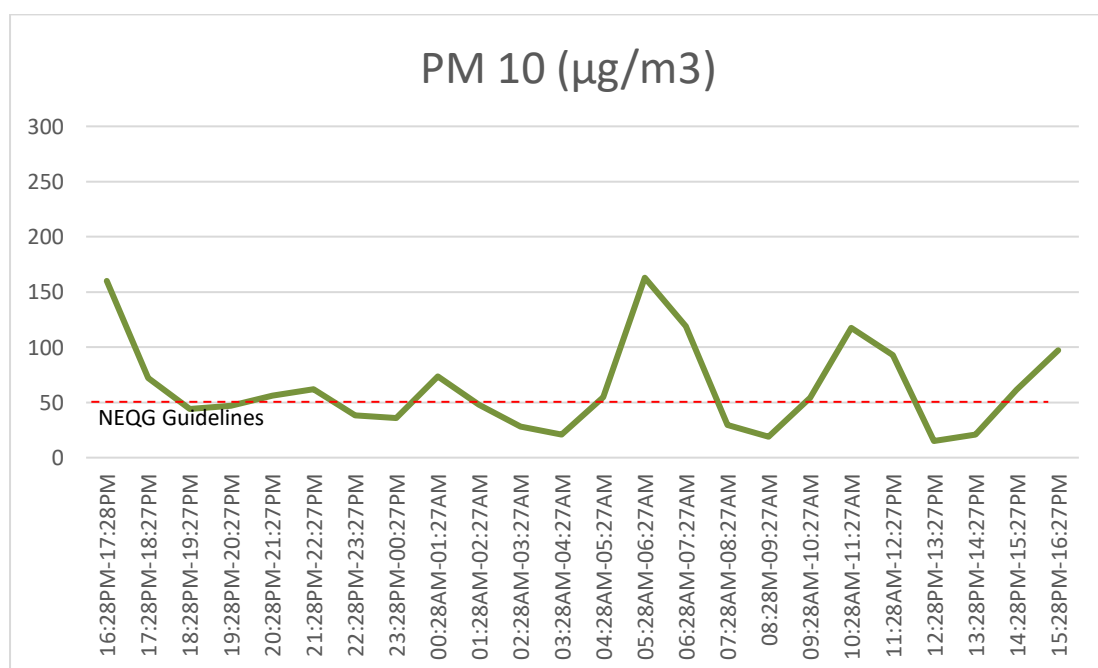


Figure 1-5 Graph for PM₁₀ Emission of Aung Nan Cho Village

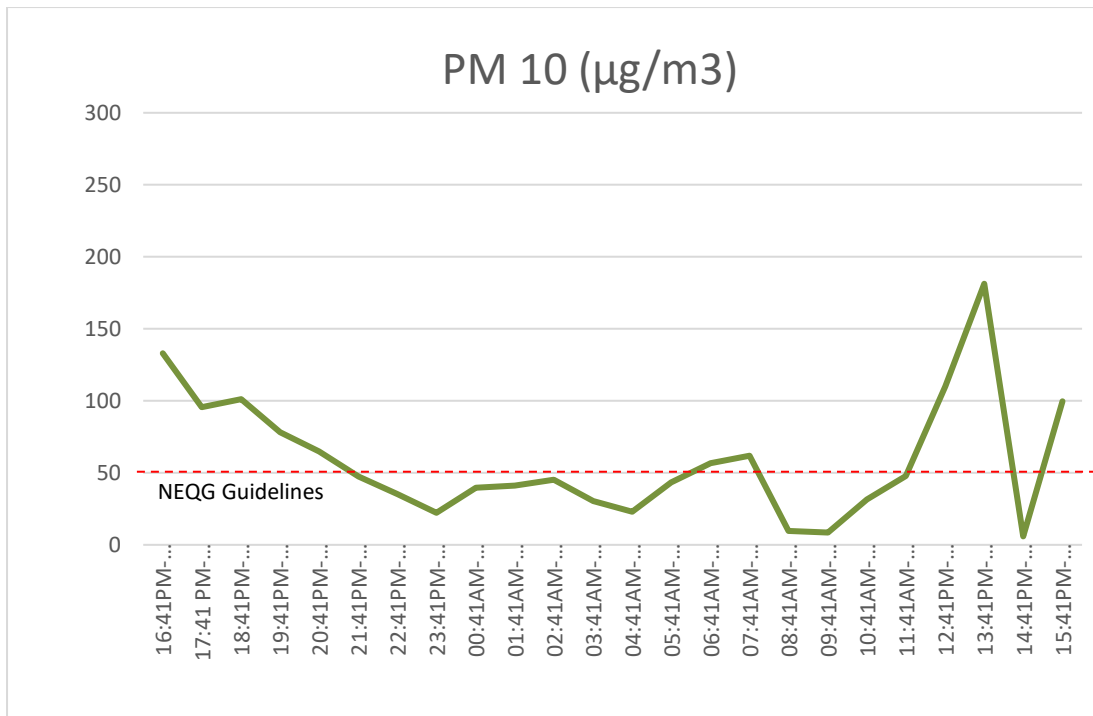


Figure 1-6 Graph for PM10 Emission of Tae Kyi Kone Village

Remark*:** PM₁₀ is exceeding above the guidelines due to the limestone mining operation process and vehicle movements. Compare to the previous measurement results at (2016), the current result of PM₁₀ is higher. Therefore, appropriate mitigation measure for PM₁₀ is required.

Mitigation Measure

- ✓ Do not clear the vegetation (and leave the ground bare) more than necessary
- ✓ Regular checkups and maintenance in vehicle and operation equipment
- ✓ Apply dust extractors, collectors, and filters at the drilling site; apply wet drilling if possible
- ✓ Do not blast when strong wind is blowing; blasting in the morning (07:00 - 08:30 hrs) generates less dust. Also consider meteorological facts (e.g., precipitation, temperature, wind direction)
- ✓ Also stop excavation, hauling, loading and unloading for a moment when strong wind is blowing
- ✓ If possible, apply wet processing at crushers and grinders (apply water sprays from time to time)
- ✓ Dust emissions from crusher, excavator, loader and dump truck will be adequately controlled through dust collectors, and water spraying
- ✓ Limit the drop height during unloading and loading the materials (gravel)
- ✓ If possible, use mobile and fixed belt transport and conveyors rather than hauling the materials (gravel) by trucks (use enclosed rubber-belt conveyors)
- ✓ Set up speed limit (slow speed) for truck to minimize emission of dust (a speed reduction from 30 km/hr to 15 km/hr will reduce 50% of dust emission)

- ✓ Spray water on un-paved road during dry months (wet suppression can greatly reduce dust emission up to 70%)
- ✓ Use and cover with tarpaulin to prevent the spill of gravel, overburden, and topsoil during transportation
- ✓ If possible, use water wash to minimize mud and dust track-out from the unpaved road area
- ✓ Regular cleaning of road surface by sweeping
- ✓ Use of windbreaker near the stockpile or plant rapidly growing vegetation around the mine site
- ✓ Avoid open burning of all kind of solid wastes; reuse and recycle them as far as possible and finally dispose them at approved land fill (dump site)
- ✓ Provide adequate PPE (masks, mouth and nose covers) to workers

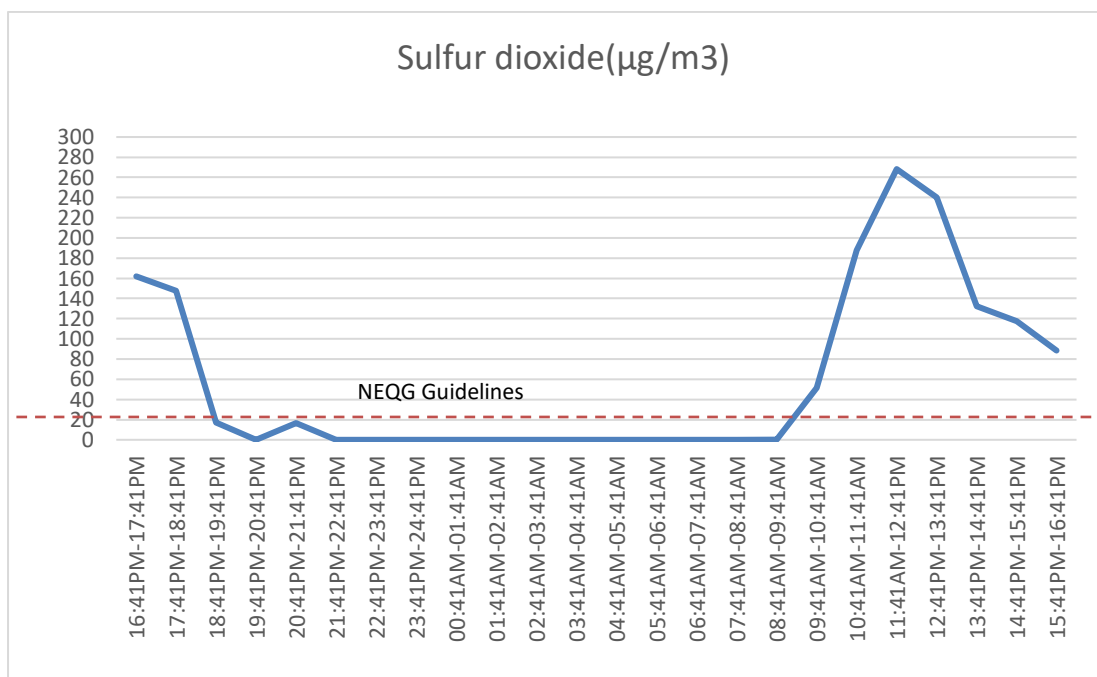


Figure 1-7 Graph for SO2 Emission of Mining Site Village

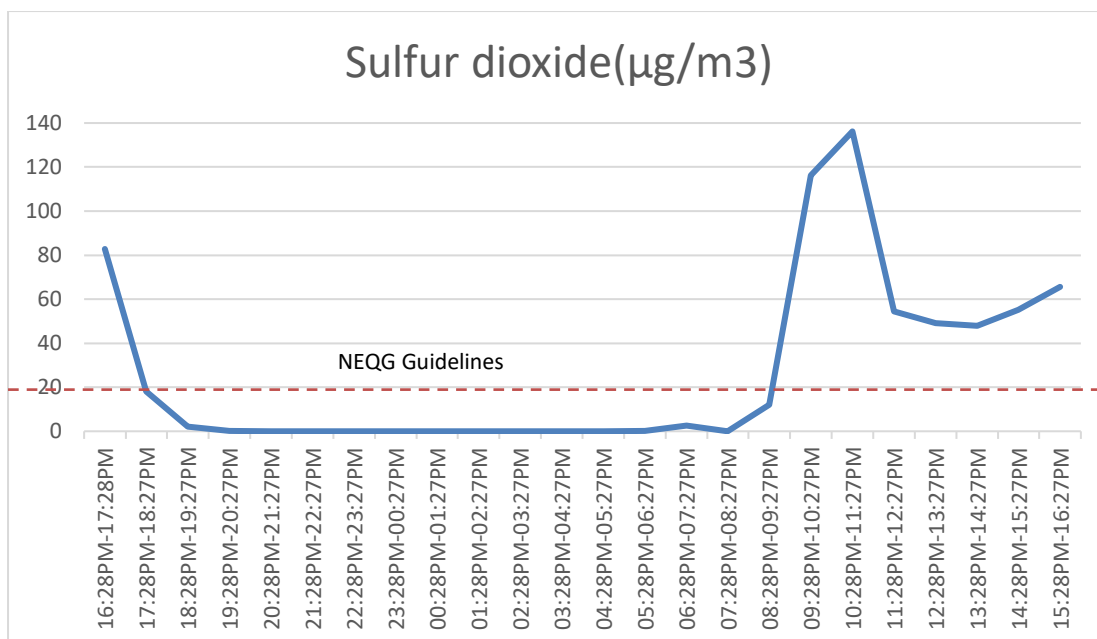


Figure 1-8 Graph for SO₂ Emission of Aung Nan Cho Village

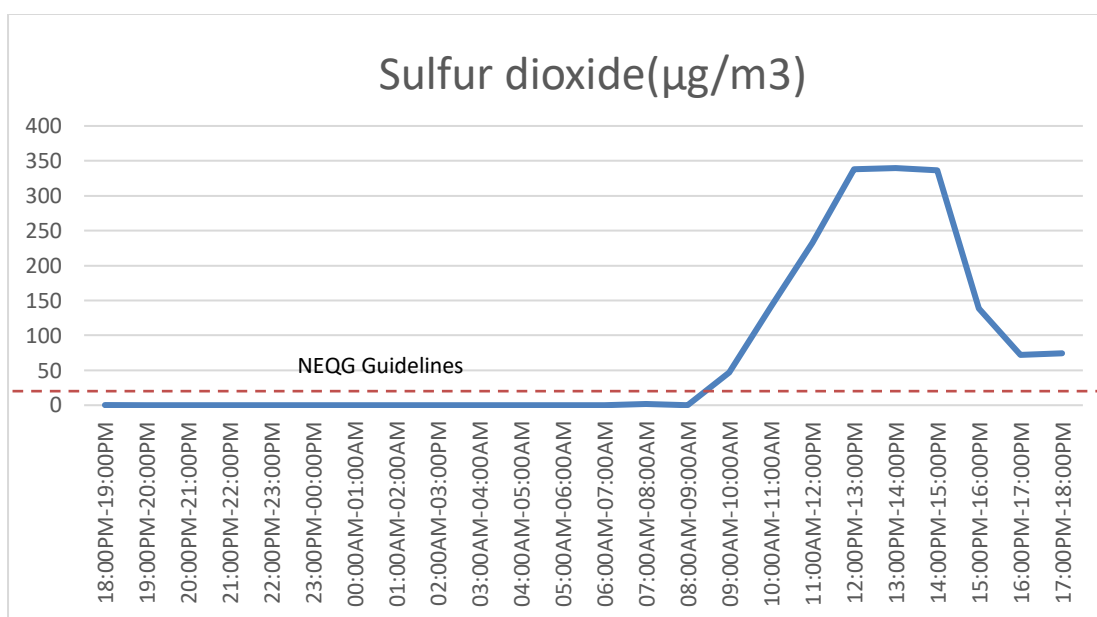


Figure 1-9 Graph for SO₂ Emission of Tae Kyi Kone Village

Remark: SO₂ is also exceeding above the guideline due to the limestone mining operation process and vehicle movements. Due to the use of fossil fuel (oil or gas fired power stations) as well as many chemicals, emissions from car and motorcycles where residential area, raw crusher, etc. The result of SO₂ emission is above the NEQG guideline according to the air monitoring result like the previous monitoring result of SO₂ at 2016. Therefore, the following appropriate mitigation measure to control SO₂ emission is required to implement during the operation period.

Mitigation Measure

- ✓ Regular checkups and maintenance on all vehicles with fossil fuel usage are needed.
- ✓ Use fuel oil with low Sulphur (if possible)

- ✓ Use environmentally friendly state of the art instruments and machines (such as engines with higher fuel efficiency, machinery that emit lower noise level), if possible
- ✓ Equip instruments, machines, and vehicles with air pollution control devices to minimize exhaust emissions. (These may not available but should be considered in advanced for the near future)
- ✓ To conserve fuel and to prevent unnecessarily emission of gas (smoke) never let vehicles and instruments left running unnecessarily
- ✓ Avoid open burning of all kind of solid wastes; reuse and recycle them as far as possible and finally dispose them at approved land fill (dump site)
- ✓ Provide adequate PPE (masks, mouth and nose covers) to workers

1.2.2. Noise and Vibration

1.2.2.1. Noise

WHO has described noise pollution as an underestimated threat that can cause hearing loss, cardiovascular problems, cognitive impairment, stress and suffering from depression. Noise pollution can affect people in several ways, some of which includes cardiovascular diseases and sleep disturbances. MONREC (Ministry of Natural Resources and Environmental Conservation) has issued National Environmental Quality (Emission) Guidelines to provide the basis for regulations and control of noise level. Noise impacts should not exceed the levels presented in Table 1-5.

Table 1-5 Noise Level Standard of NEQG Guideline

Receptor	One Hour LAeq (dBA) ^a	
	Daytime 07:00-22:00 (10:00-22:00 for Public Holidays)	Nighttime 22:00 – 07:00 (22:00 – 10:00 for Public Holidays)
Residential, Institutional, educational	55	45
Industrial, commercial	70	70

^a Equivalent continuous sound level in decibels

The noise level measurements were made in the limestone mining operation process and vehicle movements in order to ensure and protect from the hazardous work environment. The data were collected on day and night 25th and 26th January 2022. Noise measurements are needed to make in the worksite and surrounding environment as it helps in identifying work locations where there are noise problems, employees who may be affected, and in checking the compliance with noise regulations, noise control, and community annoyance. It is also important to determine that if noise is a potential problem in the workplace. Equipment that is used to measure ambient noise measurement is as shown below in Figure 1-10. The stations which were made noise measurements are shown in Figure 1-11 and the photo made in the field visit are shown in Figure 1-12.

GM-1356 Digital Sound Level Meter

It is used for measuring noise and other sounds in the project factory.



Figure 1-10 Equipment Used to Measure Noise Levels

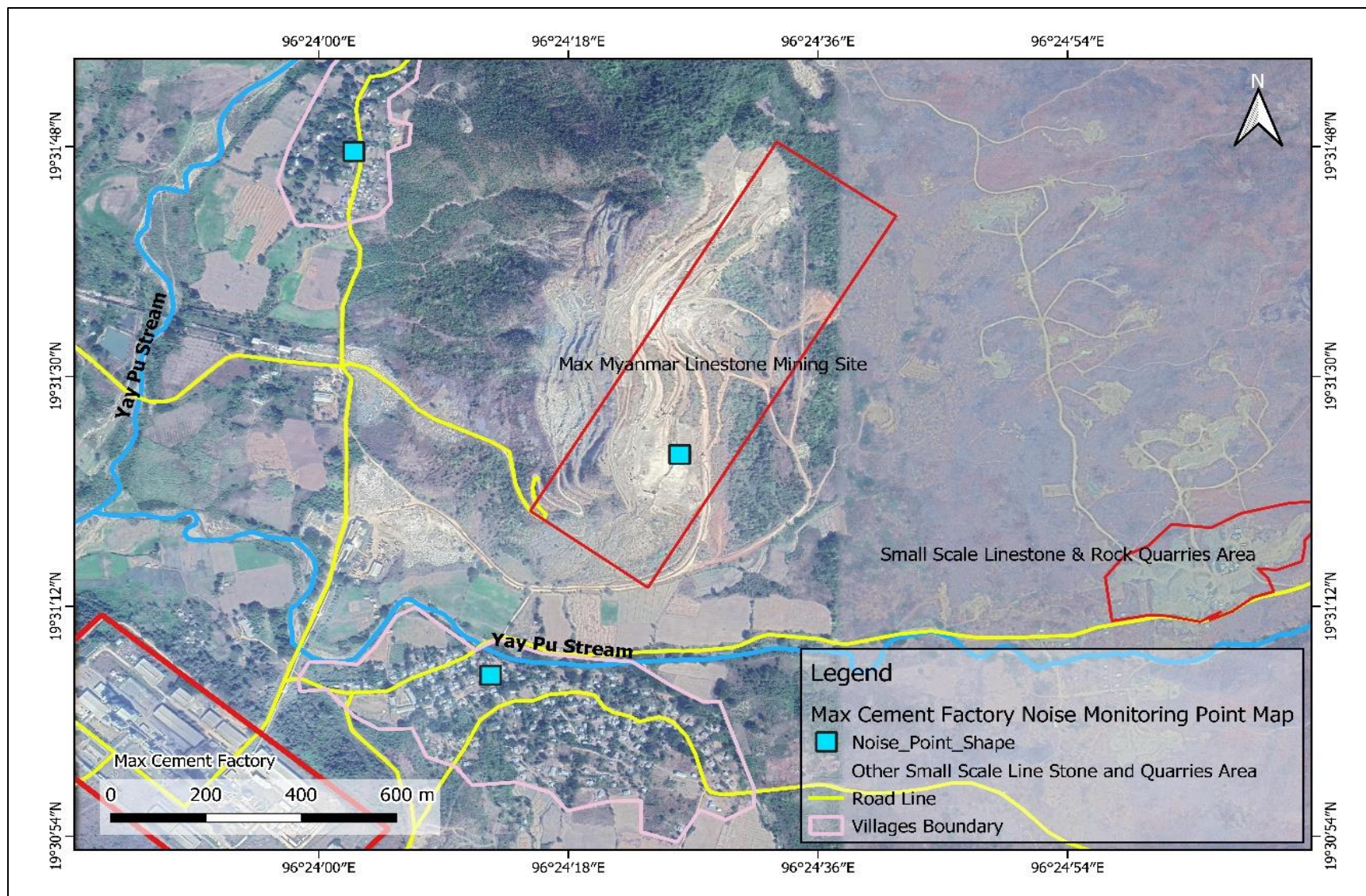


Figure 1-11 Noise Quality Measurement Point



Figure 1-12 Noise Level Measurement in the Mining Site

To know the noise pollution level in the mining site and its vicinity, the noise quality was measured in the mining site, Aung Nan Cho and Tae Kyi Kone villages with BENETECH GM-1356 digital sound level meter and compared with NEQEG/ECD guideline values. The coordinates are the same as mentioned for ambient air earlier.

In measuring noise at the mining site, it is noted that minimum noise level at daytime is 33.08 dBA and at night time is 36.2 dBA. The maximum noise measurement results at the mining site are 86 dBA at daytime and 60.2 dBA at night time. There are heavy activities in the loading/unloading place and raw crushing process. The average noise level at mining site is 65 dBA at daytime and 40.8 dBA at night time. Thus, the average noise measurement results are relevant to the standard noise level.

In measuring noise at Aung Nan Cho village, the average noise level at day time is 65.5 dBA and average noise level at night time is 54.8 dBA. It is exceeding a little bit above the NEQEG guideline values due to the moving of motorcycles and trucks at day time and young people play guitar at night time near the noise measurement. In measuring noise measurement at Tae Kyi Kone village, the average noise result is under the guideline, specifically noise level at day time is 48.3 dBA and average noise level at night time is 43 dBA. The measurement results are in Table 1-6 and Table 1-7 respectively.

The results of the noise quality measurements in the EMP, 2016 are shown in Table 1-8 to compare the current noise results.

Table 1-6 Locations of sound quality measured

Sr	Name	Location (Lat/ Long)
1	Mining Site	N. Lat. 19° 31' 25", E. Long. 96° 24' 26"
2	Aung Nan Cho Village	N. Lat. 19° 31' 5", E. Long. 96° 24' 12"
3	Tae Kyi Kone Village	N. Lat. 19° 31' 48", E. Long. 96° 24' 5"

Table 1-7 Current Monitoring Measurement results of Noise (dBA)

No.	Measurement Place	Current activity during monitoring	Noise Level (dBA)						NEQG ¹ standard		
			Day Time						Residential, Institutional, educational		Industrial, commercial
			Minimum dBA		Maximum dBA		Average dBA				
			Day	Night	Day	Night	Day	Night	Day	Night	
1	At Mining Site	Operation running, Vehicle movement (Day)/ Small scale factory operation	33.08	36.2	86	60.2	65.0	40.8	55	45	
2	At Aung Nan Cho Village	Motorcycle, truck (Day)/ Young people play guitar (Night)	63.9	48.2	64.6	54.8	65.5	54.8	55	45	70
3	At Tae Kyi Kone Village	Motorcycle (Day/Night)	42.9	43.5	49.4	44.7	48.3	43.0	55	45	70

¹National Environmental Quality (Emission) Guidelines, 29 Dec 2016

Table 1-8 Noise Quality measurements result (dBA) in the EMP report (2016)

No.	Parameter	At Mining Site		At Aung Nan Cho		At Tae Kyi Kone		NEQG guideline values	
		Day	Night	Day	Night	Day	Night	Day	Night
1	Noise level (in dBA)	49	37	41	29	44	42	55	45

¹National Environmental Quality (Emission) Guidelines, 29 Dec 2016

Remark: The current average noise results in mining site are higher if compare with the previous noise monitoring results but it is still under the guideline. The reason for these noise results is due to the vehicle movements and operation processes of the Max cement factory and small-scale limestone factory.

1.2.2.2. Vibration

BENETECH vibration meter was used for measuring vibration at the same points for air quality measurement and noise level measurement, specifically at the mining site, Aung Nan Cho village and Tae Kyi Kone village. The current measurement results are 4.5 mm/s at mining site, 2.4 mm/s at Aung Nan Cho village and 1.1mm/s at Tae Kyi Kone village. But vibration due to blasting is instantaneous (very temporary). The results of the vibration measurement in the EMP report, 2016 were 2.3 mm/s at the mining site, 1.8 mm/s at Aung Nan Cho village, and 1.5 mm/s at Tae Kyi Kone village respectively. Thus, the vibration results do not change so much in the current situation. Equipment used for measuring vibration is Figure 1-13. The measurement made in the field visit are shown in Figure 1-14. The location of vibration measurement points map is shown in Figure 1-15.



Figure 1-13 Vibration Meter



Figure 1-14 Vibration measurement at Mining Site

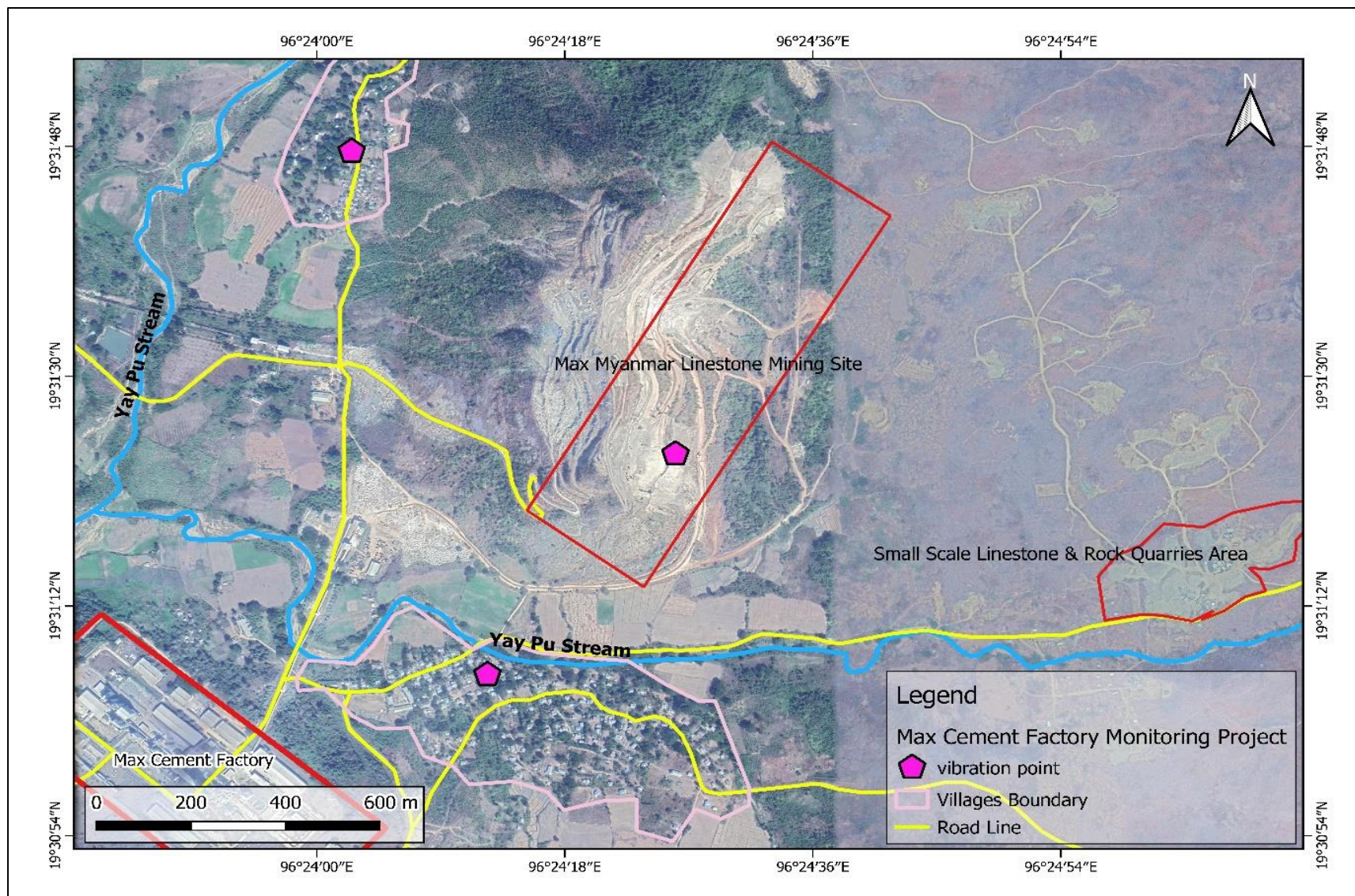


Figure 1-15 Location of vibration measurement points

1.2.3. Water Quality

Water sample was collected in the Yay Pu stream which is Lat. 19° 31' 12.00" N, Long. 96° 24' 5.63" E. As the lime stone mining production process does not produce wastewater, the stream water samples were collected to know the water quality of the mining site environment as shown in Figure 1-16. The process was conducted on 25th and 26th January 2022 then sent to the laboratory. As the result, pH level of water is on the margin of the standard value and the other parameters such as COD, BOD, Total Suspended Solids, Phosphate, Nitrate (N.NO₃) and Oil & Grease are under the guideline. Water sample collection map of Max Myanmar Manufacturing Co., Ltd is shown in Figure 1-17. The results of current water quality and previous water quality are shown in the following Table 1-10 and compared with the guideline value of NEQEG Effluent Guideline values prescribed by ECD, original laboratory test result is attached in **Appendix B**.



Figure 1-16 Water Sample Collection from Yay Pu Stream

Table 1-9 The coordinate of water collection point

Project Name	Water Quality Measurement GPS Location	Date
Max Myanmar Manufacture Limestone Mining Site.	19°31'1.89"N 96° 24'5.65"E	26 th January 2022

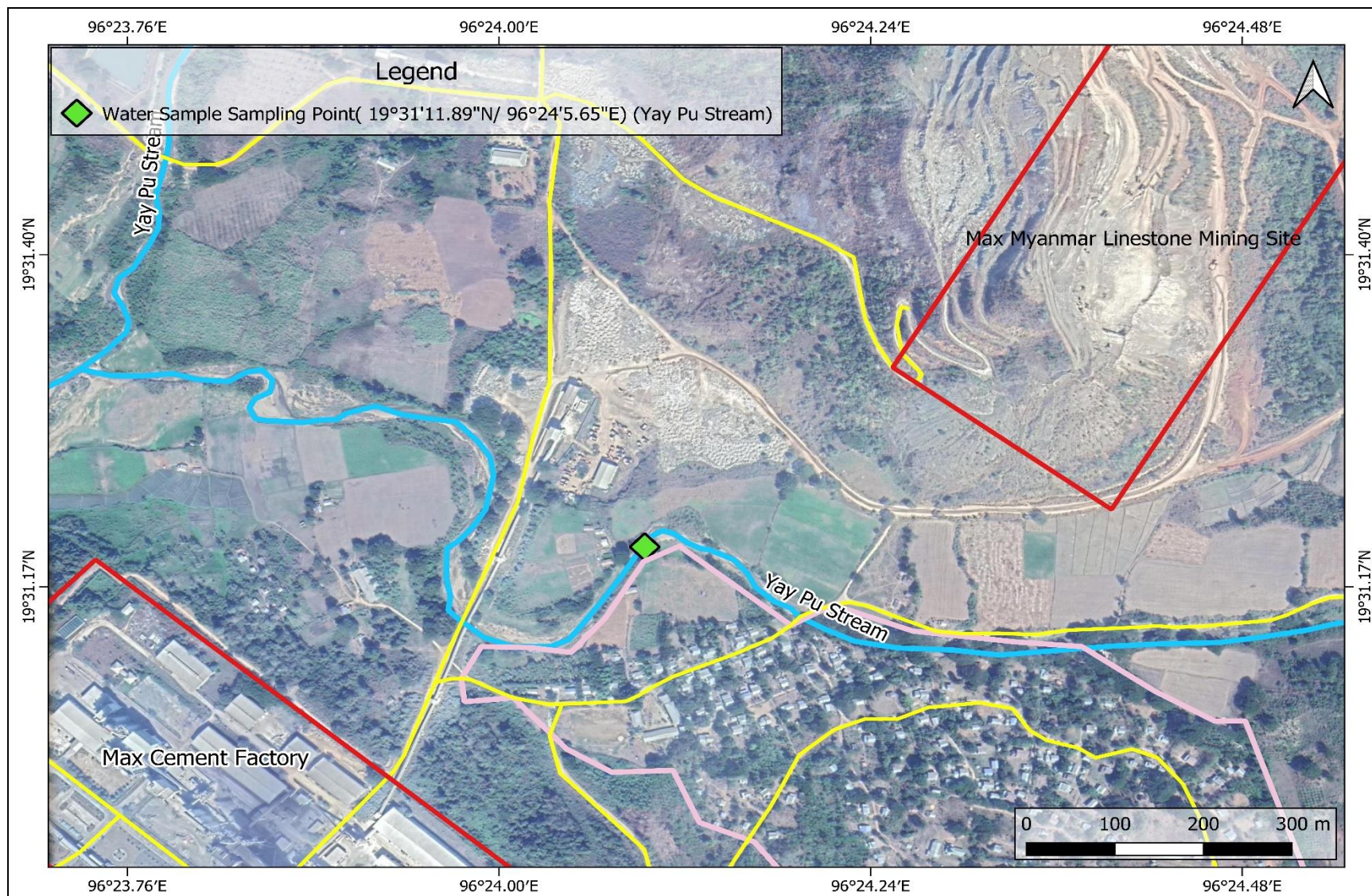


Figure 1-17 Location of Water Sample Collect point

Table 1-10 Current and previous water quality results

No.	Parameter	Current Result	Previous Result	Unit	Method	WHO Guideline Value	Remark
1	PH ¹	6.5	7.9	S. U	pH meters	6.5-8.5 ^c	Normal
2	Total Suspended Solids	0	6	mg/L	Lovibond Spectro Direct Method No. 385	500mg/l	Normal
3	BOD ₅ ⁶	3	6	mg/L	Estimated by Eco-Lab with Jenway Dissolved Oxygen Meter (Model 970)	50mg/l	Under the guideline
4	COD ³	<30	32	mg/L	Lovibond Spectro Direct Method No.130~132	250mg/l	Under the guideline
5	Nitrate ³	0.5	0.3	mg/L	Lovibond Spectro Direct Method No. 265,267	50mg/l	Under the guideline
6	Phosphate ³	0.53	-	mg/L	Lovibond Spectro Direct Method No. 320, 321	-	-
7	Oil & Grease ⁹	2	13.23	mg/L	Hexane Extraction Method	10 mg/l	Under the guideline

*WHO Guideline Value

" - " = No Reference Standard

1.2.4. Soil sample (surface soil)

Soil samples were collected at Aung Nan Cho village and Tae Kyi Kone village (the soil at mining site is sheer limestone rock). The coordinate for the soil sample collecting spots were the same as those for air monitoring places shown in Table 1-11 and it is also the same coordinates with the previous soil sample collecting points. The soil sample were brought back to Yangon and analyzed at Department of Agricultural (Land use) laboratory. The soil sample collecting map is shown in Figure

1-18. The current soil sample results and soil analytical data sheet are shown in Table 1-12 and Table 1-13. The previous soil sample results are also shown in Table 1-14 and Table 1-15 to compare the current soil results.

Table 1-11 **Location of soil sample collecting places**

Sr	Name	Location (Lat / Long)
1	Aung Nan Cho Village	N. Lat. 19° 31' 5", E. Long. 96° 24' 12"
2	Tae Kyi Kone Village	N. Lat. 19° 31' 48", E. Long. 96° 24' 5"

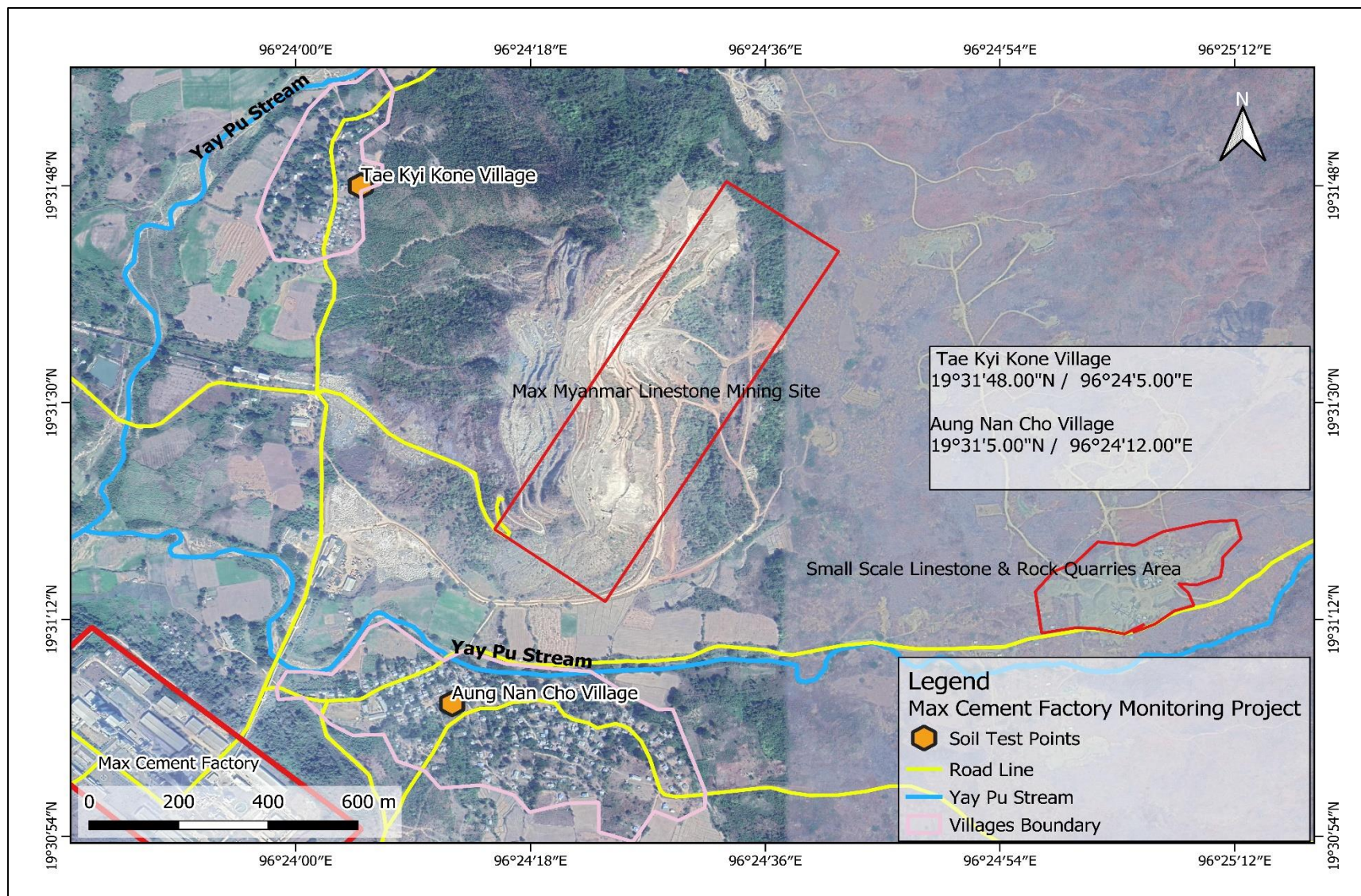


Figure 1-18 Location of soil sample collect point

Table 1-12 Current soil test results

Sr. No	Sample	PH	Texture	Total N	Available Nutrients
					p
1	Aung Nan Cho Village	Slightly Acid	Sandy Loam	Low	Low
2	Tae Kyi Kone Village	Slightly Alkaline	Sandy Loam	Low	High

Table 1-13 Current soil analytical data sheet

Sr No.	Sample	Moisture %	pH Soil; Water 1:2.5	Texture				Total N %	Available Nutrients
				Sand %	Silt %	Clay %	Total %		P (ppm)
1	Aung Nan Cho Village	3.02	6.49	68.22	19.78	12.0	100	0.14	5.36(B)
2	Tae Kyi Kone Village	4.44	7.52	58.42	29.88	11.70	100	0.17	19.27 (o)

B = Bray & Kurtz Method

O = Olsen Method

Table 1-14 Soil test results in the EMP report (2016)

Sr. No	Sample	PH	Texture	Total N	Available Nutrients
					p
1	Aung Nan Cho Village	Slightly Alkaline	Sandy Clay Loam	Low	High
2	Tae Kyi Kone Village	Slightly Alkaline	Clay Loam	Very Low	Medium

Table 1-15 Soil test results in the EMP report (2016)

Sr No.	Sample	Moisture %	pH Soil; Water 1:2.5	Texture				Total N %	Available Nutrients
				Sand %	Silt %	Clay %	Total %		P (ppm)
1	Aung Nan Cho Village	3.02	6.49	68.22	19.78	12.0	100	0.14	5.36(B)
2	Tae Kyi Kone Village	4.44	7.52	58.42	29.88	11.70	100	0.17	19.27 (o)

1.2.5. Waste

The improper management and lack of disposal technique of the waste pollutes to the environment. It affects the water bodies. It also changes the physical, chemical, and biological properties of the water bodies. There are top soil generated in the production process but it generates small amount. In addition, domestic wastes generate such as leftovers, plastic bottles, tissues, wastes from kitchen and sanitary pads etc. The domestic waste generation measurement was conducted at staff accommodation and office to know generation rate per person/day. The number of staff live in staff accommodation are 35 people and the number of staff work in office are 28 people.

The average domestic waste generation results are 0.01 kg per person/day in office and 0.03 kg per person/day in staff accommodation respectively. Moreover, domestic wastes are disposed to the disposal site inside the project area one time per day and leftovers from workers' food are used as animal foods. The domestic waste generation measurement photo is shown in Figure 1-19 and the domestic waste measurement result graphs are shown in Figure 1-20 and Figure 1-21.



Figure 1-19 Solid waste generation measurement photo

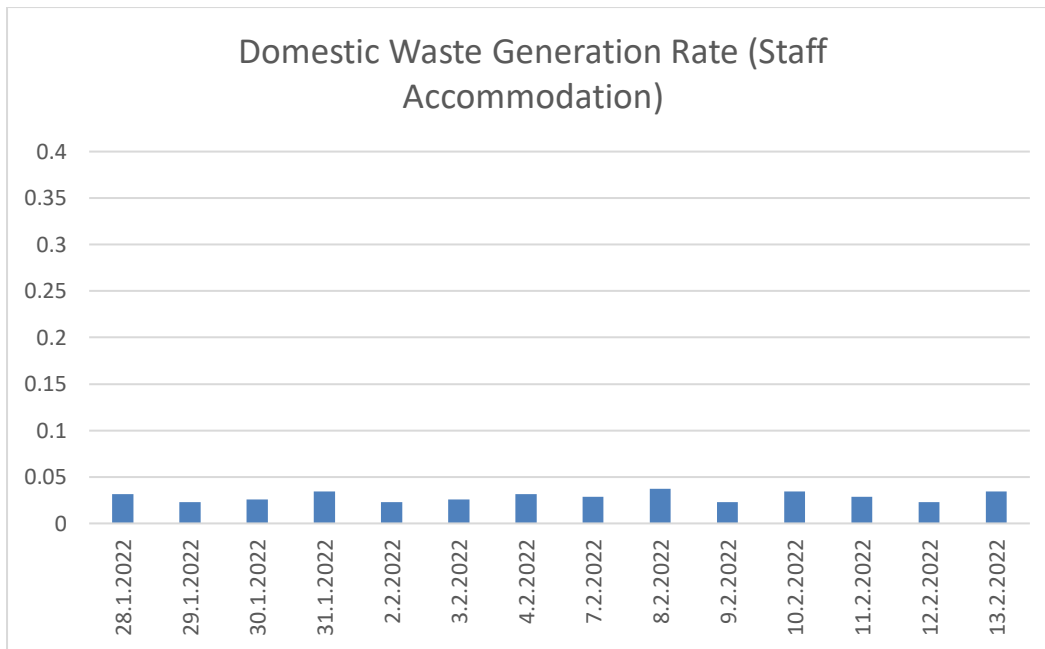


Figure 1-20 Domestic Waste measurement results graph (Staff Accommodation)

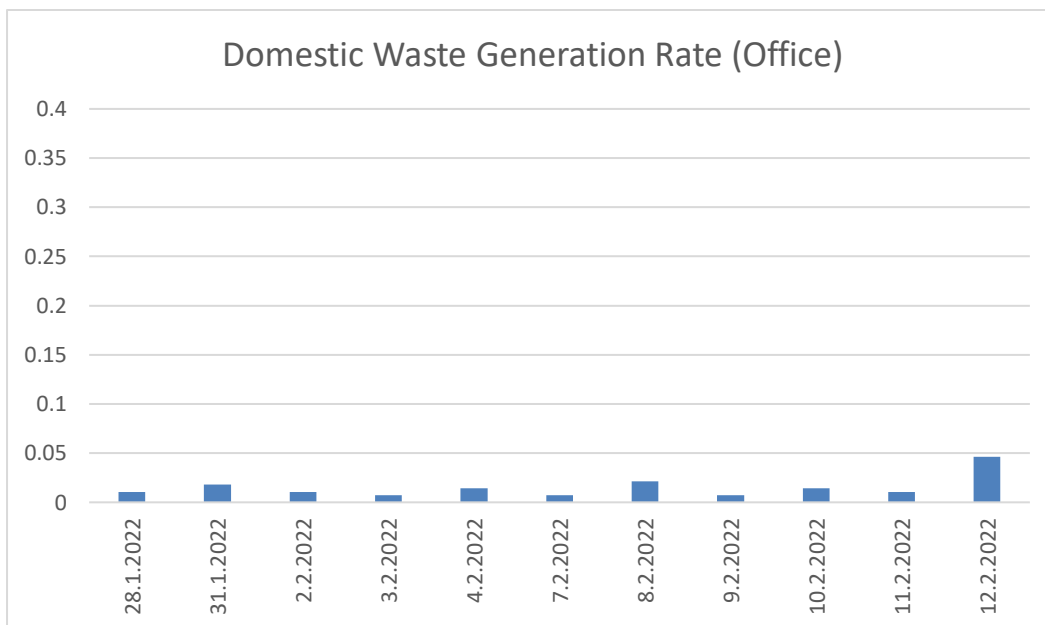


Figure 1-21 Domestic Waste measurement results graph (Office)

Remark: The current average waste measurement rates in staff accommodation and office are low. The reason for these rates is due to the food wastes are used as animal food.

APPENDIX A
Outdoor Air Monitoring Result
and
Outdoor Air Monitoring Devices EPAS-HAZ Scanner



HEXAGONAL ANGLE
INTERNATIONAL CONSULTANTS CO.,LTD.

Office: No. 233/2, First Floor, Daung Min Street, 14/3 Quarter, South Okkalapa Township, Yangon, Myanmar.
Tel: +959 898333722
Email: info@hexagonalangle.com
Website: www.hexagonalangle.com

Max Cement Limestone Mining Site (Outdoor Air Quality Analyzed Result)

Sr	Parameter	Existing Values			NEQEG*/WHO Guideline Value µg/m3
		At Mining Site	At Aung Nan Cho Village	At Tae Kyi Kone Village	
1	CH ₄ (ppm)	26857.2	26718.8	26218.9	NG
2	PM ₁₀ (ug/m ³) (24-hour)	58.9	63.8	66.8	50 (Above the guide line)
3	CO (ug/m ³) (8-hour)	0.0	0.1	0.1	30000 ppb (Under the Guideline)
4	CO ₂ (ppb) (8 hour)	0.0	0.0	0.0	(Under the Guideline)
5	HC (ppb)	450.3	367.9	388.1	NG
6	H ₂ S (ppb)	0.0	0.0	0.0	NG
7	NO ₂ (ug/m ³) 40 (1-Year) 200 (1-hour)	5.8	8.5	27.1	(Under the guide line)
8	O ₂	0.0	0.0	0.0	NG
9	SO ₂ (ug/m ³) (24-hour) 20 (24-hr) 500 (10-minute)	59.5	26.8	71.7	(Above the guide line)

*National Environmental Quality (Emission) Guideline 2015

NG=No Guideline

Analyzed by

Win Naing Oo

Coordination officer and survey specialist
Hexagonal Angle International Consultants Co., Ltd.

Checked by

Ei Ei Zaw

General Manager (Environmental & Social Specialist)
Hexagonal Angle International Consultants Co., Ltd.

DEVELOPING ALLIANCE, DELIVERING SUCCESS!

Certificate of Calibration

Certificate Number: EDCQP200-4.11.5

Environmental Devices Corporation certifies the Haz-Scanner model EPAS is calibrated to published specifications and NIST traceable.

Calibration Dust Specifications are NIST traceable using Coulter Mutisizer II c. ISO12103 -1 A2 Fine Test Dust and is designed to agree with EPA Class I and Class III FRM and FEM particulate samplers and monitors and EN 12341 and EN 14907 standards.

Gas sensors are Calibrated against NIST/EPA traceable Calibration Gas using NIST primary Flow Standard: LFE774300 to ISO 17025 and EPA Instrumental Test Methods as defined by 40 CFR Part 60.

Quality system standard to meet the requirements of ANSI/ASQC standard Q9000-1994 (ISO 9001), MIL-STD 45662A, and customer's specification if required.

Temperature = 22°C

Relative Humidity = 30%

Atmospheric Pressure = 760 mmHg

Measurement Uncertainty Estimated @ 95% Confidence Level (k=2) using ISO 17025 guidelines.

Model	Serial Number	Calibration Date	Next Calibration Due
EPAS	919243	February 18, 2021	February 2022

Calibration Span Accessory if purchased	Sensor A K=	Sensor B K=	Model :
--	----------------	----------------	---------

Technician	Supervisor
Dan Okuniewicz <i>De</i>	Mark Sullivan <i>ms</i>

Environmental Devices Corporation
4 Wilder Drive Building #15
Plaistow, NH 03865
ISO-9001 Certified

APPENDIX B
Laboratory Water Result



ALARM Ecological Laboratory

Water Testing Result Report



Report Number: EL-WR-22-00051

Date: February 4, 2022

Client Information

Client Name : Max Cement Factory, Naypyitaw
Organization : -
Client ID : -
Registration Date & Time : 27.1.2022
Contact : 09898333711
Testing Purpose : Monitoring

Sample Information

Sample ID : 7627
Sample Name : Surface Water
Sample Type / Source : Raw
Sampling Date & Time : 26.1.2022
Sample Location : Yay Pu Stream, Taung Philar
Limestone Deposit,
Lewei Tsp, Naypyitaw
Latitude : N 19° 31' 12"
Longitude : E 96° 24' 5.63"

Testing Results

*This laboratory analysis report is based solely on the sample submitted by the client unless client took our sampling service.
This report shall not be reproduced except in full, without written approval of the laboratory*

Sr.	Quality Parameters	Results	Units	Drinking Standards	Remarks
1	pH ¹	6.5	S.U	6.5 – 8.5 ^c	Normal
2	TSS ³	0	mg/L	≤1000 ^c	Normal
3	BOD ₅ ⁶	3	mg/L	-	-
4	COD ³	< 30	mg/L	-	-
5	Nitrate ³	0.5	mg/L	<50 ^c	-
6	Phosphate ³	0.53	mg/L	-	-
7	Oil & Grease ⁹	2	mg/L	-	-


"ND" = Not Detected

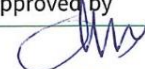
"LOD" = Lower limit of detection

" - " = No Reference Standard

Tested by

Approved by


Daw Lin Myat Myat Aung
Lab. Technician I
Ecological Laboratory
ALARM


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

531 (D), MarlarMyaingYeik Thar Street, Kamayut Tsp., Yangon, Myanmar Tel: 01-503301, 01-503302, 09-407496078

Email: aelab@alarmmyanmar.org , websites: www.alarmmyanmar.org

APPENDIX C
Department of Agriculture (Land use)
Soil Interpretation of Results
Soil Analytical Data Sheet

ပြည်ထောင်စုသမ္မတမြန်မာနိုင်ငံတော်အစိုးရ
စိုက်ပျိုးရေး၊ မွေးမြူရေးနှင့် ဆည်မြောင်းဝန်ကြီးဌာန
စိုက်ပျိုးရေးဦးစီးဌာန
(မြေအသုံးချရေးဌာနခွဲ)
ရန်ကုန်မြို့

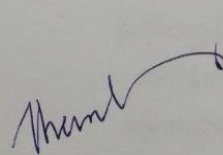
စာအမှတ်- ခခ- ၂(၁) / ၂၀၂၁-၂၀၂၂ (၀၁)

နေ့စွဲ၊ ၂၀၂၂ ခုနှစ်၊ ဖေဖော်ဝါရီလ (၇) ရက်

အကြောင်းအရာ။ မြေနမူနာ ဓာတ်ခွဲအဖြေများပေးပို့ခြင်း။

ရည်ညွှန်းချက်။ **Max Myanmar Manufacturing Co., Ltd မှ (27.1.2022)နေ့တွင်**
ပေးပို့သော နမူနာ။

အထက်အကြောင်းအရာပါ ကိစ္စနှင့်ပတ်သက်၍ ရည်ညွှန်းစာဖြင့် ပေးပို့
လာသော မြေနမူနာ (၂ - မျိုး) အား ဓာတ်ခွဲစစ်ဆေးပြီးဖြစ်၍ ဓာတ်ခွဲတွေ့ရှိချက်
အဖြေများကို ဤစာနှင့် အတူ ပူးတွဲပေးပို့ပါသည်။



(ဒေါက်တာသန္တာညီ)

ဒုတိယညွှန်ကြားရေးမှူး

ဓာတ်ခွဲခန်းတာဝန်ခံ

မြေအသုံးချရေးဌာနခွဲ

၁

Max Myanmar Manufacturing Co., Ltd

DEPARTMENT OF AGRICULTURE (LAND USE)

SOIL INTERPRETATION OF RESULTS

Max Myanmar Manufacturing Co., Ltd (27.1.2022)

Division - နေပြည်တော်

Sheet No. 1

Township - လယ်ဝေးမြို့နယ်

Sr No. S 1-2 /2022

Sr No.	Sample	pH	Texture	Total N	Available Nutrients
					P
1	Aung Nan Cho Village	Slightly Acid	Sandy Loam	Low	Low
2	Tae Kyi Kone Village	Slightly Alkaline	Sandy Loam	Low	High

(ဒေါက်တာသန္တာညီ)
ဒုတိယညွှန်ကြားရေးမှူး
ဓာတ်ခွဲခန်းတာဝန်ခံ
မြေအသုံးချရေးဌာနခွဲ

DEPARTMENT OF AGRICULTURE (LAND USE)

SOIL ANALYTICAL DATA SHEET

Max Myanmar Manufacturing Co., Ltd (27.1.2022)

Division - နေပြည်တော်
Township - လယ်ဝေးမြို့နယ်

Sheet No. 1

Sr No. S 1-2 /2022

Sr No.	Sample	Moisture %	pH Soil:Water 1:2.5	Texture				Total N %	Available Nutrients
				Sand %	Silt %	Clay %	Total %		P (ppm)
1	Aung Nan Cho Village	3.02	6.49	68.22	19.78	12.00	100	0.14	5.36 (B)
2	Tae Kyi Kone Village	4.44	7.52	58.42	29.88	11.70	100	0.17	19.27 (O)

B = Bray & Kurtz Method

O= Olsen Method

Mam
(ဒေါက်တာသန္တာညီ)
ဒုတိယညွှန်ကြားရေးမှူး
ဓာတ်ခွဲခန်းတာဝန်ခံ
မြေအသုံးချရေးဌာနခွဲ

APPENDIX D
Solid Waste Generation Measurement Result

အမှိုက်စွန့်ပစ်မှုမှတ်တမ်း

(ရုံး)

စဉ်	နေ့စွဲ	အမှိုက် အမျိုးအစား	ပမာဏ	အကြိမ် အရေအတွက်	သယ်ယူပို့ဆောင် သည့်ယာဉ်	စွန့်ပစ်သည့် နေရာ	ပို့ဆောင်သူ အမည်	လက်မှတ်
၁	၂၈.၁.၂၂	အခြောက်	0.3 kg	၁	M - 39	အမှိုက်ကျင်း	ကျော်ရဲအောင်	
၂	၃၁.၁.၂၂	အခြောက်	0.5 kg	၁	M - 39	အမှိုက်ကျင်း	ကျော်ရဲအောင်	
၃	၂.၂.၂၂	အခြောက်	0.3 kg	၁	M - 39	အမှိုက်ကျင်း	သိန်းဝင်းအောင်	
၄	၃.၂.၂၂	အခြောက်	0.2 kg	၁	M - 39	အမှိုက်ကျင်း	သိန်းဝင်းအောင်	
၅	၄.၂.၂၂	အခြောက်	0.4 kg	၁	M - 39	အမှိုက်ကျင်း	ကျော်ရဲအောင်	
၆	၇.၂.၂၂	အခြောက်	0.2 kg	၁	M - 39	အမှိုက်ကျင်း	ကျော်ရဲအောင်	
၇	၈.၂.၂၂	အခြောက်	0.6 kg	၁	M - 39	အမှိုက်ကျင်း	ကျော်ရဲအောင်	
၈	၉.၂.၂၂	အခြောက်	0.2 kg	၁	M - 39	အမှိုက်ကျင်း	ကျော်ရဲအောင်	
၉	၁၀.၂.၂၂	အခြောက်	0.4 kg	၁	M - 39	အမှိုက်ကျင်း	ကျော်ရဲအောင်	
၁၀	၁၁.၂.၂၂	အခြောက်	0.3 kg	၁	M - 39	အမှိုက်ကျင်း	ကျော်ရဲအောင်	
၁၁	၁၂.၂.၂၂	အခြောက်	1.3 kg	၁	M - 39	အမှိုက်ကျင်း	ကျော်ရဲအောင်	

အမှိုက်စွန့်ပစ်မှုမှတ်တမ်း

(ဝန်ထမ်းအိမ်သာ)

စဉ်	နေ့စွဲ	အမှိုက် အမျိုးအစား	ပမာဏ	အကြိမ် အရေအတွက်	သယ်ယူပို့ဆောင် သည့်ယာဉ်	စွန့်ပစ်သည့် နေရာ	ပို့ဆောင်သူ အမည်	လက်မှတ်
၁	၂၈.၁.၂၂	အခြောက်	1.1 kg	၁	M - 39	အမှိုက်ကျင်း	ကျော်ရဲအောင်	
၂	၂၉.၁.၂၂	အခြောက်	0.8 kg	၁	M - 39	အမှိုက်ကျင်း	ကျော်ရဲအောင်	
၃	၃၀.၁.၂၂	အခြောက်	0.9 kg	၁	M - 39	အမှိုက်ကျင်း	ကျော်ရဲအောင်	
၄	၃၁.၁.၂၂	အခြောက်	1.2 kg	၁	M - 39	အမှိုက်ကျင်း	ကျော်ရဲအောင်	
၅	၂.၂.၂၂	အခြောက်	0.8 kg	၁	M - 39	အမှိုက်ကျင်း	သိန်းဝင်းအောင်	
၆	၃.၂.၂၂	အခြောက်	0.9 kg	၁	M - 39	အမှိုက်ကျင်း	သိန်းဝင်းအောင်	
၇	၄.၂.၂၂	အခြောက်	1.1 kg	၁	M - 39	အမှိုက်ကျင်း	ကျော်ရဲအောင်	
၈	၇.၂.၂၂	အခြောက်	1 kg	၁	M - 39	အမှိုက်ကျင်း	ကျော်ရဲအောင်	
၉	၈.၂.၂၂	အခြောက်	1.3 kg	၁	M - 39	အမှိုက်ကျင်း	ကျော်ရဲအောင်	
၁၀	၉.၂.၂၂	အခြောက်	0.8 kg	၁	M - 39	အမှိုက်ကျင်း	ကျော်ရဲအောင်	
၁၁	၁၀.၂.၂၂	အခြောက်	1.2 kg	၁	M - 39	အမှိုက်ကျင်း	ကျော်ရဲအောင်	
၁၂	၁၁.၂.၂၂	အခြောက်	1 kg	၁	M - 39	အမှိုက်ကျင်း	ကျော်ရဲအောင်	
၁၃	၁၂.၂.၂၂	အခြောက်	0.8 kg	၁	M - 39	အမှိုက်ကျင်း	ကျော်ရဲအောင်	
၁၄	၁၃.၂.၂၂	အခြောက်	1.2 kg	၁	M - 39	အမှိုက်ကျင်း	သိန်းဝင်းအောင်	