Sembcorp Myingyan Power Company Limited
Registration No. 103598974
Myanmar Centre Tower 1, 20th Floor, Unit 01/03
192 Kaba Aye Pagoda Road,
Bahan Township, Yangon, Myanmar
Tel: (95) 1-9345233 Fax: (95) 1-9345229
www.sembcorp.com

Our Ref: SMPC/MM/2020-065

09 September 2020

To:

Director General
Department of Environmental Conservation
Ministry of Natural Resources and Environmental Conservation
Office Building No. (53)
Nay Pyi Taw, Myanmar

SUBJECT: MYINGYAN IPP – Submission of Environmental Management Plan and Greenhouse Gas Report

Dear Sir,

1. On 23 April 2015, Sembcorp Utilities Pte. Ltd. ("**Sembcorp**"), a wholly owned subsidiary of Sembcorp Industries Limited, an energy, water and marine group listed on the main board of the Singapore Exchange, was awarded a Notice of Award by the then Myanma Electric Power Enterprise ("**MEPE**"), a division under the Ministry of Electricity and Energy ("**MOEE**") (formerly known as Ministry of Electric Power) to develop and operate a 225-megawatt gas-fired power plant in central Myanmar under a 22-year power purchase agreement ("**Project**").

2. A Power Purchase Agreement (the "**PPA**") was signed on 29 March 2016 between the then MEPE and Sembcorp Myingyan Power Company Limited (the "**Company**"); the Company notes that Electric Power Generation Enterprise ("**EPGE**") has assumed all rights and contractual obligations of the then MEPE, including the PPA.

3. The Project is funded by multilateral development banks such as International Finance Corporation ("**IFC**") and Asian Development Bank ("**ADB**"), as well as several international commercial lenders and as such, an **Environmental and Social Impact Assessment ("ESIA")** was submitted in order to achieve **Environmental Compliance Certificate (ECC).**

4. In accordance with Clause 4 of the Approval Letter on ESIA Report released from Ministry of Natural Resources and Environmental Conservation (MONREC) dated 17th March 2017, we are pleased to submit Greenhouse Gas (GHG) Report in the form of our Air Quality Monitoring Report and Water Quality Monitoring Report. In accordance the Environmental Impact

Sembcorp Myingyan Power Company Limited
Registration No. 103598974
Myanmar Centre Tower 1, 20th Floor, Unit 01/03
192 Kaba Aye Pagoda Road,
Bahan Township, Yangon, Myanmar
Tel: (95) 1-9345233 Fax: (95) 1-9345229
www.sembcorp.com

Assessment Procedure issued by MONREC Clause 108, this data is taken on a 6-monthly interval and the attached report contains data for the second half of 2019 and the first half of 2020.

5. Should you have any queries, please do not hesitate to contact Mr Jeremy Toh at jeremy.toh@sembcorp.com. If you require any assistance from us, please do let us know. Thank you for your continued support on this matter.

Yours sincerely,

Jeremy Toh
Managing Director

Enclosed:
1. Air Quality Monitoring Report
2. Water Quality Monitoring Report

Sembcorp Myingyan Power Co., Ltd.

Environmental Monitoring Report

(Air Quality Monitoring)

Prepared by

01 October 2019

E Guard Environmental Services

Table of Contents

List of Figures

List of Tables

1. INTRODUCTION

This report is environmental monitoring (only air and noise quality monitoring) for Sembcorp Myingyan Power Plant which is located beside of Myingyan – Nyaung-Oo Road, near the Sa Ka village in Mandalay Region.

2. METHODOLOGY

Baseline environmental parameters and sampling locations were defined according to the objectives for environmental monitoring purposes. Locations for sampling and analysis of ambient air quality of the project site were identified by Sembcorp Myingyan Power Co,ltd.

2.1 Ambient Air Quality

The emissions of dust particles and gases were measured for 24hrs continuously at the selected sites by using the Environmental Perimeter Air Station (EPAS), and EPAS provides direct readings in real time with data-logging capabilities. The monitoring results were compared with National Environmental Quality (Emission) Guideline (NEQG), World Health Organization (WHO) and American Conference of Governmental Industrial Hygienists (ACGIH) guidelines.

Table 2. 1 Ambient Air Quality Parameters

Ambient Air Quality (4 locations)	
Gas Emission	CO, CO_2, SO_2, NO_2
Dust Emission	PM_{10}, $PM_{2.5}$

Table 2. 2 Air Quality Guideline Values

Parameters	Guidelines Value	Unit	Organization	Averaging Period
PM_{10}	50	$\mu g/m^3$	NEQ	24hrs
$PM_{2.5}$	25	$\mu g/m^3$	NEQ	24hrs
CO	9	ppm	NAAQS	8hrs
CO_2	5000	ppm	ACGIH	8hrs
SO_2	20	$\mu g/m^3$	NEQ	24hrs
NO_2	200	$\mu g/m^3$	NEQ	24hrs

Source: Myanmar National Environmental Quality (Emission) Guidelines, December 2015 & Air quality guidelines global update. 2005. World Health Organization.

2.2 Ambient Noise

Noise level LAeq (dBA) will be measured at the selected locations that can reflect the exposure of the nearest local community and sensitive locations. Duration and frequency were measured for 24hrs continuously at the selected site using the Noise Meter.

The monitoring procedures, data analysis and interpretation were carried out in accordance with the instrument's manufacture and National Environmental Quality (Emission) Guidelines, World Health Organization (WHO) and International Finance Corporation (IFC guidelines in order to be in line with Environmental Conservation Department, Ministry of Natural

Resources and Environment Conservation (MONREC). "National Environmental Quality (Emission) Guidelines" for Myanmar was also presented the value of noise level as LAeq (dBA).

Table 2. 3 Noise level monitoring

Noise monitoring (2 locations)	
Noise Emission	LAeq (dBA) (1hrs, 24 hrs.)

Equipment used to measure ambient air and noise measurement are shown below (**Table 2. 4**)

Table 2. 4 Equipment used to measure ambient air and noise measurement

Davis Vantage Pro2 Wireless Weather Station Provides detailed current weather conditions and expanded forecasts - all at a glance! The Vantage Pro2 uses a frequency-hopping spread spectrum radio from 902 MHz to 928 MHz to transmit and receive data up to 1,000' (300m) line of sight. In addition, the weather station features a bubble level, improved anemometer base, redesigned wind cups, and factory-calibrated wind direction. The integrated sensor suite combines temperature and humidity sensors, rain collector with an aluminum-plated tipping bucket, and anemometer into one package for easy setup. Measure inside and outside temperature and humidity, heat index, barometric pressure, dew point, rainfall, wind direction and speed, and wind chill.	
Haz-Scanner EPAS PM_{10}, PM $_{2.5}$, NO_2, SO_2, CO, CO_2, Temperature, and Relative Humidity	
Digital Sound Level Meter Noise and Vibration	

3. MONITORING LOCATIONS

Locations of sampling sites were identified by Sembcorp Myingyan Power Co,ltd. Air quality was monitored at the four selected locations that are Sa Ka Village (ASR4), Hnan Ywa Village (ASR3), Gyoke Pin Village (ASR 5) and Nyaung Kan Village (ASR 14).

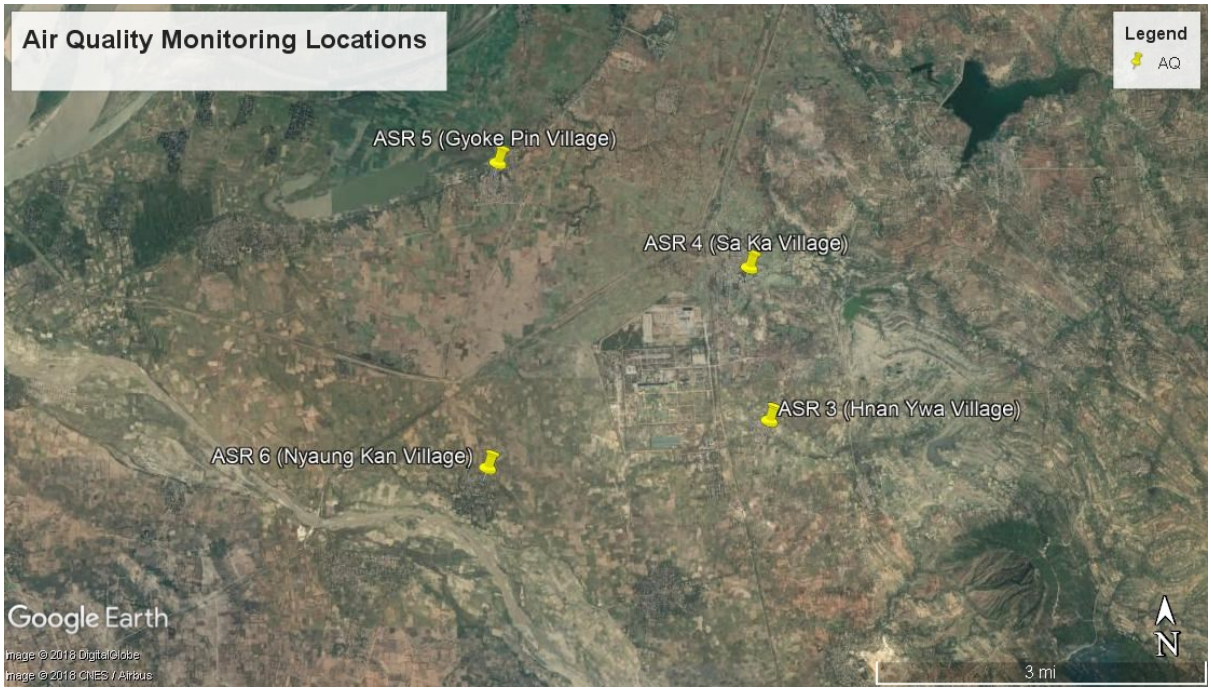

Figure 3. 1 Location of Monitoring Points

Table 3. 1 Location of Monitoring Points

Locations No.	Points	Coordinate	Locations
Ambient Air Quality and Noise Monitoring Locations			
1	ASR4	Lat- 21°23’48.662”, Long- 95°23’1.131”	Sa Ka Village
2	ASR3	Lat- 21°22’17.407”, Long- 95°23’18.450”	Hnan Ywa Village
3	ASR5	Lat- 21°24’21.888”, Long- 95°21’7.381”	Gyoke Pin Village
4	ASR14	Lat- 21°21’58.342”, Long- 95°20’51.254”	Nyaung Kan Village

4. ENVIRONMENTAL QUALITY MONITORING RESULTS

4.1 Ambient Air Quality Monitoring Results

24 hours air quality monitoring were done at each selected location from 10 September 2019 to 14 September 2019. The measured results are compared with national emission guidelines. Based on the results of air quality monitoring, most of the parameters are within the guidelines.

Table 4. 1 Observed Ambient Air Quality Results from Selected Points

Parameters	Observed Value				Guidelines Value	Unit	Averaging Period
	ASR4	ASR3	ASR5	ASR14			
PM_{10}	10.30	3.63	7.37	10.44	50	$\mu g/m^3$	24hrs
$PM_{2.5}$	4.99	1.93	3.03	3.78	25	$\mu g/m^3$	24hrs
CO	0.01	0.00	0.00	0.00	9	ppm	8hrs
CO_2	372.31	322.96	299.19	324.60	5000	ppm	8hrs
SO_2	0.08	0.00	0.00	0.00	20	$\mu g/m^3$	24hrs
NO_2	4.84	3.76	3.76	10.61	200	$\mu g/m^3$	1hrs

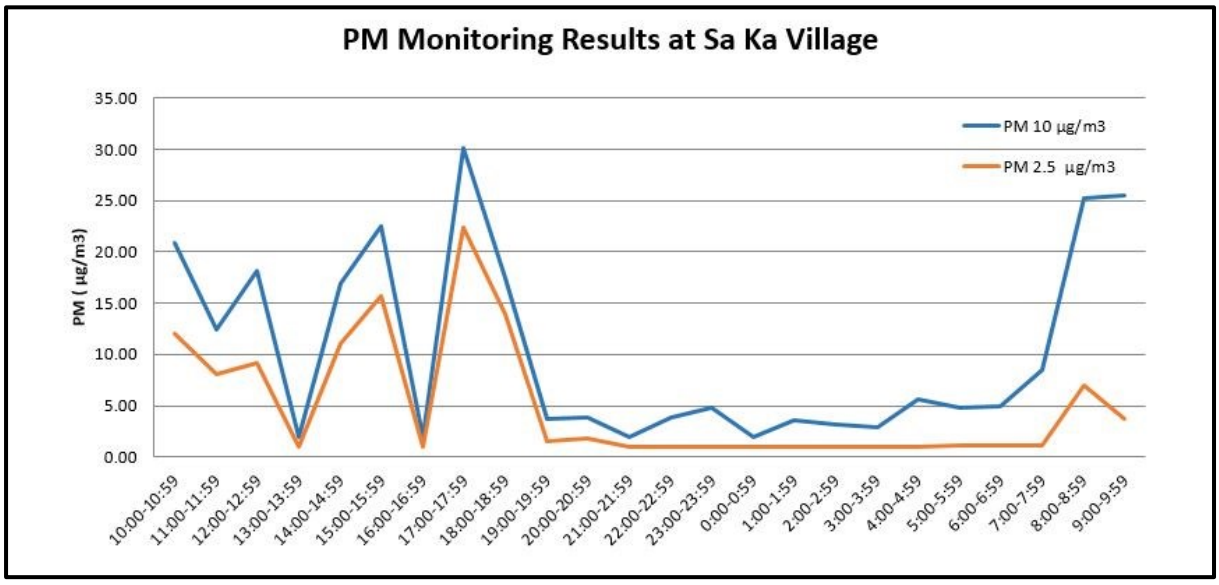

Figure 4. 1 PM Monitoring Results at Sa Ka Village

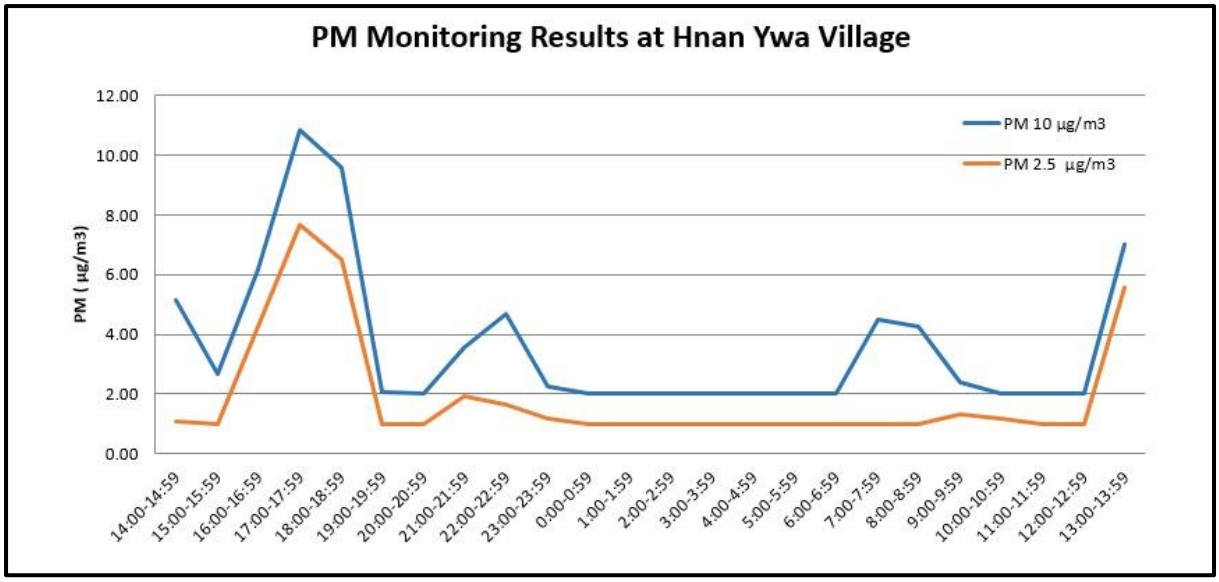

Figure 4. 2 PM Monitoring Results at Hnan Ywa Village

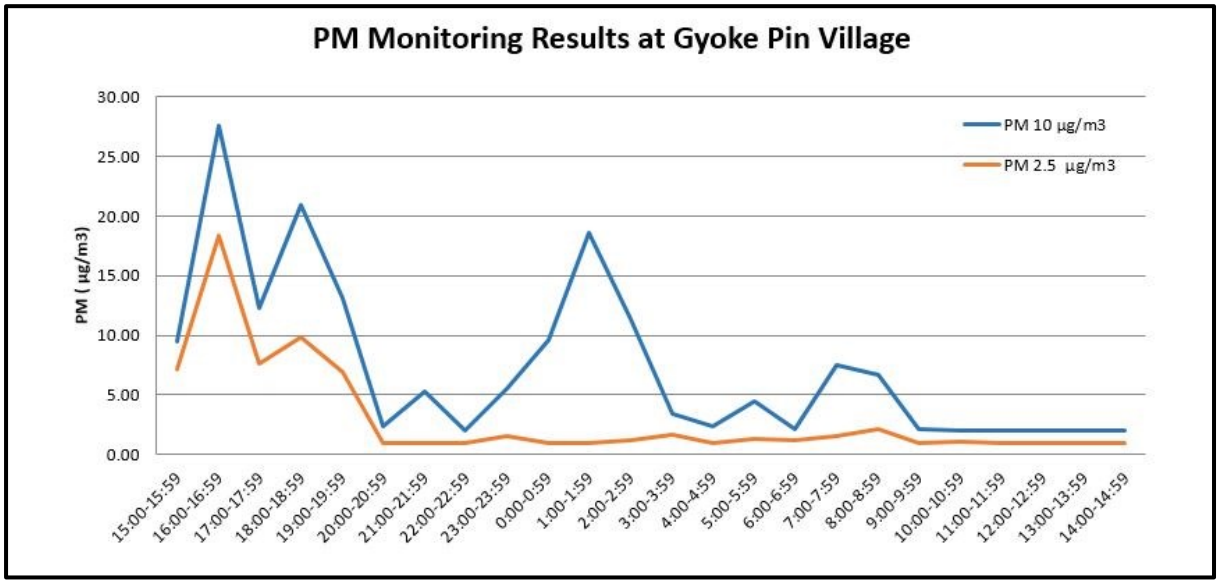

Figure 4. 3 PM Monitoring Results at Gyoke Pin Village

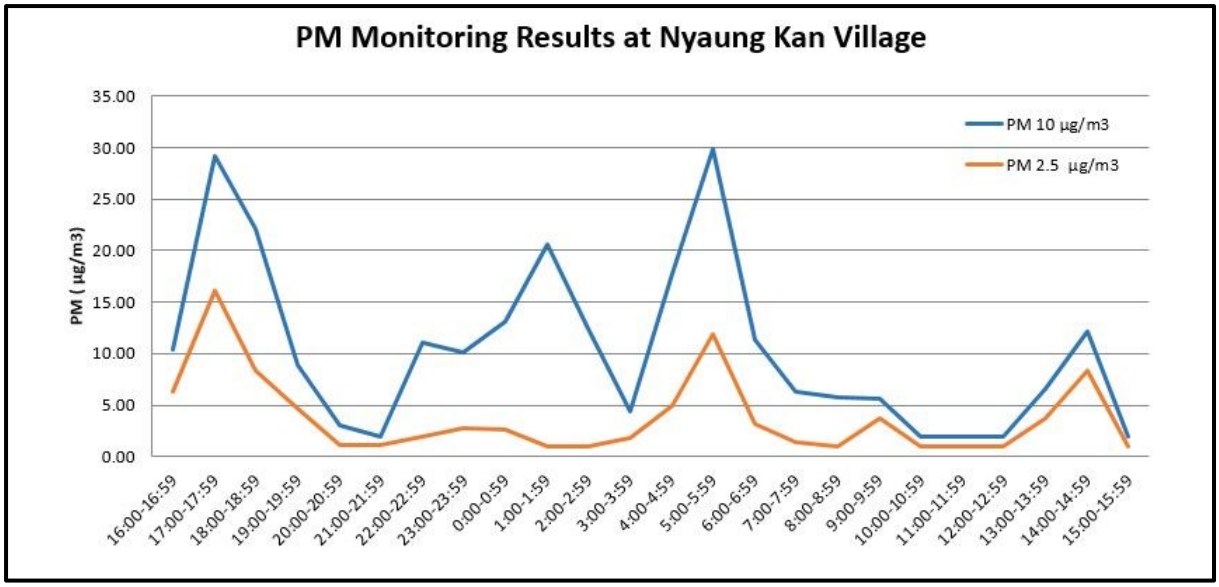

Figure 4. 4 PM Monitoring Results at Nyaung Kan Village

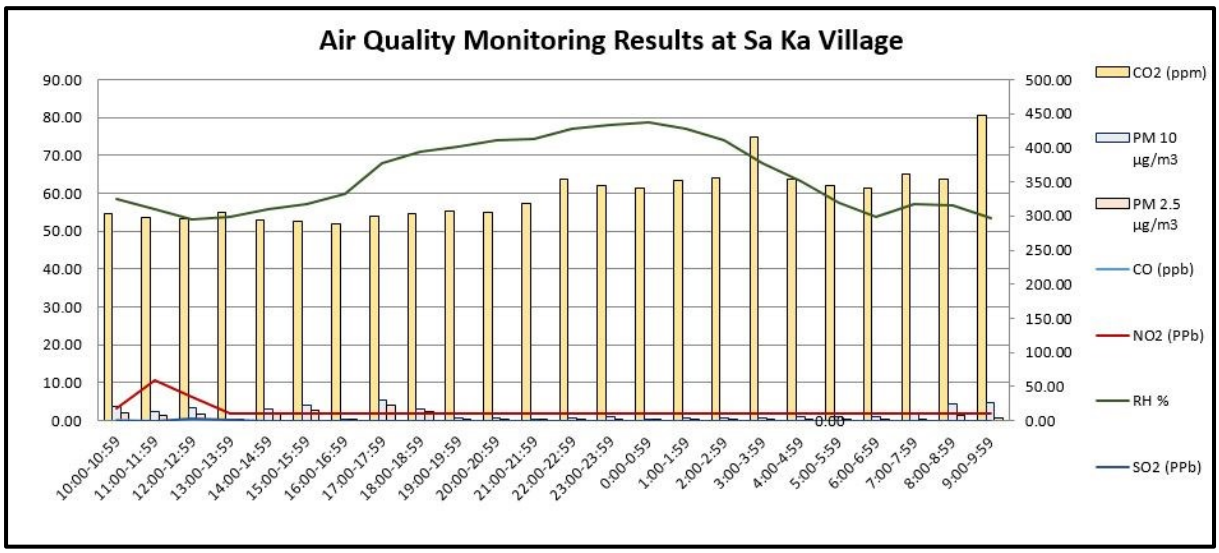

Figure 4. 5 Fluctuation of Air Pollutants during dial cycle (Sa Ka Village)

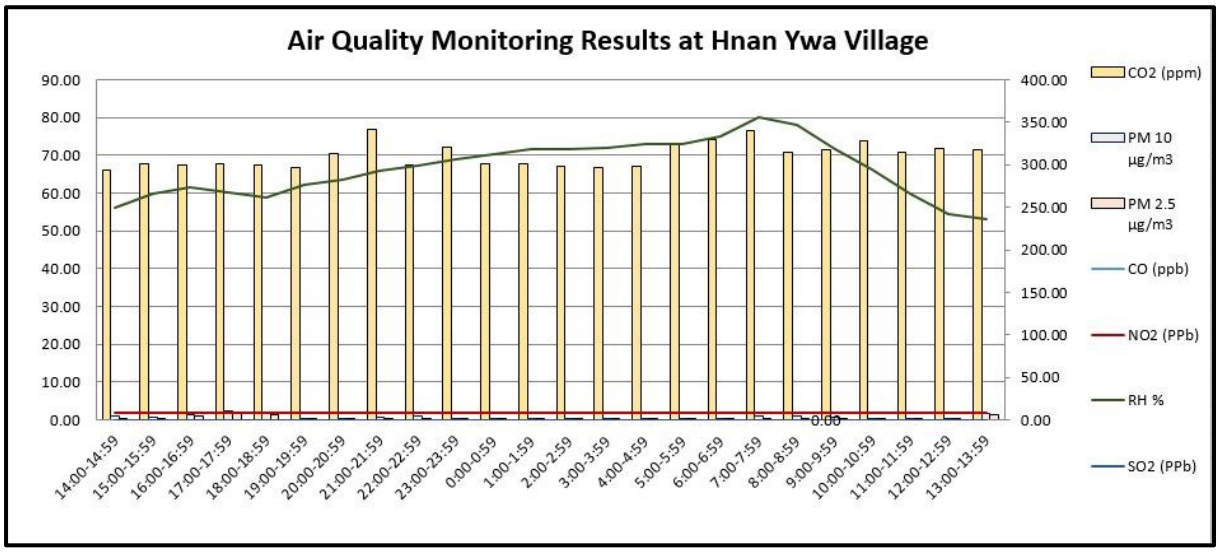

Figure 4. 6 Fluctuation of Air Pollutants during dial cycle (Hnan Ywa Village)

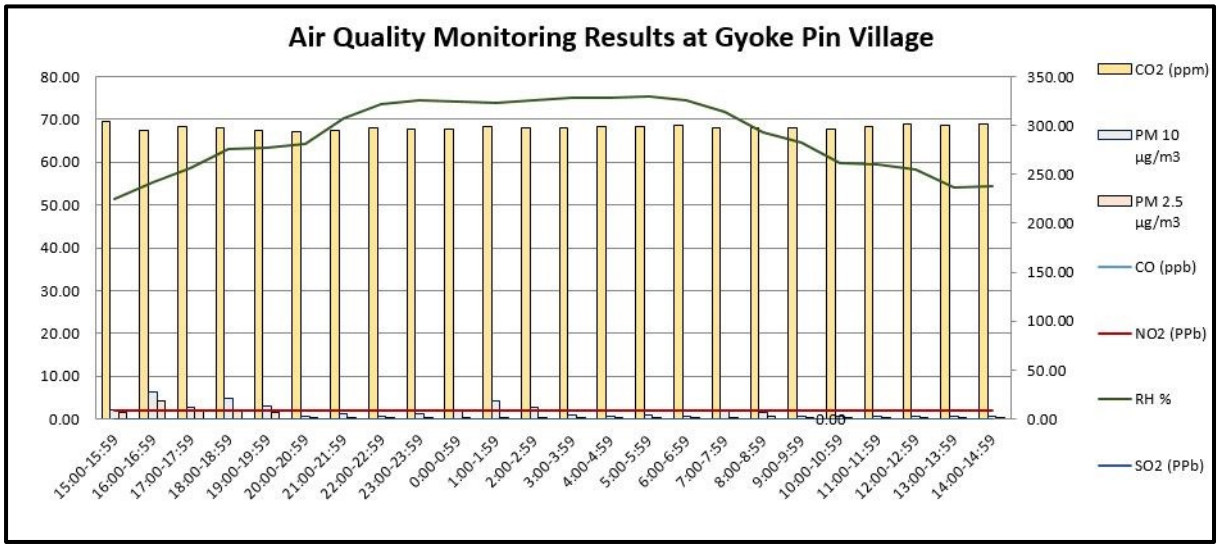

Figure 4. 7 Fluctuation of Air Pollutants during dial cycle (Gyoke Pin Village)

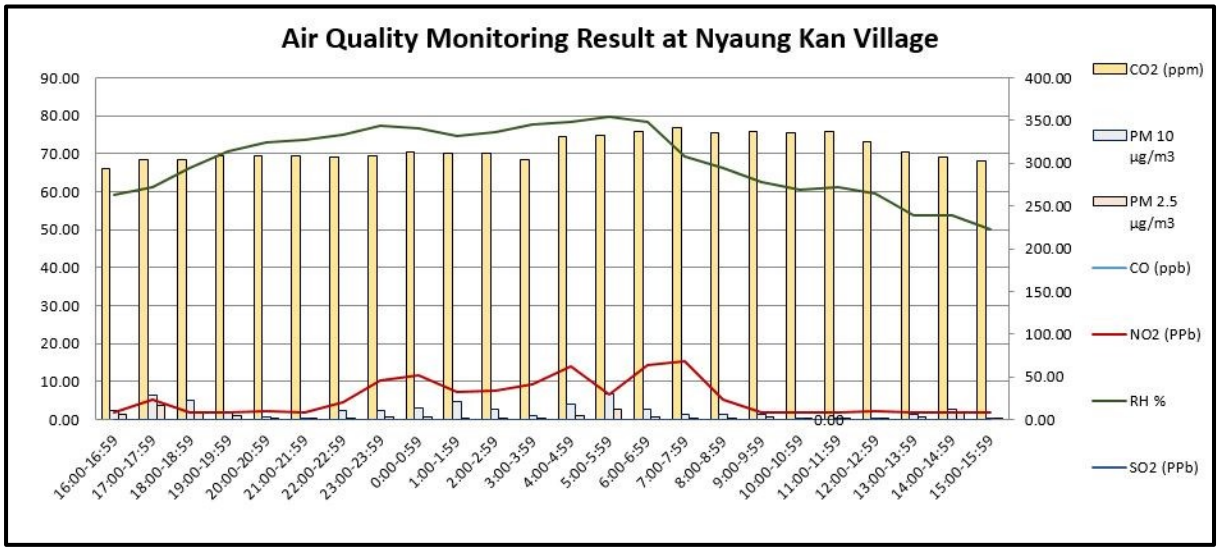

Figure 4. 8 Fluctuation of Air Pollutants during dial cycle (Nyaung Kan Village)

Detail results with one-hour interval of pollutants are shown in **Table 4. 2** to **Table 4. 5**. All results are under the Myanmar National Environmental Quality (emission) Guidelines. So, Sembcorp Myingyan Power Plant is acceptable for environment.

Table 4. 2 Air Monitoring Results (Sa Ka Village)

Date	Time		CO_2 (ppm)	CO (ppb)	NO_2 (ppb)	PM_{10} µg/m^3	$PM_{2.5}$ µg/m^3	RH %	SO_2 (ppb)
10.9.2019	10:00-10:59	Average	303.45	0.08	3.08	20.92	12.08	58.58	0.00
10.9.2019	11:00-11:59	Average	297.53	0.00	10.67	12.42	8.08	55.85	0.00
10.9.2019	12:00-12:59	Average	295.32	0.00	6.08	18.08	9.17	53.05	0.50
10.9.2019	13:00-13:59	Average	305.03	0.00	2.00	2.00	1.00	53.67	0.25
10.9.2019	14:00-14:59	Average	293.80	0.00	2.00	16.92	11.08	55.76	0.00
10.9.2019	15:00-15:59	Average	291.57	0.00	2.00	22.50	15.75	57.01	0.00
10.9.2019	16:00-16:59	Average	288.18	0.00	2.00	2.00	1.00	59.84	0.00
10.9.2019	17:00-17:59	Average	298.95	0.00	2.00	30.17	22.42	68.00	0.00
10.9.2019	18:00-18:59	Average	303.43	0.00	2.00	17.50	13.92	70.85	0.00
10.9.2019	19:00-19:59	Average	306.67	0.00	2.00	3.67	1.58	72.40	0.00
10.9.2019	20:00-20:59	Average	306.15	0.00	2.00	3.92	1.75	74.02	0.00
10.9.2019	21:00-21:59	Average	318.68	0.00	2.00	2.00	1.00	74.23	0.00
10.9.2019	22:00-22:59	Average	353.35	0.00	2.00	3.92	1.00	77.12	0.00
10.9.2019	23:00-23:59	Average	345.48	0.00	2.00	4.83	1.00	78.08	0.00
11.9.2019	0:00-0:59	Average	341.12	0.00	2.00	2.00	1.00	78.81	0.00
11.9.2019	1:00-1:59	Average	351.42	0.00	2.00	3.58	1.00	77.17	0.00
11.9.2019	2:00-2:59	Average	356.22	0.00	2.00	3.17	1.00	73.97	0.00
11.9.2019	3:00-3:59	Average	416.78	0.00	2.00	2.92	1.00	67.81	0.00
11.9.2019	4:00-4:59	Average	353.87	0.00	2.00	5.67	1.00	63.37	0.00
11.9.2019	5:00-5:59	Average	345.05	0.00	2.00	4.83	1.08	57.58	0.00
11.9.2019	6:00-6:59	Average	341.83	0.00	2.00	5.00	1.17	53.83	0.00
11.9.2019	7:00-7:59	Average	362.03	0.00	2.00	8.50	1.17	57.04	0.00
11.9.2019	8:00-8:59	Average	354.13	0.00	2.00	25.25	6.92	56.84	0.00
11.9.2019	9:00-9:59	Average	448.60	0.00	2.00	25.50	3.67	53.43	0.00
Average			332.44	0.00	2.58	10.30	4.99	64.51	0.03
1 hour Minimum			288.18	0.00	2.00	2.00	1.00	53.05	0.00
1 hour Maximum			448.60	0.08	10.67	30.17	22.42	78.81	0.50

Table 4. 3 Air Monitoring Results (Hnan Ywa Village)

Date	Time		CO_2 (ppm)	CO (ppb)	NO_2 (ppb)	PM_{10} µg/m^3	$PM_{2.5}$ µg/m^3	RH %	SO_2 (ppb)
11.9.2019	14:00-14:59	Average	293.25	0.00	2.00	5.17	1.08	56.27	0.00
11.9.2019	15:00-15:59	Average	301.03	0.00	2.00	2.67	1.00	59.93	0.00
11.9.2019	16:00-16:59	Average	299.95	0.00	2.00	6.17	4.25	61.62	0.00
11.9.2019	17:00-17:59	Average	300.53	0.00	2.00	10.83	7.67	60.10	0.00
11.9.2019	18:00-18:59	Average	299.35	0.00	2.00	9.58	6.50	58.92	0.00
11.9.2019	19:00-19:59	Average	297.07	0.00	2.00	2.08	1.00	62.21	0.00
11.9.2019	20:00-20:59	Average	313.40	0.00	2.00	2.00	1.00	63.53	0.00
11.9.2019	21:00-21:59	Average	341.25	0.00	2.00	3.58	1.92	65.96	0.00
11.9.2019	22:00-22:59	Average	299.55	0.00	2.00	4.67	1.67	67.41	0.00
11.9.2019	23:00-23:59	Average	320.15	0.00	2.00	2.25	1.17	69.05	0.00
12.9.2019	0:00-0:59	Average	300.68	0.00	2.00	2.00	1.00	70.25	0.00
12.9.2019	1:00-1:59	Average	300.55	0.00	2.00	2.00	1.00	71.56	0.00
12.9.2019	2:00-2:59	Average	298.52	0.00	2.00	2.00	1.00	71.58	0.00
12.9.2019	3:00-3:59	Average	296.90	0.00	2.00	2.00	1.00	72.16	0.00
12.9.2019	4:00-4:59	Average	298.40	0.00	2.00	2.00	1.00	73.08	0.00
12.9.2019	5:00-5:59	Average	323.50	0.00	2.00	2.00	1.00	73.12	0.00
12.9.2019	6:00-6:59	Average	329.88	0.00	2.00	2.00	1.00	75.11	0.00
12.9.2019	7:00-7:59	Average	340.72	0.00	2.00	4.50	1.00	79.94	0.00
12.9.2019	8:00-8:59	Average	315.42	0.00	2.00	4.25	1.00	77.93	0.00
12.9.2019	9:00-9:59	Average	317.13	0.00	2.00	2.42	1.33	71.82	0.00
12.9.2019	10:00-10:59	Average	328.12	0.00	2.00	2.00	1.17	66.40	0.00
12.9.2019	11:00-11:59	Average	315.15	0.00	2.00	2.00	1.00	59.84	0.00
12.9.2019	12:00-12:59	Average	319.80	0.00	2.00	2.00	1.00	54.32	0.00
12.9.2019	13:00-13:59	Average	317.50	0.00	2.00	7.00	5.58	52.99	0.00
Average			311.16	0.00	2.00	3.63	1.93	66.46	0.00
1 hour Minimum			293.25	0.00	2.00	2.00	1.00	52.99	0.00
1 hour Maximum			341.25	0.00	2.00	10.83	7.67	79.94	0.00

Table 4. 4 Air Monitoring Results (Gyoke Pin Village)

Date	Time		CO_2 (ppm)	CO (ppb)	NO_2 (ppb)	PM_{10} µg/m^3	$PM_{2.5}$ µg/m^3	RH %	SO_2 (ppb)
12.9.2019	15:00-15:59	Average	304.63	0.00	2.00	9.50	7.17	51.48	0.00
12.9.2019	16:00-16:59	Average	295.22	0.00	2.00	27.58	18.33	55.32	0.00
12.9.2019	17:00-17:59	Average	299.02	0.00	2.00	12.33	7.67	58.47	0.00
12.9.2019	18:00-18:59	Average	297.75	0.00	2.00	20.92	9.83	62.98	0.00
12.9.2019	19:00-19:59	Average	294.98	0.00	2.00	13.08	6.92	63.46	0.00
12.9.2019	20:00-20:59	Average	293.93	0.00	2.00	2.42	1.00	64.34	0.00
12.9.2019	21:00-21:59	Average	294.55	0.00	2.00	5.25	1.00	70.22	0.00
12.9.2019	22:00-22:59	Average	297.05	0.00	2.00	2.00	1.00	73.48	0.00
12.9.2019	23:00-23:59	Average	296.68	0.00	2.00	5.50	1.58	74.54	0.00
13.9.2019	0:00-0:59	Average	296.85	0.00	2.00	9.58	1.00	74.08	0.00
13.9.2019	1:00-1:59	Average	298.53	0.00	2.00	18.58	1.00	73.84	0.00
13.9.2019	2:00-2:59	Average	298.30	0.00	2.00	11.33	1.25	74.54	0.00
13.9.2019	3:00-3:59	Average	297.50	0.00	2.00	3.42	1.67	74.98	0.00
13.9.2019	4:00-4:59	Average	299.20	0.00	2.00	2.42	1.00	75.22	0.00
13.9.2019	5:00-5:59	Average	298.90	0.00	2.00	4.50	1.33	75.37	0.00
13.9.2019	6:00-6:59	Average	300.43	0.00	2.00	2.17	1.17	74.44	0.00
13.9.2019	7:00-7:59	Average	297.32	0.00	2.00	7.50	1.58	71.72	0.00
13.9.2019	8:00-8:59	Average	298.07	0.00	2.00	6.67	2.08	67.14	0.00
13.9.2019	9:00-9:59	Average	297.80	0.00	2.00	2.08	1.00	64.58	0.00
13.9.2019	10:00-10:59	Average	296.93	0.00	2.00	2.00	1.08	59.76	0.00
13.9.2019	11:00-11:59	Average	298.78	0.00	2.00	2.00	1.00	59.55	0.00
13.9.2019	12:00-12:59	Average	302.12	0.00	2.00	2.00	1.00	58.34	0.00
13.9.2019	13:00-13:59	Average	300.43	0.00	2.00	2.00	1.00	54.24	0.00
13.9.2019	14:00-14:59	Average	302.07	0.00	2.00	2.00	1.00	54.29	0.00
Average			298.21	0.00	2.00	7.37	3.03	66.10	0.00
1 hour Minimum			293.93	0.00	2.00	2.00	1.00	51.48	0.00
1 hour Maximum			304.63	0.00	2.00	27.58	18.33	75.37	0.00

Table 4. 5 Air Monitoring Results (Nyaung Kan Village)

Date	Time		CO_2 (ppm)	CO (ppb)	NO_2 (ppb)	PM_{10} µg/m3	$PM_{2.5}$ µg/m3	RH %	SO_2 (ppb)
13.9.2019	16:00-16:59	Average	293.33	0.00	2.00	10.33	6.25	59.02	0.00
13.9.2019	17:00-17:59	Average	304.93	0.00	5.08	29.25	16.08	61.21	0.00
13.9.2019	18:00-18:59	Average	304.93	0.00	2.00	22.08	8.33	66.27	0.00
13.9.2019	19:00-19:59	Average	309.17	0.00	2.00	8.92	4.67	70.56	0.00
13.9.2019	20:00-20:59	Average	309.25	0.00	2.17	3.08	1.17	73.07	0.00
13.9.2019	21:00-21:59	Average	308.12	0.00	2.00	2.00	1.08	73.68	0.00
13.9.2019	22:00-22:59	Average	306.65	0.00	4.50	11.08	1.92	75.03	0.00
13.9.2019	23:00-23:59	Average	309.23	0.00	10.25	10.17	2.75	77.37	0.00
14.9.2019	0:00-0:59	Average	313.33	0.00	11.67	13.08	2.58	76.72	0.00
14.9.2019	1:00-1:59	Average	311.45	0.00	7.17	20.58	1.00	74.62	0.00
14.9.2019	2:00-2:59	Average	311.72	0.00	7.58	12.42	1.00	75.65	0.00
14.9.2019	3:00-3:59	Average	304.65	0.00	9.25	4.42	1.75	77.60	0.00
14.9.2019	4:00-4:59	Average	331.48	0.00	14.08	17.75	5.00	78.54	0.00
14.9.2019	5:00-5:59	Average	332.64	0.00	6.50	29.83	11.83	79.63	0.00
14.9.2019	6:00-6:59	Average	336.68	0.00	14.42	11.33	3.17	78.25	0.00
14.9.2019	7:00-7:59	Average	342.12	0.00	15.42	6.25	1.33	69.31	0.00
14.9.2019	8:00-8:59	Average	336.20	0.00	5.08	5.75	1.00	66.21	0.00
14.9.2019	9:00-9:59	Average	337.52	0.00	2.00	5.58	3.75	62.60	0.00
14.9.2019	10:00-10:59	Average	336.13	0.00	2.00	2.00	1.00	60.59	0.00
14.9.2019	11:00-11:59	Average	337.43	0.00	2.00	2.00	1.00	61.35	0.00
14.9.2019	12:00-12:59	Average	325.10	0.00	2.33	2.00	1.00	59.44	0.00
14.9.2019	13:00-13:59	Average	313.63	0.00	2.00	6.58	3.75	53.95	0.00
14.9.2019	14:00-14:59	Average	307.68	0.00	2.00	12.17	8.33	53.87	0.00
14.9.2019	15:00-15:59	Average	303.07	0.00	2.00	2.00	1.00	50.19	0.00
Average			317.77	0.00	5.65	10.44	3.78	68.11	0.00
1 hour Minimum			293.33	0.00	2.00	2.00	1.00	50.19	0.00
1 hour Maximum			342.12	0.00	15.42	29.83	16.08	79.63	0.00

4.2 Wind Speed and Direction

The following figure describes the wind speed and wind direction of the proposed project site on, 10 to 14 September 2019 respectively. According to the data, the wind direction is following **Figure 4. 9 to Figure 4. 16.**

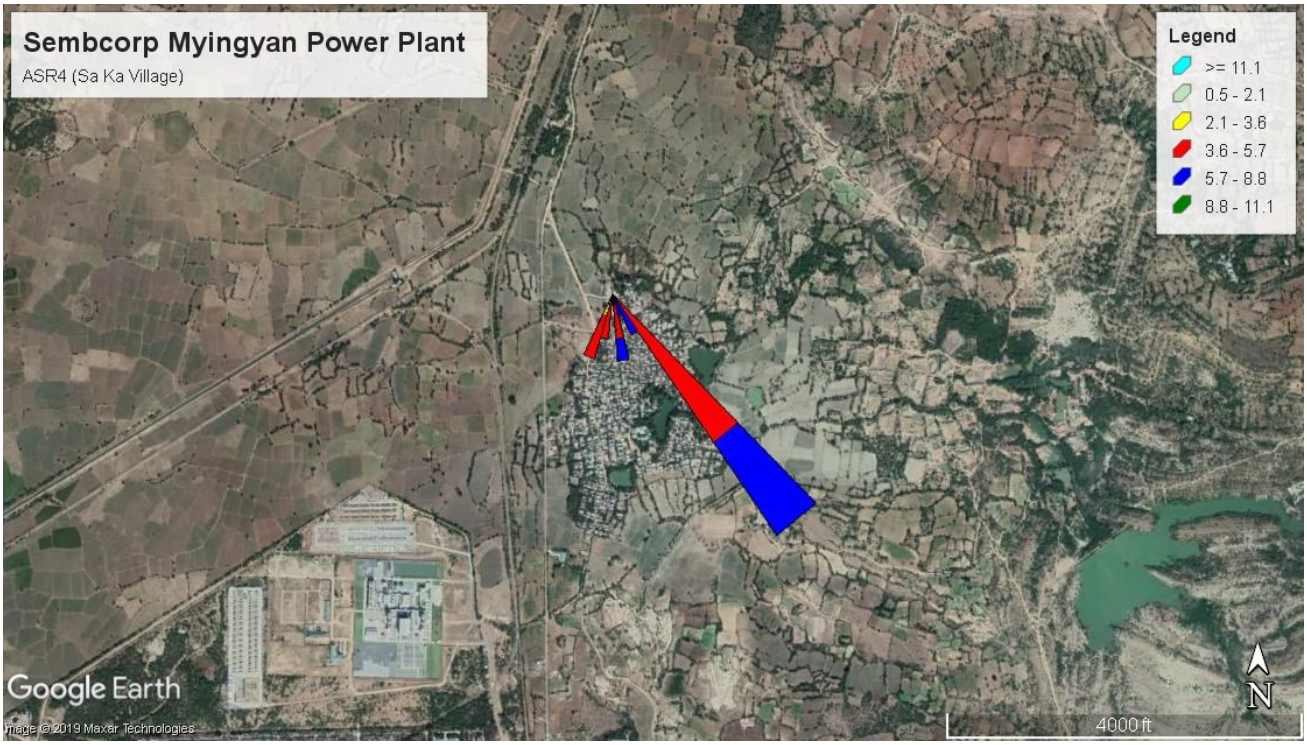

Figure 4. 9 Wind Speed and Wind Direction (Blowing From) at Sa Ka Village (ASR4)

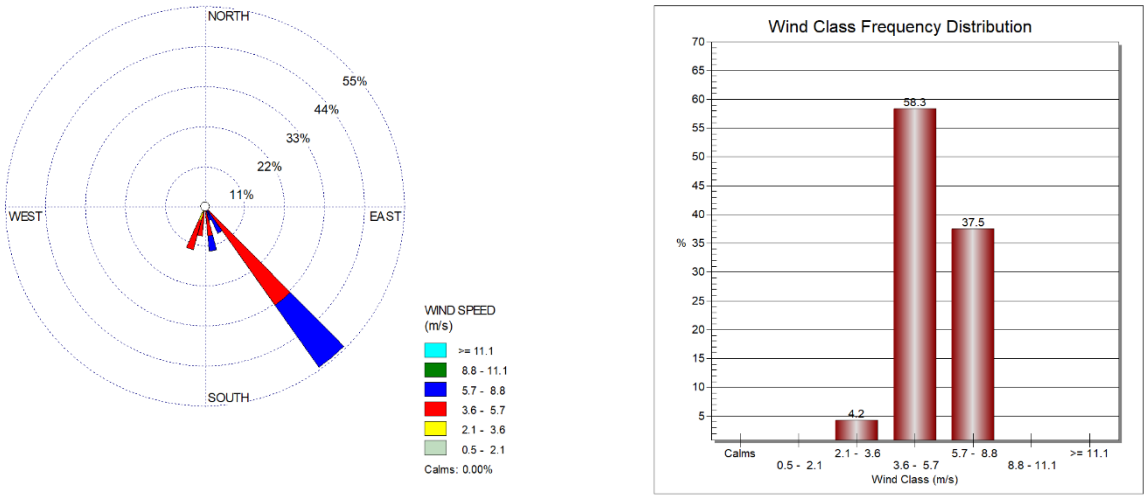

Figure 4. 10 Wind Class Frequency Distribution at Sa Ka Village (ASR4)

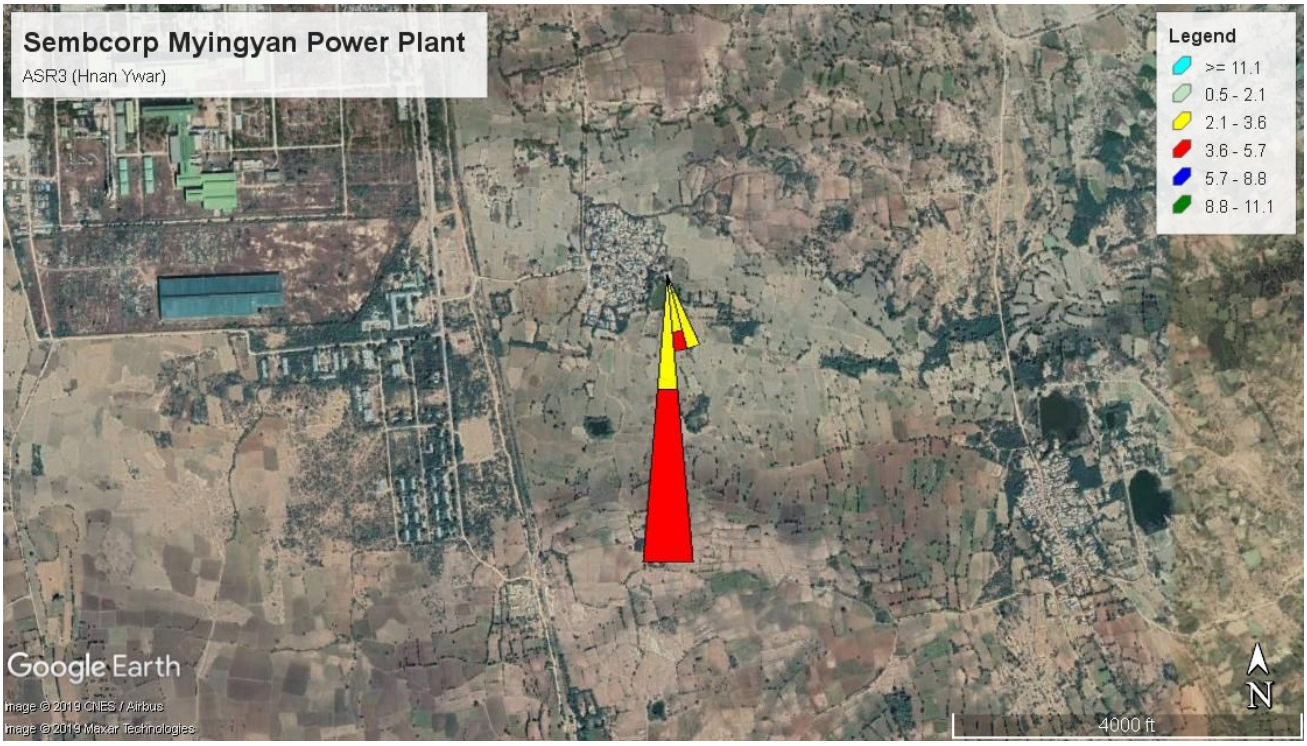

Figure 4. 11 Wind Speed and Wind Direction (Blowing From) at Hnan Ywa Village (ASR3)

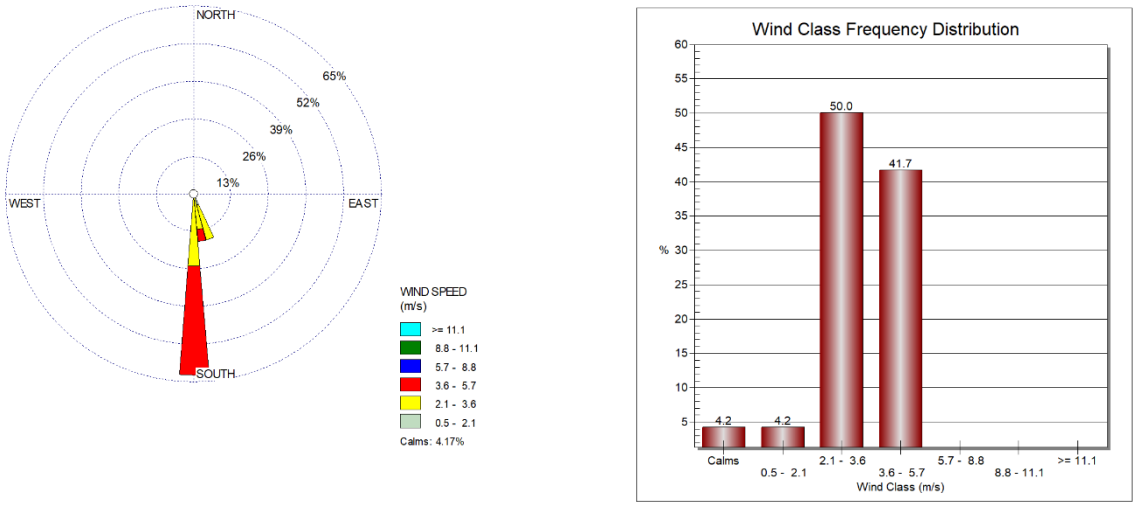

Figure 4. 12 Wind Class Frequency Distribution at Hnan Ywa Village (ASR3)

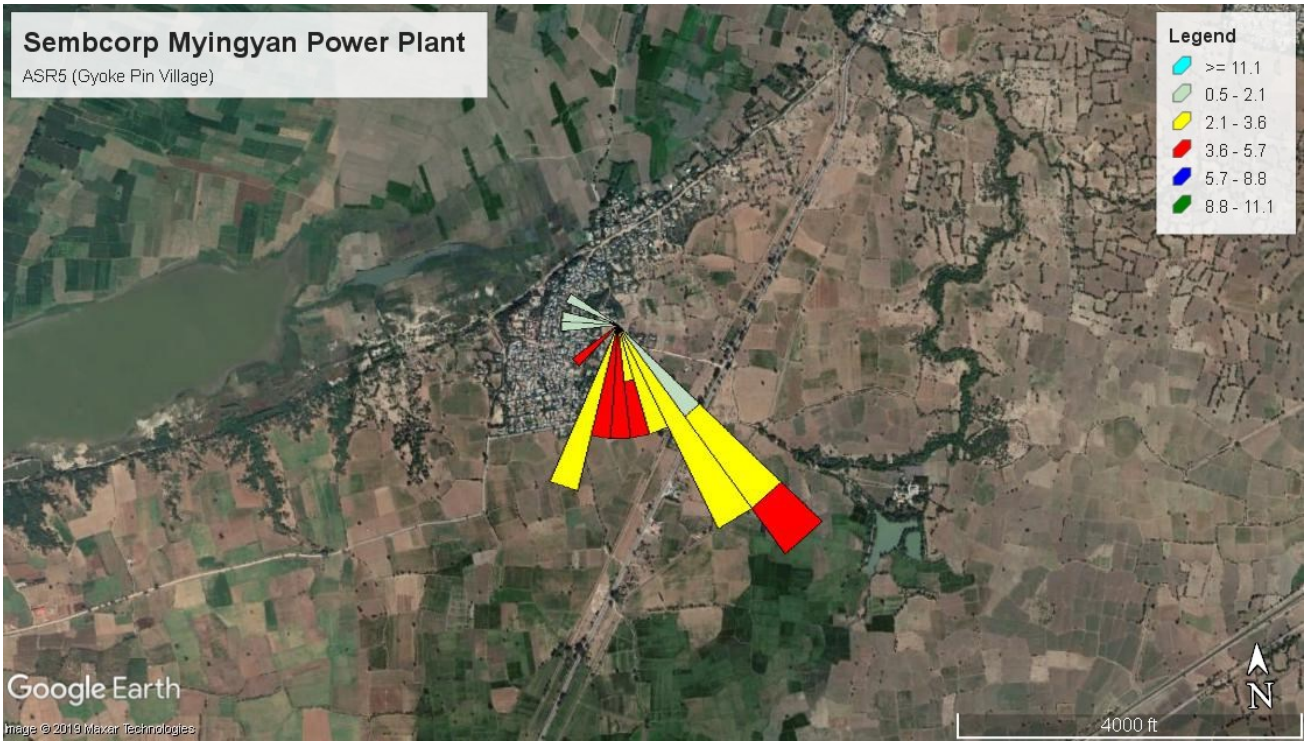

Figure 4. 13 Wind Speed and Wind Direction (Blowing From) at Gyoke Pin Village (ASR5)

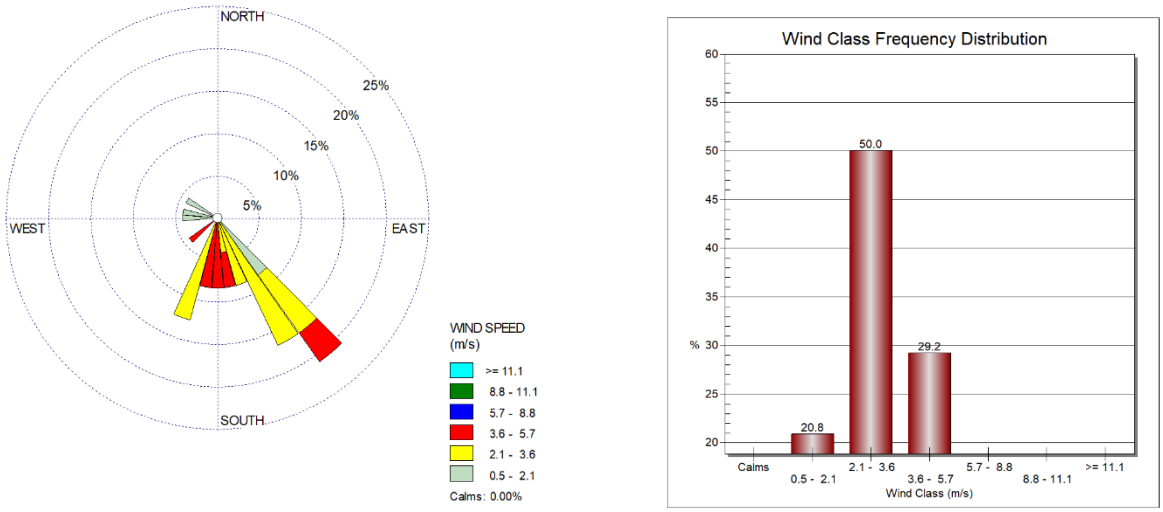

Figure 4. 14 Wind Class Frequency Distribution at Gyoke Pin Village (ASR5)

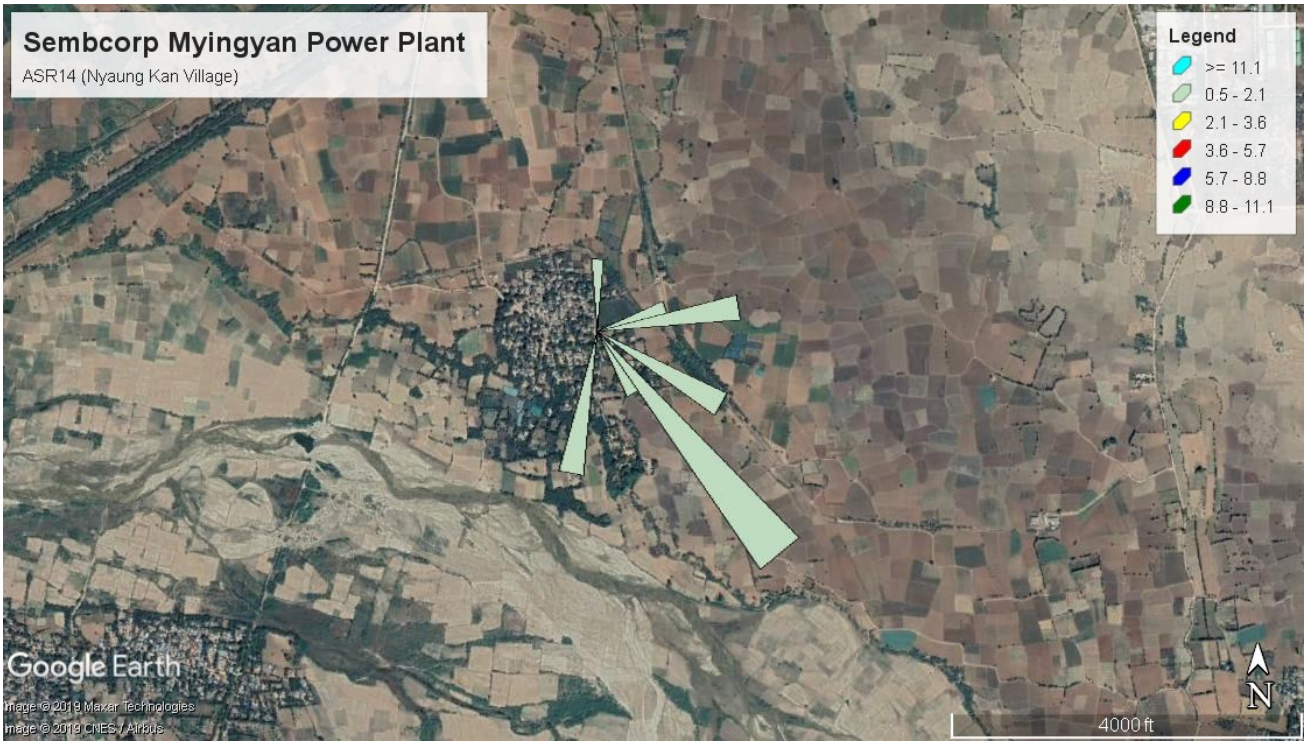

Figure 4. 15 Wind Speed and Wind Direction (Blowing From) at Nyaung Kan Village (ASR14)

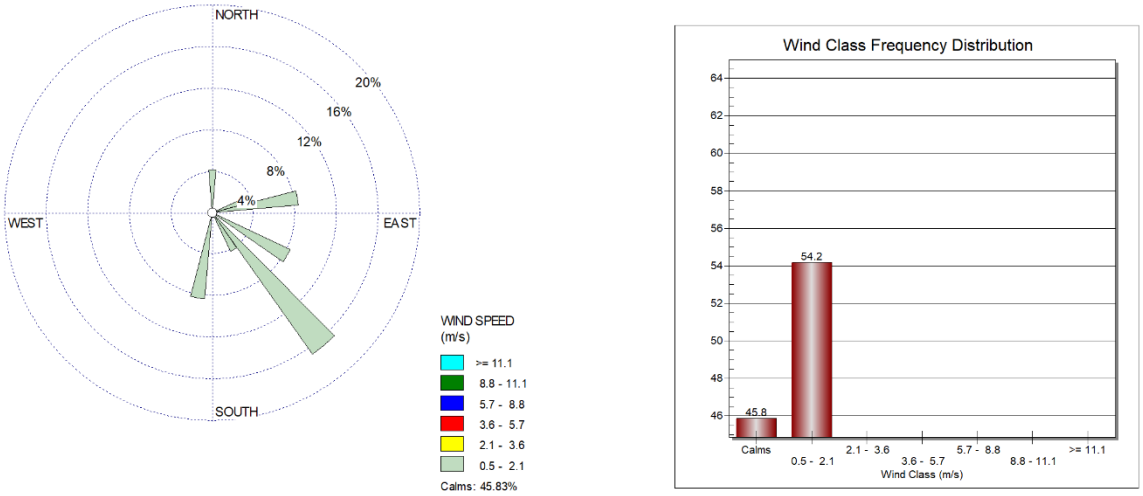

Figure 4. 16 Wind Class Frequency Distribution at Nyaung Kan Village (ASR14)

4.3 Ambient Noise

Ambient noise level for the proposed project was measured with Digital Sound Level Meter at the project site. The noise level measurement is conducted at sembcorp myingyan power points: these points are nearly sembcop myingyan power plant and air monitoring point at sa ka village on 10 to 12 September 2019. Measuring period is 24 hours continuously. The observed values are described in **Table 4. 6 to Table 4. 9** and the following figures are noise level measurement at the proposed project.

Table 4. 6 Observed Values of Noise Level Measurement at near Sembcorp Myingyan Power Plant

No.	Date	Time	Observed Mean Value (Source)	Weight	Day/Night	Average
1	12.9.2019	7:00:13-7:59:13	63.53	A	Day	
2	12.9.2019	8:00:13-8:59:13	64.43	A	Day	
3	12.9.2019	9:00:13-9:59:13	64.60	A	Day	
4	12.9.2019	10:00:13-10:59:13	64.69	A	Day	
5	11.9.2019	11:00:13-11:59:13	62.47	A	Day	
6	11.9.2019	12:00:13-12:59:13	62.70	A	Day	
7	11.9.2019	13:00:13-13:59:13	62.68	A	Day	
8	11.9.2019	14:00:13-14:59:13	73.08	A	Day	66.37
9	11.9.2019	15:00:13-15:59:13	70.47	A	Day	
10	11.9.2019	16:00:13-16:59:13	68.80	A	Day	
11	11.9.2019	17:00:13-17:59:13	68.18	A	Day	
12	11.9.2019	18:00:13-18:59:13	67.96	A	Day	
13	11.9.2019	19:00:13-19:59:13	67.43	A	Day	
14	11.9.2019	20:00:13-20:59:13	67.54	A	Day	
15	11.9.2019	21:00:13-21:59:13	66.98	A	Day	
16	11.9.2019	22:00:13-22:59:13	67.04	A	Night	
17	11.9.2019	23:00:13-23:59:13	67.06	A	Night	
18	12.9.2019	0:00:13-0:59:13	67.14	A	Night	
19	12.9.2019	1:00:13-1:59:13	69.87	A	Night	
20	12.9.2019	2:00:13-2:59:13	67.64	A	Night	67.31
21	12.9.2019	3:00:13-3:59:13	67.34	A	Night	
22	12.9.2019	4:00:13-4:59:13	68.02	A	Night	
23	12.9.2019	5:00:13-5:59:13	66.34	A	Night	
24	12.9.2019	6:00:13-6:59:13	65.36	A	Night	
Average			**66.72**			

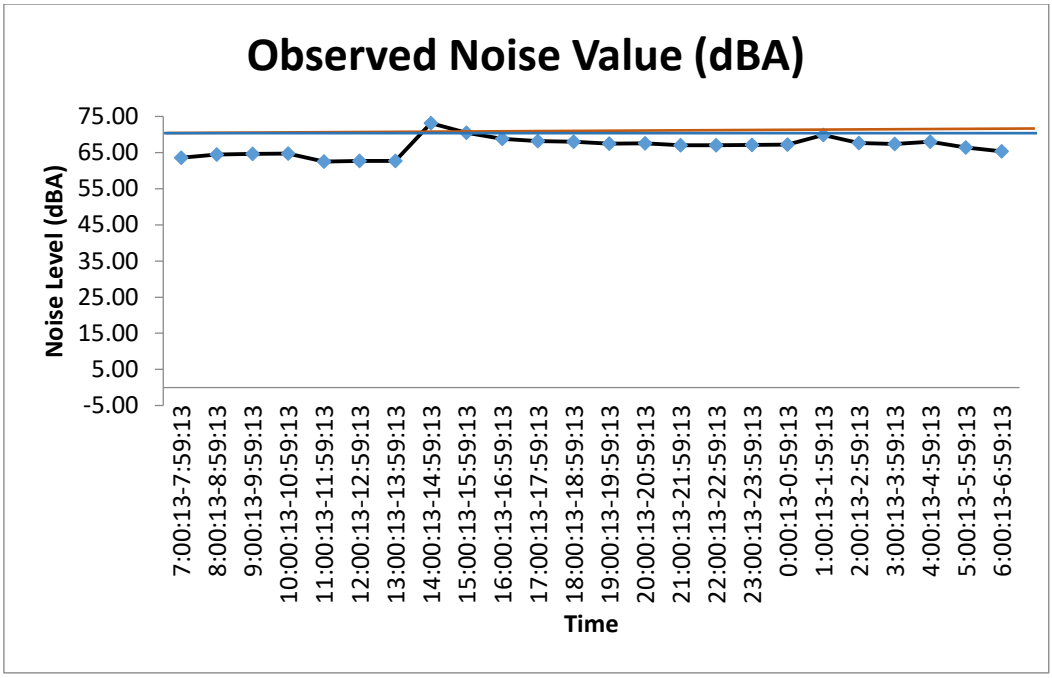

Figure 4. 17 Noise Level at near Sembcorp Myingyan Power Plant

Table 4. 7 Observed Values of Noise Level Measurement at Sa Ka Village

No.	Date	Time	Observed Mean Value (Source)	Weight	Day/Night	Average
1	11.9.2019	7:00:13-7:59:13	54.03	A	Day	52.19
2	11.9.2019	8:00:13-8:59:13	53.47	A	Day	
3	11.9.2019	9:00:13-9:59:13	54.70	A	Day	
4	10.9.2019	10:00:13-10:59:13	54.66	A	Day	
5	10.9.2019	11:00:13-11:59:13	52.13	A	Day	
6	10.9.2019	12:00:13-12:59:13	51.35	A	Day	
7	10.9.2019	13:00:13-13:59:13	51.34	A	Day	
8	10.9.2019	14:00:13-14:59:13	52.47	A	Day	
9	10.9.2019	15:00:13-15:59:13	52.97	A	Day	
10	10.9.2019	16:00:13-16:59:13	53.32	A	Day	
11	10.9.2019	17:00:13-17:59:13	49.54	A	Day	
12	10.9.2019	18:00:13-18:59:13	52.97	A	Day	
13	10.9.2019	19:00:13-19:59:13	49.86	A	Day	
14	10.9.2019	20:00:13-20:59:13	49.83	A	Day	
15	10.9.2019	21:00:13-21:59:13	50.17	A	Day	
16	10.9.2019	22:00:13-22:59:13	48.03	A	Night	50.59
17	10.9.2019	23:00:13-23:59:13	49.88	A	Night	
18	11.9.2019	0:00:13-0:59:13	48.08	A	Night	
19	11.9.2019	1:00:13-1:59:13	48.58	A	Night	
20	11.9.2019	2:00:13-2:59:13	50.87	A	Night	

21	11.9.2019	3:00:13-3:59:13	51.51	A	Night	
22	11.9.2019	4:00:13-4:59:13	52.83	A	Night	
23	11.9.2019	5:00:13-5:59:13	51.72	A	Night	
24	11.9.2019	6:00:13-6:59:13	53.78	A	Night	
Average			**51.59**			

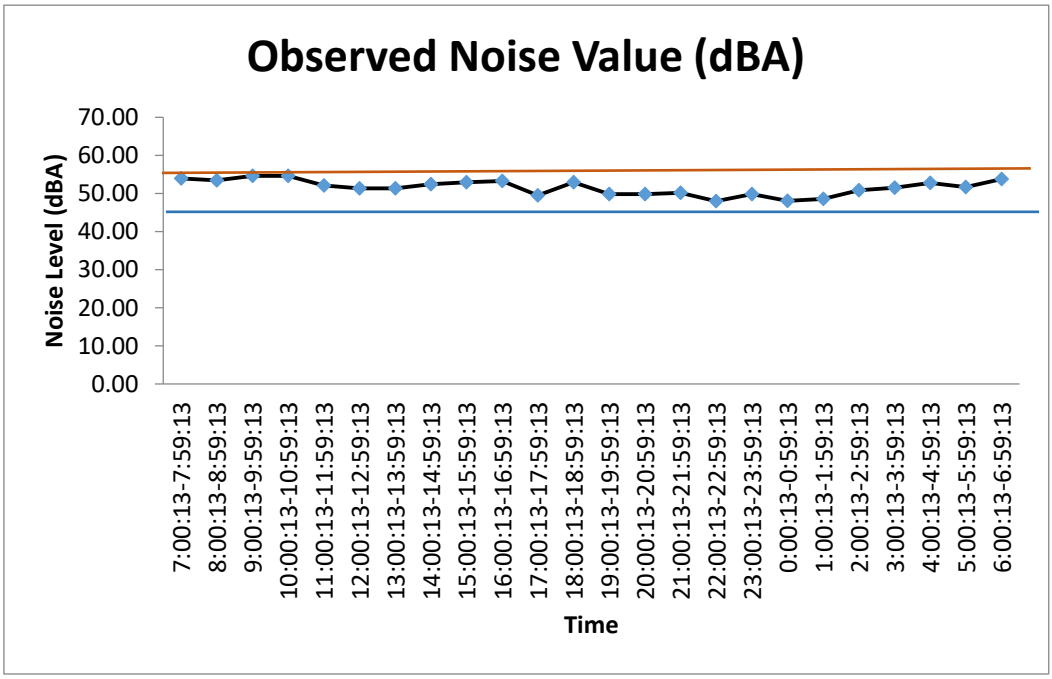

Figure 4. 18 Noise Level at Sa Ka Village

Table 4. 8 Observed Ambient Noise level Results from Myingyan Power Plant

Point	**Sembcorp Myingyan Power Plant**	
	Day Time	Night Time
Sembcorp Myingyan Power Plant	66.37	67.31
Guideline Values	70	70

Table 4. 9 Observed Ambient Noise level Results from Sa Ka Village

Point	**Sembcorp Myingyan Power Plant**	
	Day Time	Night Time
Sa Ka Village	52.91	50.59
Guideline Values	55	45

The observed values of sembcorp myingyan power plant are lower than the guidelines. So, Sembcorp myingyan power plant is acceptable for environmental. The observed values are compared with the National Environmental Quality (Emission) Guidelines as shown in **Table 4. 10** which indicates the separate level for residential and industrial points.

Table 4. 10 National Environmental Quality (Emission) Guidelines Values for Noise Level

Receptor	One Hour LAeq (dBA)	
	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

The observed values of the proposed project for daytime at sembcorp myingyan power plant and Sa Ka village are 66.37 dB (A) and 52.19 dB (A). The observed values of the proposed project for night time at sembcorp myingyan power plant and Sa Ka village are 67.31 dB (A) and 50.59 dB (A). The proposed project is located adjacent to the residential and commercial area. So, the observed values of daytime and nighttime at sembcorp myingyan power plant are under the National Environmental Quality (Emission) Guidelines. The observed values of daytime at Sa Ka Village is under the National Environmental Quality (Emission) Guidelines The observed values of nighttime at Sa Ka village is upper the National Environmental Quality (Emission) Guidelines because this monitoring location is Sa Ka North Monastery. This monastery have near road. This monastery have devotional of Buddha. This road is passing through motor cycle and cars. So, The observed values of nighttime at Sa Ka village is upper the National Environmental Quality (Emission) Guidelines. But, Sa Ka village is acceptable Applicable Operational Noise Criteria of 54 dB (A) from ESIA Report.

APPENDIX A

Description of Haz-scanner (EPAS)

Publication 1601 Rev 1406

HAZ-SCANNER EPAS

Wireless Environmental Perimeter Air Station

HAZ-SCANNER EPAS shown with optional solar panels

Performance Profile

The HAZ-SCANNER EPAS is optimized for ambient air applications; custom calibration for specific ranges or applications is available upon request.

Display	LCD real time
Operation	4-key splash-proof membrane switch
Power	12-V Absorption Glass Mat (AGM) rechargable battery, 100-240 V AC, or optional solar panel
Display Measurements	Max, Min, TWA, STEL
Recording Time	1 sec to 21 weeks
Sampling Rate	1 sec, 1 min, 10 min, 1 hr, adjustable
Data Storage	450,560 data points
Sampling Pump	1.0 to 3.0 L/min
Digital Output	RS-232 (PC), RS-422 (Mac)
Software	PC or Mac
Dimensions (weather-proof case)	6 x 14 x 10 in (15.2 x 35.6 x 25.4 cm)
Weight	12 lbs (5.4 kg)
Operating Temperature	23 to 122 F (-5 to 50 C)
Storage Temperature	-40 to 140 F (-40 to 60 C)
Humidity	95% non-condensing (use inlet heater)
Wireless Radio Modem	900 MHz (U.S.), 868 MHz (Euro) up to 5 miles - line of sight (optional)
Auxiliary Analog Input	0 to 2.5 VDC (1 channel for alternative meter)

Configure an EPAS for Up to 14 Simultaneous Measurements

The standard HAZ-SCANNER EPAS includes the monitor (calibrated for ambient air applications) with sensors/meters for PM10 or TSP, VOCs, temperature, humidity, and wind speed/direction in a NEMA 4 enclosure, acid gas scrubber, internal battery, universal 110-240 V AC battery charger, software, cables, and CD with instructions.

Configure the monitor with additional sensors/meters — up to 4 optional interchangable sensors with upgradable software and/or up to 4 EPAS-specific meters (listed below). **See page 3 for specifications.** ***Specify sensors and meters when ordering.***

- PM1.0, 2.5, or 4.0
- Ammonia (EC)
- Carbon Dioxide (NDIR)
- Carbon Monoxide (EC)
- Chlorine (EC)
- Ethylene Oxide (EL)
- Hydrocarbon (methane-specific, EC)
- Hydrocarbons (EC)
- Hydrogen Chloride (EL)
- Hydrogen Cyanide (EC)
- Hydrogen Sulfide (EC)
- Nitric Oxide (EC)
- Nitrogen Dioxide
- Oxygen
- Ozone
- Phosphine (EL)
- Sulfur Dioxide
- Rain
- Solar Radiance
- Sound and Noise
- Atomic Radiation
- ELF Radiation
- Barometric Pressure
- Dew Point Temperature
- Wet Bulb Temperature

Contact SKC to build an EPAS with available sensors/meters/calibration for your application!

SKC Inc. 724-941-9701 SKC West 714-992-2780 SKC Gulf Coast 281-859-8050 SKC South 434-852-7149
www.skcinc.com

HAZ-SCANNER EPAS

Wireless Environmental Perimeter Air Station

HAZ-SCANNER EPAS Sensor/Meter Specifications

Parameter	Sensor*	Measurement/ Concentration Range	Accuracy	Minimum Resolution	Display Resolution	Additional Information
Particulates	90° infrared light scattering	0 to 5000 µg/m³	Greater of < ± 10% of reading or 0.2% full scale	10 µg/m³	1 µg/m³	Measures particle sizes 10 µm or TSP (standard) or 1, 2.5, or 4 µm (optional) in the 0.1 to 100 µm size range
VOCs	PID (10.6 eV)	0 to 50,000 ppb (0 to 50 ppm)	Greater of < ± 10% of reading or 2% full scale	5 ppb	1 ppb	Minimum detection level is 0.01 ppm. Standard sensor
Toxic Gas: NH_3 - Ammonia	Gas-sensing semiconductor (GSS) technology	0 to 100 ppm	Greater of < ± 10% of reading or 2% full scale	< 0.2 ppm	0.1 ppm	Optional sensor
Toxic Gas: CO_2 - Carbon Dioxide	NDIR	0 to 5000 ppm	Greater of < ± 10% of reading or 2% full scale	50 ppm	1 ppm	Optional sensor
Toxic Gas: CO - Carbon Monoxide	Electrochemical	0 to 10,000 ppb (0 to 10 ppm)	Greater of < ± 10% of reading or 2% full scale	20 ppb	1 ppb	Optional sensor
Toxic Gas: Cl_2 - Chlorine	Electrochemical	0 to 100 ppm	Greater of < ± 10% of reading or 2% full scale	< 0.2 ppm	0.1 ppm	Optional sensor
Toxic Gas: (C_2H_4O) - Ethylene Oxide	Electrochemical	0 to 1500 ppm	Greater of < ± 10% of reading or 2% full scale	8 ppm	1 ppm	Optional sensor
Toxic Gas: Hydrocarbon, CH_4 - Methane-specific	NDIR	0 to 1% Vol., 0 to 10,000 ppm, 0 to 20% LEL	Greater of < ± 10% of reading or 2% full scale	± 50 ppm or 0.1% LEL	50 ppm/ 0.1% LEL	Optional sensor
Toxic Gas: (Non-methane) Hydrocarbons (HC)	NDIR	Calibrated for 0 to 20% LEL of selected gas	Greater of < ± 10% of reading or 2% full scale	± 50 ppm/ 0.1% LEL	50 ppm/ 0.1% LEL	Optional sensor - specify gas type when ordering: ethane, propane, butane, hexane, ethanol, ethylene, or ethylene oxide
Toxic Gas: HCl - Hydrogen Chloride	Electrochemical	0 to 100 ppm	Greater of < ± 10% of reading or 2% full scale	< 0.2 ppm	0.1 ppm	Optional sensor
Toxic Gas: HCN - Hydrogen Cyanide	Electrochemical	0 to 100 ppm	Greater of < ± 10% of reading or 2% full scale	< 0.2 ppm	0.1 ppm	Optional sensor
Toxic Gas: H_2S - Hydrogen Sulfide	Electrochemical	0 to 25 ppm	Greater of < ± 10% of reading or 2% full scale	< 0.15 ppm	0.1 ppm	Optional sensor
Toxic Gas: NO - Nitric Oxide	Electrochemical	0 to 100 ppm	Greater of < ± 10% of reading or 2% full scale	< 0.2 ppm	0.1 ppm	Optional sensor
Toxic Gas: NO_2 - Nitrogen Dioxide	Electrochemical	0 to 5000 ppb (0 to 5 ppm)	Greater of < ± 10% of reading or 2% full scale	5 ppb	1 ppb	Optional sensor
Toxic Gas: O_2 - Oxygen	Electrochemical	0 to 30% Vol.	Greater of < ± 10% of reading or 2% full scale	0.6%	0.1%	Optional sensor
Toxic Gas: O_3 - Ozone	Gas-sensing semiconductor (GSS) technology	0 to 150 ppb (0 to 0.15 ppm), 0 to 500 ppb (0 to 0.5 ppm)	Greater of < ± 10% of reading or 2% full scale	1 ppb	1 ppb	Optional sensor
Toxic Gas: PH_3 - Phosphine	Electrochemical	0 to 100 ppm	Greater of < ± 10% of reading or 2% full scale	< 0.2 ppm	0.1 ppm	Optional sensor
Toxic Gas: SO_2 - Sulfur Dioxide	Electrochemical	0 to 5000 ppb (0 to 5 ppm) for ambient applications	Greater of < ± 10% of reading or 2% full scale	5 ppb	1 ppb	Optional sensor

* Not approved for intrinsically safe applications; do not use in explosive gas environments.

Specifications continued on next page

SKC Inc. 724-941-9701 SKC West 714-992-2780 SKC Gulf Coast 281-859-8050 SKC South 434-852-7149
www.skcinc.com

HAZ-SCANNER EPAS

Wireless Environmental Perimeter Air Station

HAZ-SCANNER EPAS Sensor/Meter Specifications *(con't)*

Parameter	Sensor*	Measurement/ Concentration Range	Accuracy	Minimum Resolution	Display Resolution	Additional Information
Rain Fall/ Precipitation	Rain gauge (heated, tipping bucket)	0 to 5 inches daily	± 1% at 2 in/hr	0.01 in	0.01 in/tip	Optional meter
Temperature	NTC thermister	-4 to 140 F (-20 to 60 C)	Greater of ± 3% degree F or C of reading	1 degree F or C	1 degree F or C	Standard sensor
Relative Humidity (RH)	Thin-film capacitive	0 to 100% RH	± 2% RH	1% RH	1% RH	Standard sensor
Solar Radiance Intensity	Photodiode	1110 watts/ square meter (W/m²)	+ 5% of full scale (reference Eppley PSP at 1000 W/m²)	1 W/m²	1 W/m²	Optional meter
Sound and Noise	Type 2 SLM	30 to 130 decibels (dB)	± 1.5 dB	0.1 dB	1 dB	Optional meter
Atomic Radiation	Geiger counter	1 to 19,999 counts per minute (cpm) or 0.001 to 100 milliRad/hr	± 10% Typical, ± 15% Max.	1 cpm or .001 mR/hr	1 cpm or .001 mR/hr	Optional meter
ELF Radiation	Sensor with single-axis probe	1 to 200 gauss (G)	± 10% or 5% FS	1 G	1 G	Optional meter
Wind Speed/ Direction	3-cut anemometer/ continuous rotation potentiometric wind direction vane	0 to 125 mph/ 5 to 355°	± 1 mph or ± 3%/± 3°	1 mph/1°	1 mph/1°	Standard sensor
Barometric Pressure	Piezo resistive	28.25 to 30.75 in Hg	± 0.09 in Hg	0.01 in Hg	0.01 in Hg	Optional sensor
Dew Point Temperature	Software calculation from RH and temperature	8.2 to 122 F (-16 to 50 C)	± 3 F	1 F	1 F	Optional meter - software calculated
Wet Bulb Temperature	Capsulated thermistor with wick	8.2 to 122 F (-16 to 50 C)	± 3 F	1 F	1 F	Optional meter - one meter

* Not approved for intrinsically safe applications; do not use in explosive gas environments.

SKC Inc. 724-941-9701 SKC-West 714-992-2780 SKC Gulf Coast 281-859-8050 SKC South 434-852-7149
www.skcinc.com

Calibration Certificate for Haz-scanner

NANOVA CO., LTD.
Medical Scientific Industrial

Calibration Certificate

Customer	Eguard
System Model	EPAS
System Serial	915081
Calibration Date	2018 April 21

Sensor	Low	Actual	High	Actual
CO	0 ppm	0 ppm	10 ppm	8.2 ppm
CO2	0 ppm	0 ppm	300 ppm	250 ppm
SO2	0 ppm	0 ppm	2 ppm	1.5 ppm
NO2	0 ppm	0 ppm	3 ppm	2.1 ppm
PMA	0 ug/m3	0 ug/m3	23400 ug/m3	21100 ug/m3
PMB	0 ug/m3	0 ug/m3	21000 ug/m3	19100 ug/m3

Temperature **22 deg C**
Relative Humidity **32%**

Note
 # Perform by EDC technican's instruction.
 # This instrument is manufactured by Environmenatl Device Corporation (USA).

Environmental
Devices Corporation

Perform by

Nanda Maung	Technical Service Engineer	Nanova Co;ltd

Yangon Ofice
22A , Shan Yeik Thar Street , Sanchaung Township.
01-2304901 , 01-2304902
Help Line - 09977477774

APPENDIX B

Field Photos

Air Monitoring Point at Sa Ka Village (ASR4) Lat- 21°23’48.662”, Long- 95°23’1.131” 10.9.2019 to 11.9.2019	
Air Monitoring Point at Hnan Ywa Village (ASR3) Lat- 21°22’17.407”, Long- 95°23’18.450” 11.9.2019 to 12.9.2019	

Air Monitoring Point at Gyoke Pin Village (ASR5) Lat- 21°24’21.888”, Long- 95°21’07.381” 12.9.2019 to 13.9.2019	
Air Monitoring Point at Nyaung Kan Village (ASR14) Lat- 21°21’58.342”, Long- 95°20’51.254” 13.9.2019 to 14.9.2019	

Sembcorp Myingyan Power Co., Ltd.

Environmental Monitoring Report

(Air Quality Monitoring)

Prepared by

Ref: 9.12.2019 to 13.12.2019 (Air Quality Report)

07 January 2020

E Guard Environmental Services

Table of Contents

List of Figures

List of Tables

1. INTRODUCTION

This report is environmental monitoring (only air and noise quality monitoring) for Sembcorp Myingyan Power Plant which is located beside of Myingyan – Nyaung-Oo Road, near the Sa Ka village in Mandalay Region.

2. METHODOLOGY

Baseline environmental parameters and sampling locations were defined according to the objectives for environmental monitoring purposes. Locations for sampling and analysis of ambient air quality of the project site were identified by Sembcorp Myingyan Power Co,ltd.

2.1 Ambient Air Quality

The emissions of dust particles and gases were measured for 24hrs continuously at the selected sites by using the Environmental Perimeter Air Station (EPAS), and EPAS provides direct readings in real time with data-logging capabilities. The monitoring results were compared with National Environmental Quality (Emission) Guideline (NEQG), World Health Organization (WHO) and American Conference of Governmental Industrial Hygienists (ACGIH) guidelines.

Table 2. 1 Ambient Air Quality Parameters

Ambient Air Quality (4 locations)	
Gas Emission	CO, CO_2, SO_2, NO_2
Dust Emission	PM_{10}, $PM_{2.5}$

Table 2. 2 Air Quality Guideline Values

Parameters	Guidelines Value	Unit	Organization	Averaging Period
PM_{10}	50	$\mu g/m^3$	NEQ	24hrs
$PM_{2.5}$	25	$\mu g/m^3$	NEQ	24hrs
CO	9	ppm	NAAQS	8hrs
CO_2	5000	ppm	ACGIH	8hrs
SO_2	20	$\mu g/m^3$	NEQ	24hrs
NO_2	200	$\mu g/m^3$	NEQ	1hrs

Source: Myanmar National Environmental Quality (Emission) Guidelines, December 2015 & Air quality guidelines global update. 2005. World Health Organization.

2.2 Ambient Noise

Noise level LAeq (dBA) will be measured at the selected locations that can reflect the exposure of the nearest local community and sensitive locations. Duration and frequency were measured for 24hrs continuously at the selected site using the Noise Meter.

The monitoring procedures, data analysis and interpretation were carried out in accordance with the instrument's manufacture and National Environmental Quality (Emission) Guidelines, World Health Organization (WHO) and International Finance Corporation (IFC guidelines in order to be in line with Environmental Conservation Department, Ministry of Natural

Resources and Environment Conservation (MONREC). "National Environmental Quality (Emission) Guidelines" for Myanmar was also presented the value of noise level as LAeq (dBA).

Table 2. 3 Noise level monitoring

Noise monitoring (2 locations)	
Noise Emission	LAeq (dBA) (1hrs, 24 hrs.)

Equipment used to measure ambient air and noise measurement are shown below (**Table 2. 4**)

Table 2. 4 Equipment used to measure ambient air and noise measurement

Davis Vantage Pro2 Wireless Weather Station Provides detailed current weather conditions and expanded forecasts - all at a glance! The Vantage Pro2 uses a frequency-hopping spread spectrum radio from 902 MHz to 928 MHz to transmit and receive data up to 1,000' (300m) line of sight. In addition, the weather station features a bubble level, improved anemometer base, redesigned wind cups, and factory-calibrated wind direction. The integrated sensor suite combines temperature and humidity sensors, rain collector with an aluminum-plated tipping bucket, and anemometer into one package for easy setup. Measure inside and outside temperature and humidity, heat index, barometric pressure, dew point, rainfall, wind direction and speed, and wind chill.	
Haz-Scanner EPAS PM_{10}, PM $_{2.5}$, NO_2, SO_2, CO, CO_2, Temperature, and Relative Humidity	
Digital Sound Level Meter Noise and Vibration	

3. MONITORING LOCATIONS

Locations of sampling sites were identified by Sembcorp Myingyan Power Co,ltd. Air quality was monitored at the four selected locations that are Sa Ka Village (ASR4), Hnan Ywa Village (ASR3), Gyoke Pin Village (ASR 5) and Nyaung Kan Village (ASR 14).

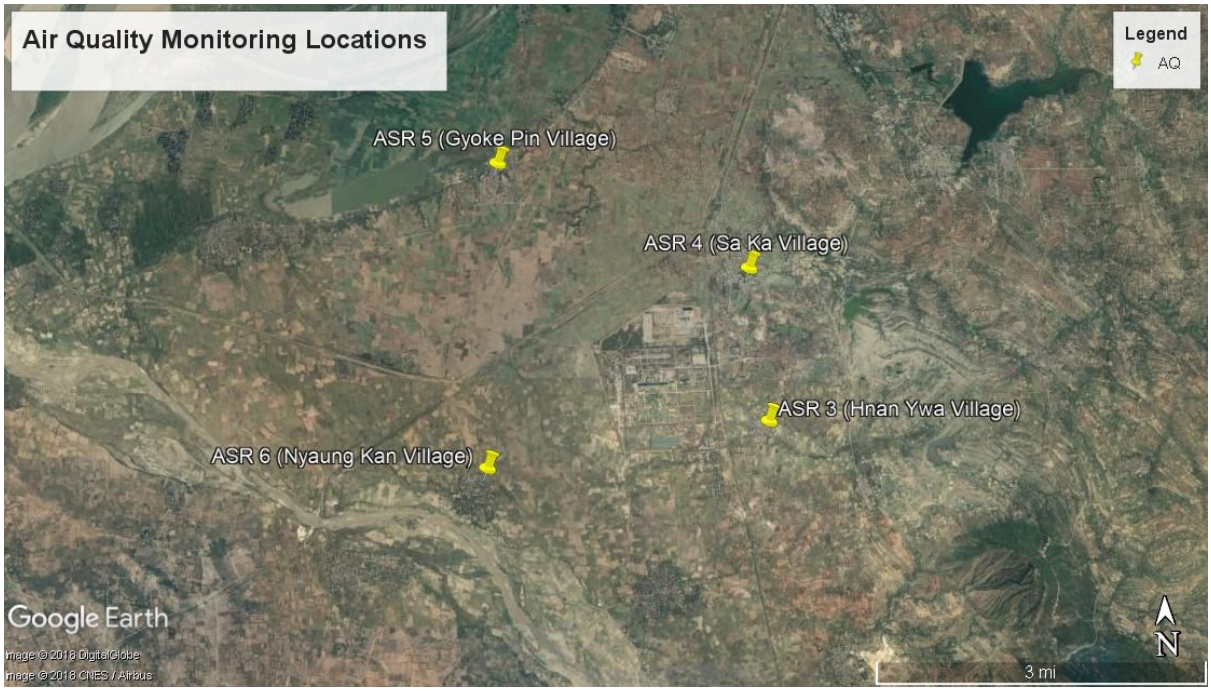

Figure 3. 1 Location of Monitoring Points

Table 3. 1 Location of Monitoring Points

Locations No.	Points	Coordinate	Locations
Ambient Air Quality and Noise Monitoring Locations			
1	ASR4	Lat- 21°23’48.460”, Long- 95°23’02.530”	Sa Ka Village
2	ASR3	Lat- 21°22’18.130”, Long- 95°23’17.110”	Hnan Ywa Village
3	ASR5	Lat- 21°24’22.128”, Long- 95°21’7.386”	Gyoke Pin Village
4	ASR14	Lat- 21°21’58.181”, Long- 95°20’51.453”	Nyaung Kan Village

4. ENVIRONMENTAL QUALITY MONITORING RESULTS

4.1 Ambient Air Quality Monitoring Results

24 hours air quality monitoring were done at each selected location from 9 December 2019 to 13 December 2019. The measured results are compared with national emission guidelines. Based on the results of air quality monitoring, most of the parameters are within the guidelines.

Table 4. 1 Observed Ambient Air Quality Results from Selected Points

Parameters	Observed Value				Guidelines Value	Unit	Averaging Period
	ASR4	ASR3	ASR5	ASR14			
PM_{10}	22.72	29.70	25.15	25.54	50	$\mu g/m^3$	24hrs
$PM_{2.5}$	13.53	14.26	15.43	15.72	25	$\mu g/m^3$	24hrs
CO	0.01	0.00	0.00	0.00	9	ppm	8hrs
CO_2	308.04	323.86	333.63	325.19	5000	ppm	8hrs
SO_2	0.00	0.00	0.00	0.00	20	$\mu g/m^3$	24hrs
NO_2	57.97	68.62	28.04	11.12	200	$\mu g/m^3$	1hrs

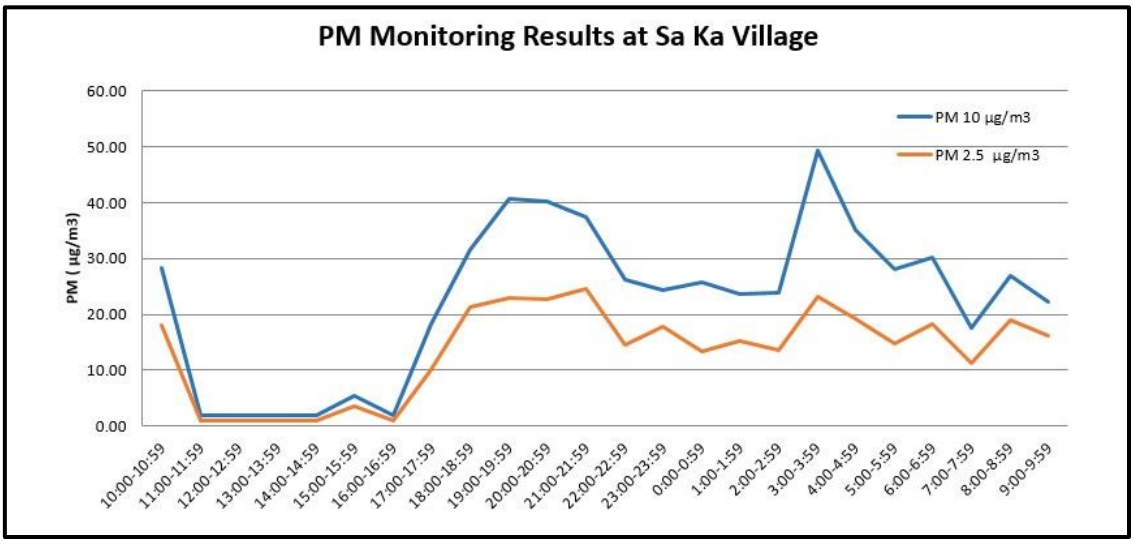

Figure 4. 1 PM Monitoring Results at Sa Ka Village

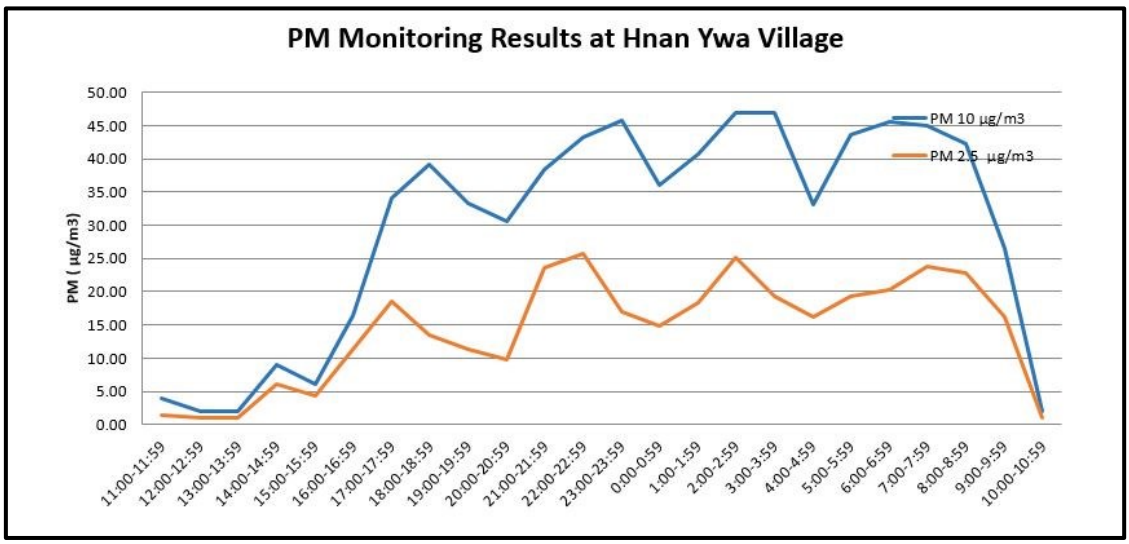

Figure 4. 2 PM Monitoring Results at Hnan Ywa Village

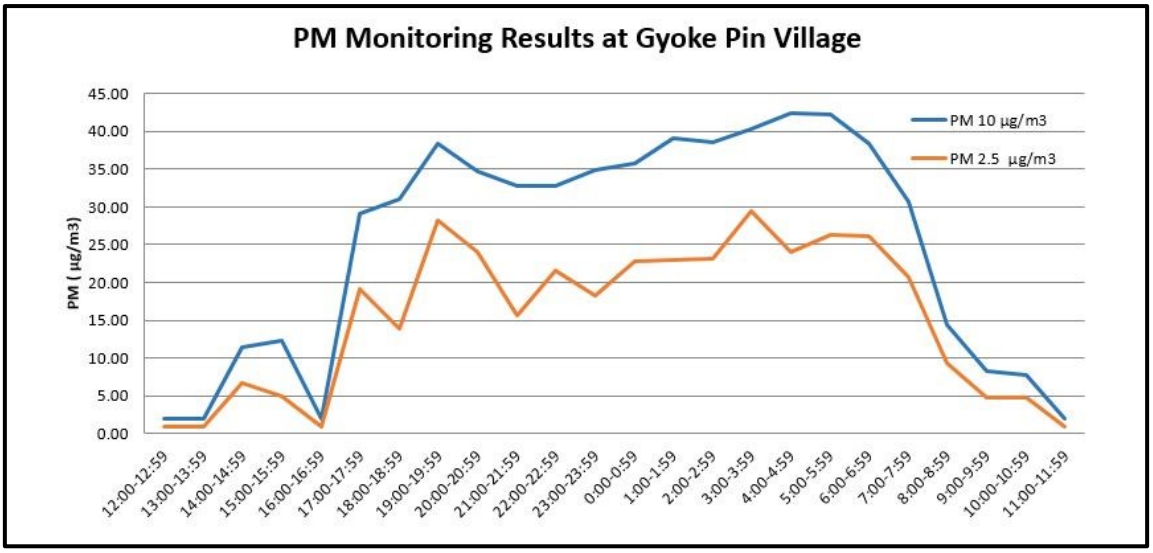

Figure 4. 3 PM Monitoring Results at Gyoke Pin Village

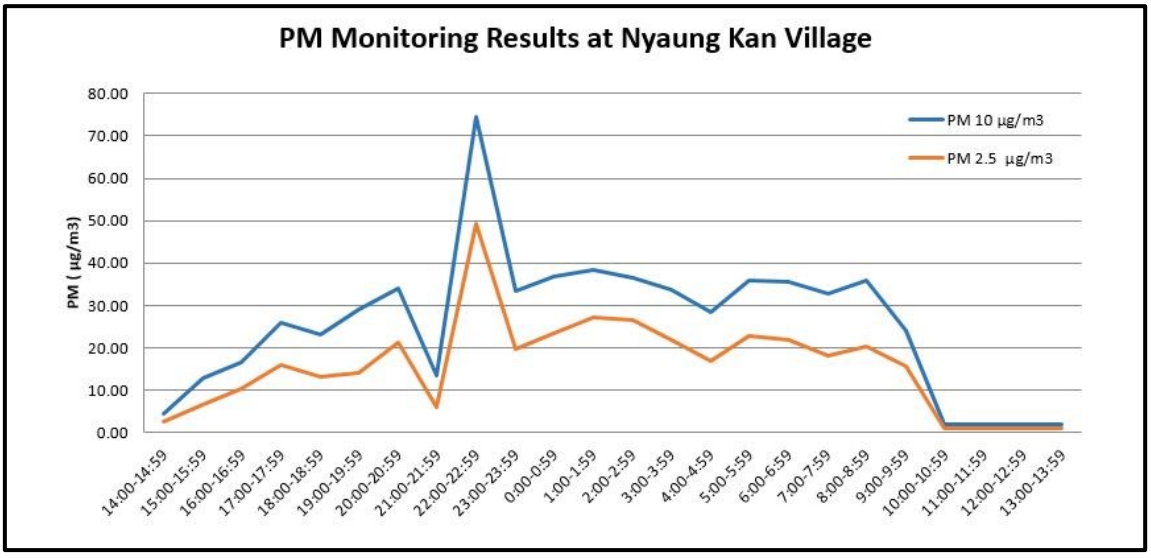

Figure 4. 4 PM Monitoring Results at Nyaung Kan Village

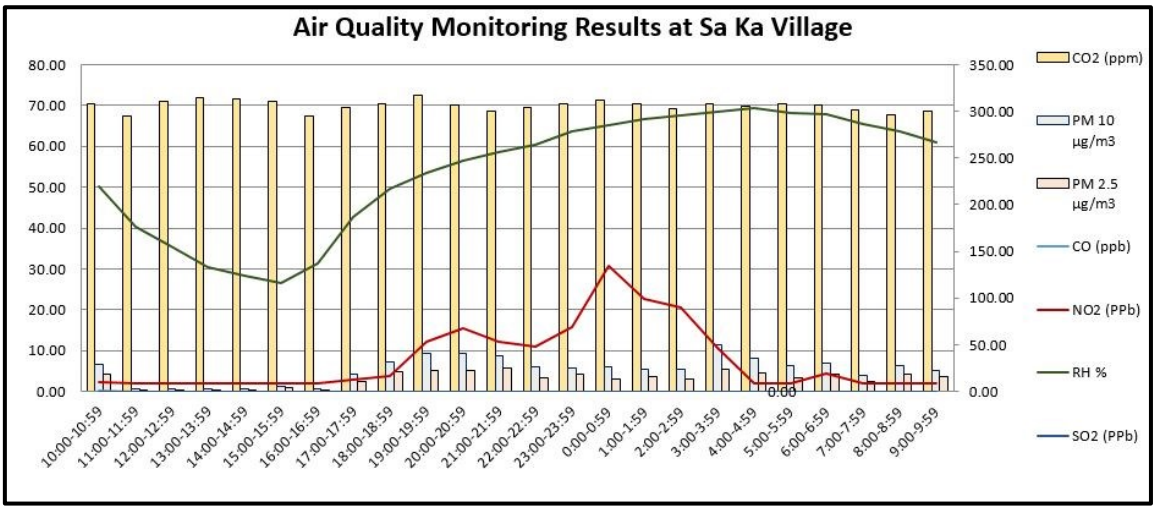

Figure 4. 5 Fluctuation of Air Pollutants during dial cycle (Sa Ka Village)

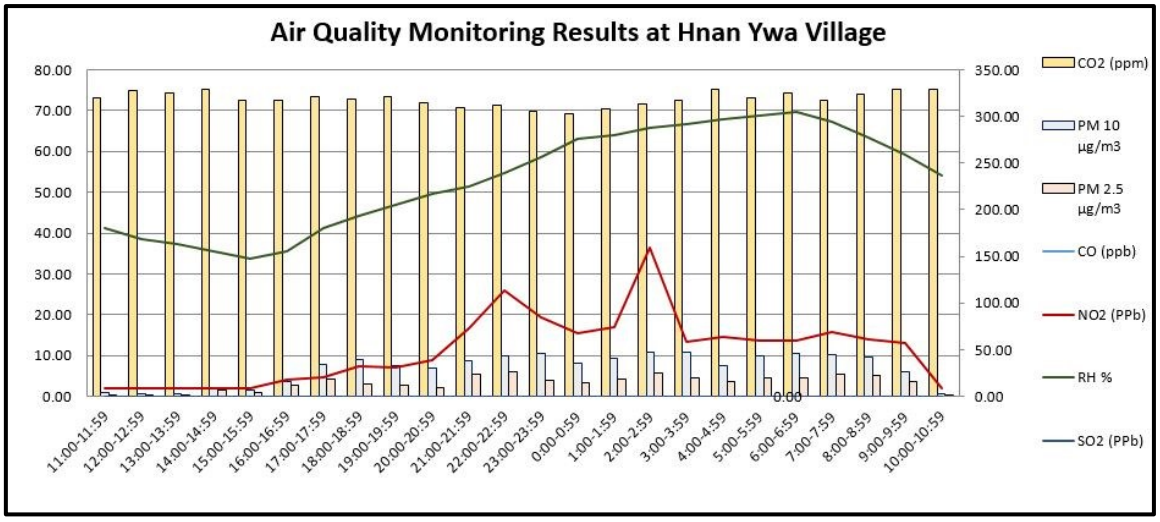

Figure 4. 6 Fluctuation of Air Pollutants during dial cycle (Hnan Ywa Village)

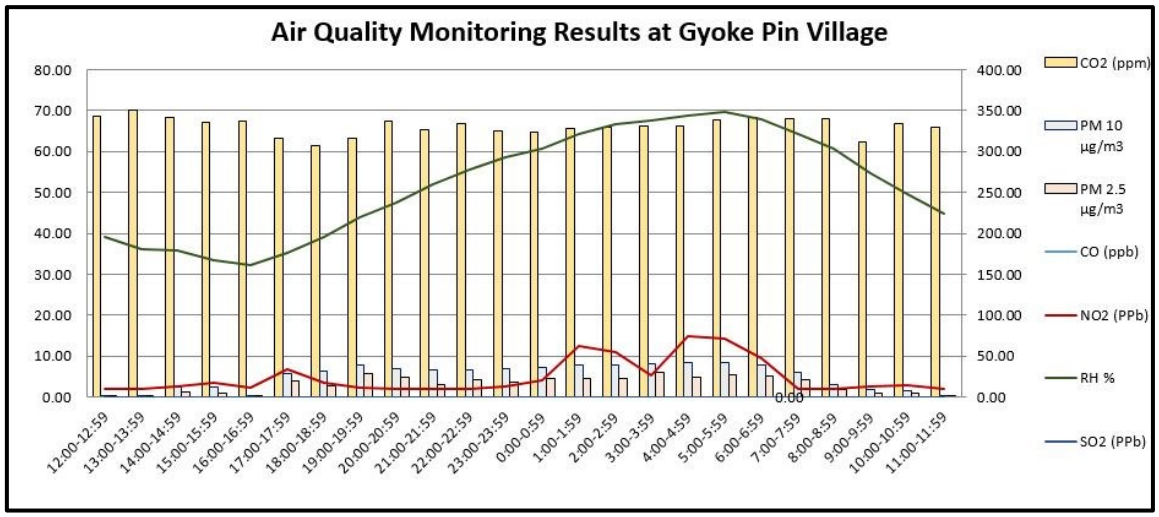

Figure 4. 7 Fluctuation of Air Pollutants during dial cycle (Gyoke Pin Village)

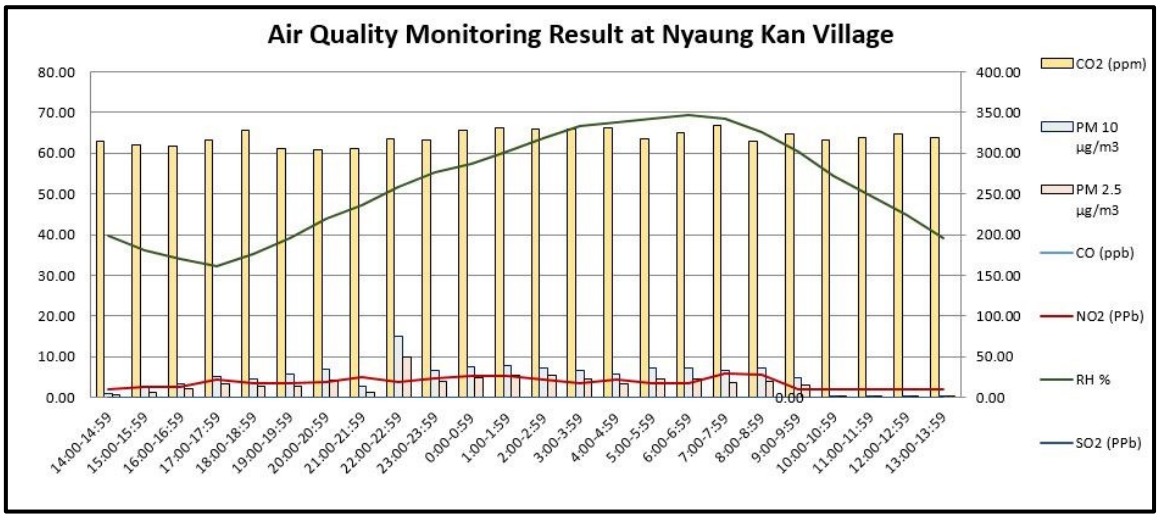

Figure 4. 8 Fluctuation of Air Pollutants during dial cycle (Nyaung Kan Village)

Detail results with one-hour interval of pollutants are shown in **Table 4. 2** to

11.12.2019	12:00-12:59	Average	342.97	0.00	2.00	2
11.12.2019	13:00-13:59	Average	351.35	0.00	2.00	2
11.12.2019	14:00-14:59	Average	342.20	0.00	2.50	11
11.12.2019	15:00-15:59	Average	334.98	0.00	3.33	12
11.12.2019	16:00-16:59	Average	336.73	0.00	2.25	2
11.12.2019	17:00-17:59	Average	316.80	0.00	6.83	29
11.12.2019	18:00-18:59	Average	307.17	0.00	3.33	31
11.12.2019	19:00-19:59	Average	315.92	0.00	2.17	38
11.12.2019	20:00-20:59	Average	337.85	0.00	2.00	34
11.12.2019	21:00-21:59	Average	326.18	0.00	2.00	32
11.12.2019	22:00-22:59	Average	334.43	0.00	2.00	32
11.12.2019	23:00-23:59	Average	325.13	0.01	2.42	34
12.12.2019	0:00-0:59	Average	323.27	0.00	3.92	35
12.12.2019	1:00-1:59	Average	327.65	0.00	12.33	39
12.12.2019	2:00-2:59	Average	330.43	0.00	11.00	38
12.12.2019	3:00-3:59	Average	331.48	0.00	5.17	40
12.12.2019	4:00-4:59	Average	330.82	0.00	14.92	42
12.12.2019	5:00-5:59	Average	339.42	0.00	14.25	42
12.12.2019	6:00-6:59	Average	342.13	0.00	9.50	38
12.12.2019	7:00-7:59	Average	339.92	0.00	2.00	30
12.12.2019	8:00-8:59	Average	340.48	0.00	2.00	14
12.12.2019	9:00-9:59	Average	311.95	0.00	2.58	8
12.12.2019	10:00-10:59	Average	334.58	0.00	2.83	7
12.12.2019	11:00-11:59	Average	329.72	0.00	2.00	2
Average			331.40	0.00	4.81	25
1 hour Minimum			307.17	0.00	2.00	2
1 hour Maximum			351.35	0.01	14.92	42

Table 4. 5. All results are under the Myanmar National Environmental Quality (emission) Guidelines. So, Sembcorp Myingyan Power Plant is acceptable for environment.

Table 4. 2 Air Monitoring Results (Sa Ka Village)

Date	Time		CO_2 (ppm)	CO (ppb)	NO_2 (ppb)	PM_{10} µg/m^3	$PM_{2.5}$ µg/m^3	RH %	SO_2 (ppb)
9.12.2019	10:00-10:59	Average	308.08	0.05	2.33	28.42	18.08	50.33	0.00
9.12.2019	11:00-11:59	Average	295.32	0.00	2.00	2.00	1.00	40.33	0.00
9.12.2019	12:00-12:59	Average	311.32	0.00	2.00	2.00	1.00	35.42	0.00
9.12.2019	13:00-13:59	Average	314.78	0.00	2.00	2.00	1.00	30.50	0.00
9.12.2019	14:00-14:59	Average	313.13	0.00	2.00	2.00	1.00	28.42	0.00
9.12.2019	15:00-15:59	Average	311.20	0.00	2.00	5.42	3.50	26.58	0.00
9.12.2019	16:00-16:59	Average	295.22	0.00	2.00	2.00	1.00	31.42	0.00
9.12.2019	17:00-17:59	Average	304.43	0.00	3.00	18.25	10.17	42.83	0.00
9.12.2019	18:00-18:59	Average	307.73	0.00	3.75	31.50	21.33	49.50	0.00
9.12.2019	19:00-19:59	Average	316.87	0.00	12.08	40.75	22.83	53.58	0.00
9.12.2019	20:00-20:59	Average	307.50	0.00	15.50	40.25	22.75	56.58	0.00
9.12.2019	21:00-21:59	Average	300.87	0.00	12.17	37.42	24.58	58.58	0.00
9.12.2019	22:00-22:59	Average	303.98	0.00	10.83	26.17	14.58	60.50	0.00
9.12.2019	23:00-23:59	Average	307.87	0.00	15.83	24.33	17.92	63.67	0.00
10.12.2019	0:00-0:59	Average	311.75	0.00	30.83	25.83	13.42	65.33	0.00
10.12.2019	1:00-1:59	Average	307.75	0.00	22.75	23.75	15.33	66.67	0.00
10.12.2019	2:00-2:59	Average	302.37	0.00	20.58	23.92	13.67	67.67	0.00
10.12.2019	3:00-3:59	Average	308.07	0.00	10.67	49.33	23.25	68.58	0.00
10.12.2019	4:00-4:59	Average	305.95	0.00	2.00	35.08	19.25	69.42	0.00
10.12.2019	5:00-5:59	Average	307.70	0.00	2.00	28.17	14.67	68.33	0.00
10.12.2019	6:00-6:59	Average	306.95	0.00	4.25	30.17	18.25	67.75	0.00
10.12.2019	7:00-7:59	Average	301.88	0.00	2.00	17.50	11.17	65.58	0.00
10.12.2019	8:00-8:59	Average	296.25	0.00	2.00	26.92	18.92	63.58	0.00
10.12.2019	9:00-9:59	Average	300.20	0.00	2.00	22.17	16.17	61.08	0.00
Average			306.13	0.00	7.77	22.72	13.53	53.84	0.00
1 hour Minimum			295.22	0.00	2.00	2.00	1.00	26.58	0.00
1 hour Maximum			316.87	0.05	30.83	49.33	24.58	69.42	0.00

Table 4. 3 Air Monitoring Results (Hnan Ywa Village)

Date	Time		CO_2 (ppm)	CO (ppb)	NO_2 (ppb)	PM_{10} µg/m^3	$PM_{2.5}$ µg/m^3	RH %	SO_2 (ppb)
10.12.2019	11:00-11:59	Average	320.43	0.00	2.00	4.00	1.50	41.33	0.00
10.12.2019	12:00-12:59	Average	328.22	0.00	2.00	2.00	1.00	38.67	0.00
10.12.2019	13:00-13:59	Average	325.05	0.00	2.00	2.00	1.00	37.42	0.00
10.12.2019	14:00-14:59	Average	329.47	0.00	2.00	8.92	6.17	35.67	0.00
10.12.2019	15:00-15:59	Average	317.58	0.00	2.00	6.08	4.33	33.83	0.00
10.12.2019	16:00-16:59	Average	316.93	0.00	4.00	16.42	11.25	35.67	0.00
10.12.2019	17:00-17:59	Average	321.57	0.00	4.58	34.17	18.58	41.25	0.00
10.12.2019	18:00-18:59	Average	318.03	0.00	7.33	39.08	13.50	44.08	0.00
10.12.2019	19:00-19:59	Average	321.58	0.00	7.00	33.33	11.42	46.83	0.00
10.12.2019	20:00-20:59	Average	314.40	0.00	8.75	30.67	9.83	49.58	0.00
10.12.2019	21:00-21:59	Average	308.92	0.00	16.50	38.33	23.67	51.33	0.00
10.12.2019	22:00-22:59	Average	312.12	0.00	25.92	43.25	25.75	54.67	0.00
10.12.2019	23:00-23:59	Average	305.48	0.00	19.25	45.75	16.92	58.50	0.00
11.12.2019	0:00-0:59	Average	303.30	0.00	15.50	36.08	14.92	63.08	0.00
11.12.2019	1:00-1:59	Average	308.75	0.00	17.00	40.75	18.33	64.08	0.00
11.12.2019	2:00-2:59	Average	313.18	0.00	36.50	46.92	25.17	65.67	0.00
11.12.2019	3:00-3:59	Average	316.98	0.00	13.25	46.92	19.25	66.83	0.00
11.12.2019	4:00-4:59	Average	329.02	0.00	14.42	33.08	16.25	67.75	0.00
11.12.2019	5:00-5:59	Average	319.93	0.00	13.58	43.58	19.25	68.83	0.00
11.12.2019	6:00-6:59	Average	324.88	0.00	13.58	45.58	20.33	69.58	0.00
11.12.2019	7:00-7:59	Average	317.25	0.00	15.67	45.08	23.75	67.33	0.00
11.12.2019	8:00-8:59	Average	324.18	0.00	13.92	42.27	22.83	63.42	0.00
11.12.2019	9:00-9:59	Average	329.52	0.00	13.17	26.42	16.25	59.17	0.00
11.12.2019	10:00-10:59	Average	329.13	0.00	2.00	2.00	1.00	54.08	0.00
Average			319.00	0.00	11.33	29.70	14.26	53.28	0.00
1 hour Minimum			303.30	0.00	2.00	2.00	1.00	33.83	0.00
1 hour Maximum			329.52	0.00	36.50	46.92	25.75	69.58	0.00

Table 4. 4 Air Monitoring Results (Gyoke Pin Village)

Date	Time		CO_2 (ppm)	CO (ppb)	NO_2 (ppb)	PM_{10} µg/m^3	$PM_{2.5}$ µg/m^3	RH %	SO_2 (ppb)
11.12.2019	12:00-12:59	Average	342.97	0.00	2.00	2.00	1.00	39.25	0.00
11.12.2019	13:00-13:59	Average	351.35	0.00	2.00	2.00	1.00	36.17	0.00
11.12.2019	14:00-14:59	Average	342.20	0.00	2.50	11.42	6.67	35.75	0.00
11.12.2019	15:00-15:59	Average	334.98	0.00	3.33	12.33	5.00	33.50	0.00
11.12.2019	16:00-16:59	Average	336.73	0.00	2.25	2.00	1.00	32.17	0.00
11.12.2019	17:00-17:59	Average	316.80	0.00	6.83	29.08	19.17	35.33	0.00
11.12.2019	18:00-18:59	Average	307.17	0.00	3.33	31.08	13.92	39.17	0.00
11.12.2019	19:00-19:59	Average	315.92	0.00	2.17	38.42	28.17	43.92	0.00
11.12.2019	20:00-20:59	Average	337.85	0.00	2.00	34.75	24.00	47.42	0.00
11.12.2019	21:00-21:59	Average	326.18	0.00	2.00	32.83	15.58	52.08	0.00
11.12.2019	22:00-22:59	Average	334.43	0.00	2.00	32.75	21.50	55.75	0.00
11.12.2019	23:00-23:59	Average	325.13	0.01	2.42	34.83	18.33	58.50	0.00
12.12.2019	0:00-0:59	Average	323.27	0.00	3.92	35.83	22.75	60.75	0.00
12.12.2019	1:00-1:59	Average	327.65	0.00	12.33	39.08	22.92	64.17	0.00
12.12.2019	2:00-2:59	Average	330.43	0.00	11.00	38.58	23.08	66.67	0.00
12.12.2019	3:00-3:59	Average	331.48	0.00	5.17	40.25	29.42	67.67	0.00
12.12.2019	4:00-4:59	Average	330.82	0.00	14.92	42.42	24.08	68.75	0.00
12.12.2019	5:00-5:59	Average	339.42	0.00	14.25	42.25	26.33	69.67	0.00
12.12.2019	6:00-6:59	Average	342.13	0.00	9.50	38.33	26.08	67.92	0.00
12.12.2019	7:00-7:59	Average	339.92	0.00	2.00	30.75	20.67	64.25	0.00
12.12.2019	8:00-8:59	Average	340.48	0.00	2.00	14.42	9.25	60.58	0.00
12.12.2019	9:00-9:59	Average	311.95	0.00	2.58	8.33	4.75	54.67	0.00
12.12.2019	10:00-10:59	Average	334.58	0.00	2.83	7.75	4.75	49.75	0.00
12.12.2019	11:00-11:59	Average	329.72	0.00	2.00	2.00	1.00	44.92	0.00
Average			331.40	0.00	4.81	25.15	15.43	52.03	0.00
1 hour Minimum			307.17	0.00	2.00	2.00	1.00	32.17	0.00
1 hour Maximum			351.35	0.01	14.92	42.42	29.42	69.67	0.00

Table 4. 5 Air Monitoring Results (Nyaung Kan Village)

Date	Time		CO_2 (ppm)	CO (ppb)	NO_2 (ppb)	PM_{10} µg/m3	$PM_{2.5}$ µg/m3	RH %	SO_2 (ppb)
12.12.2019	14:00-14:59	Average	315.45	0.00	2.00	4.50	2.50	39.58	0.00
12.12.2019	15:00-15:59	Average	310.90	0.00	2.50	13.00	6.58	36.17	0.00
12.12.2019	16:00-16:59	Average	308.38	0.00	2.58	16.67	10.42	33.92	0.00
12.12.2019	17:00-17:59	Average	316.42	0.00	4.33	25.92	15.83	32.33	0.00
12.12.2019	18:00-18:59	Average	328.37	0.00	3.50	23.08	13.17	35.33	0.00
12.12.2019	19:00-19:59	Average	305.90	0.00	3.33	29.17	14.17	39.17	0.00
12.12.2019	20:00-20:59	Average	304.98	0.00	3.67	33.92	21.17	43.92	0.00
12.12.2019	21:00-21:59	Average	306.27	0.00	5.08	13.42	6.08	47.08	0.00
12.12.2019	22:00-22:59	Average	318.30	0.00	3.67	74.58	49.17	51.67	0.00
12.12.2019	23:00-23:59	Average	316.05	0.00	4.75	33.33	19.67	55.17	0.00
13.12.2019	0:00-0:59	Average	328.43	0.00	5.33	36.75	23.33	57.50	0.00
13.12.2019	1:00-1:59	Average	330.73	0.00	5.33	38.50	27.17	60.25	0.00
13.12.2019	2:00-2:59	Average	329.95	0.00	4.33	36.42	26.67	63.83	0.00
13.12.2019	3:00-3:59	Average	329.63	0.00	3.33	33.58	22.00	66.67	0.00
13.12.2019	4:00-4:59	Average	330.48	0.00	4.42	28.33	16.75	67.67	0.00
13.12.2019	5:00-5:59	Average	317.95	0.00	3.42	35.92	22.92	68.42	0.00
13.12.2019	6:00-6:59	Average	325.48	0.00	3.50	35.58	21.92	69.25	0.00
13.12.2019	7:00-7:59	Average	334.67	0.00	5.92	32.67	18.17	68.42	0.00
13.12.2019	8:00-8:59	Average	315.23	0.00	5.50	35.75	20.17	65.25	0.00
13.12.2019	9:00-9:59	Average	323.23	0.00	2.00	23.92	15.50	60.42	0.00
13.12.2019	10:00-10:59	Average	316.88	0.00	2.00	2.00	1.00	54.33	0.00
13.12.2019	11:00-11:59	Average	319.32	0.00	2.00	2.00	1.00	49.67	0.00
13.12.2019	12:00-12:59	Average	322.98	0.00	2.00	2.00	1.00	44.83	0.00
13.12.2019	13:00-13:59	Average	318.87	0.00	2.00	2.00	1.00	39.25	0.00
Average			319.79	0.00	3.60	25.54	15.72	52.09	0.00
1 hour Minimum			304.98	0.00	2.00	2.00	1.00	32.33	0.00
1 hour Maximum			334.67	0.00	5.92	74.58	49.17	69.25	0.00

4.2 Wind Speed and Direction

The following figure describes the wind speed and wind direction of the proposed project site on, 10 to 14 September 2019 respectively. According to the data, the wind direction is following **Figure 4. 9 to Figure 4. 16.**

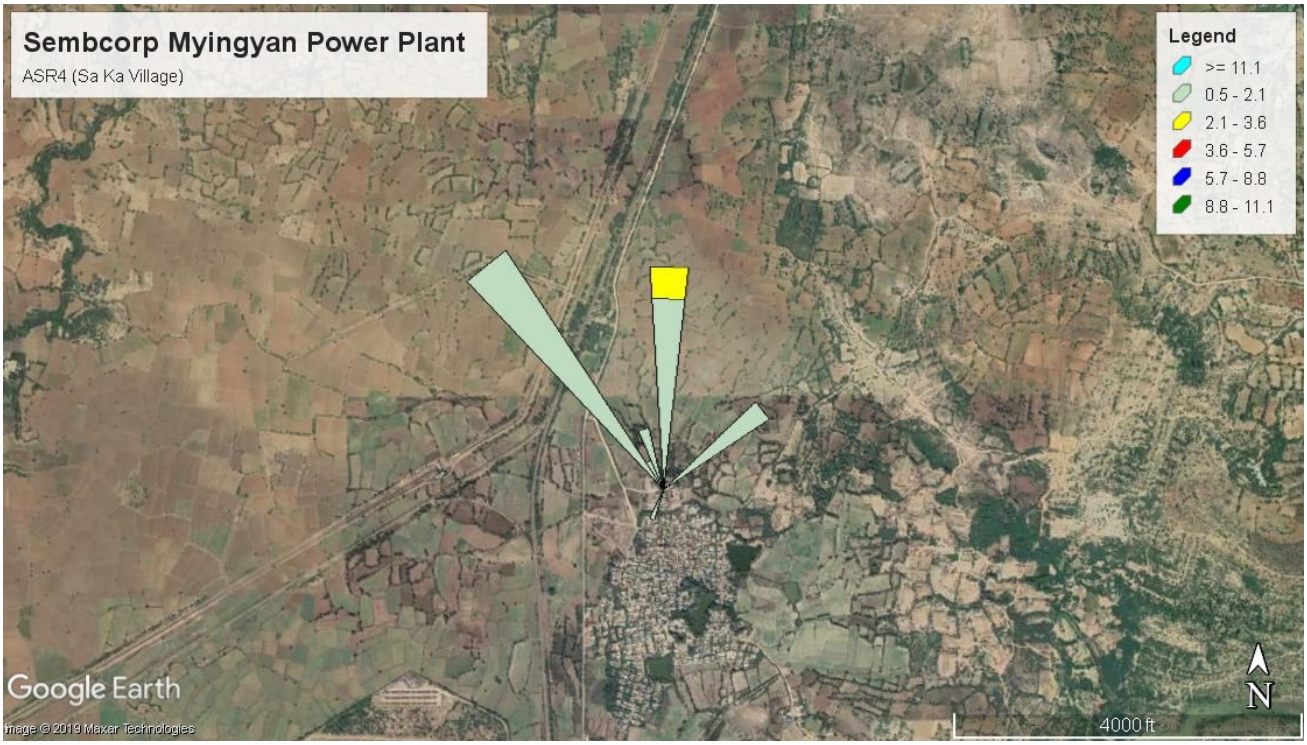

Figure 4. 9 Wind Speed and Wind Direction (Blowing From) at Sa Ka Village (ASR4)

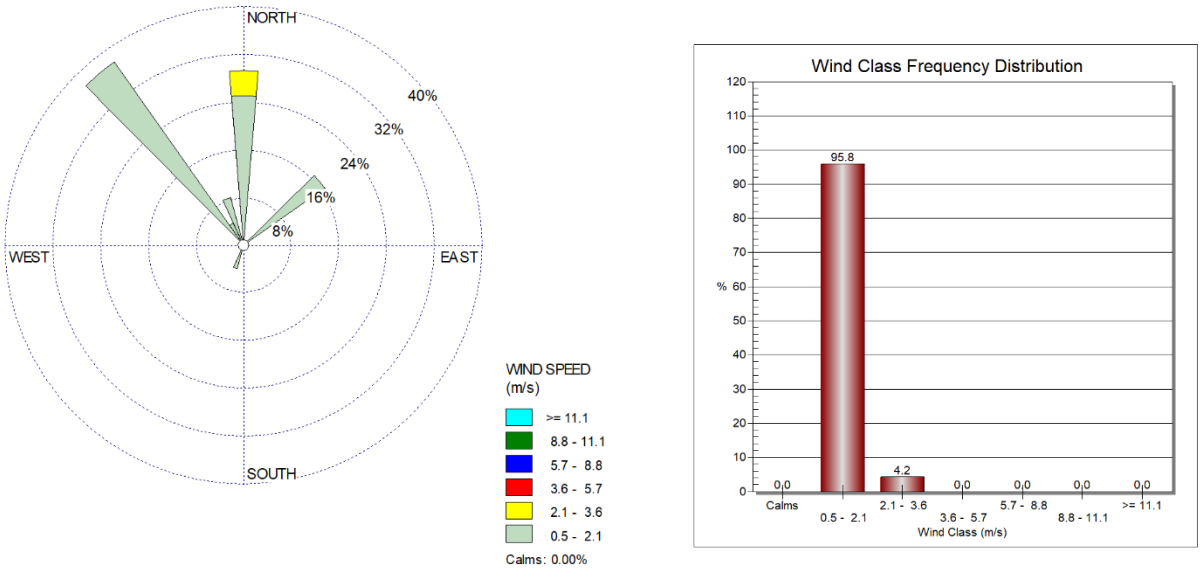

Figure 4. 10 Wind Class Frequency Distribution at Sa Ka Village (ASR4)

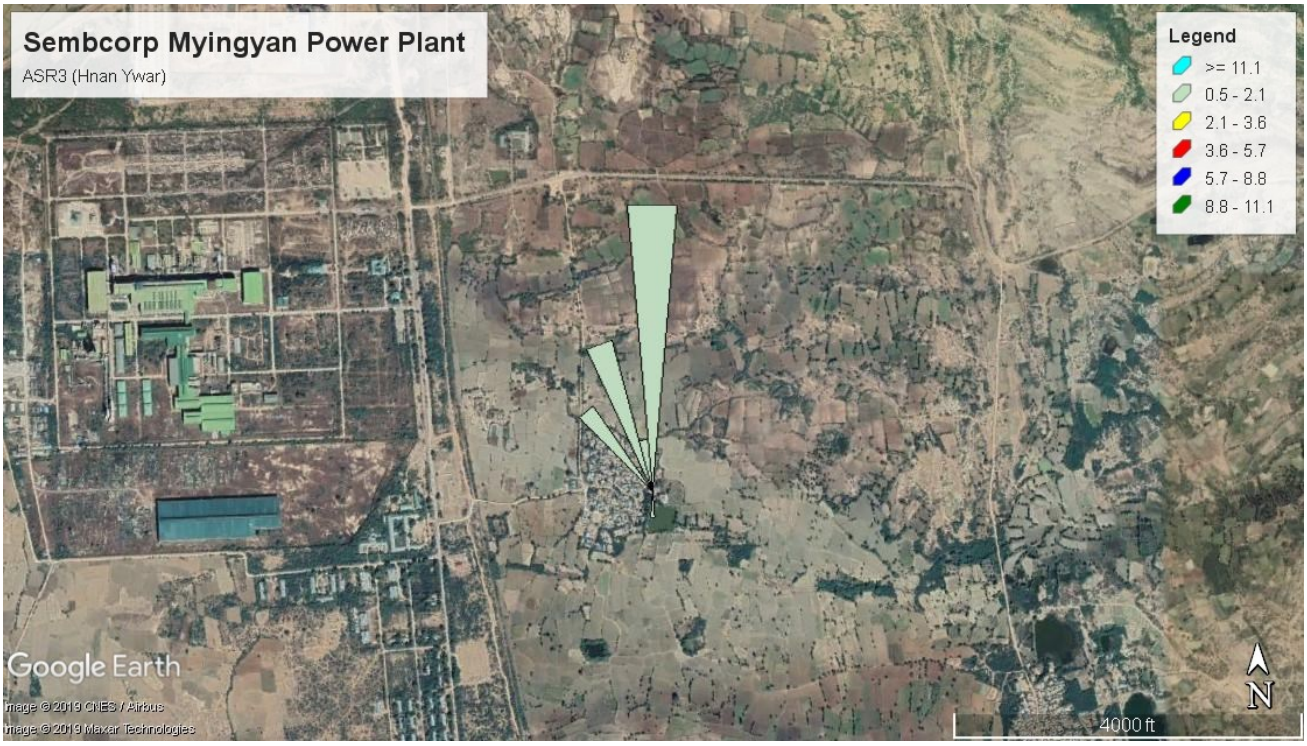

Figure 4. 11 Wind Speed and Wind Direction (Blowing From) at Hnan Ywa Village (ASR3)

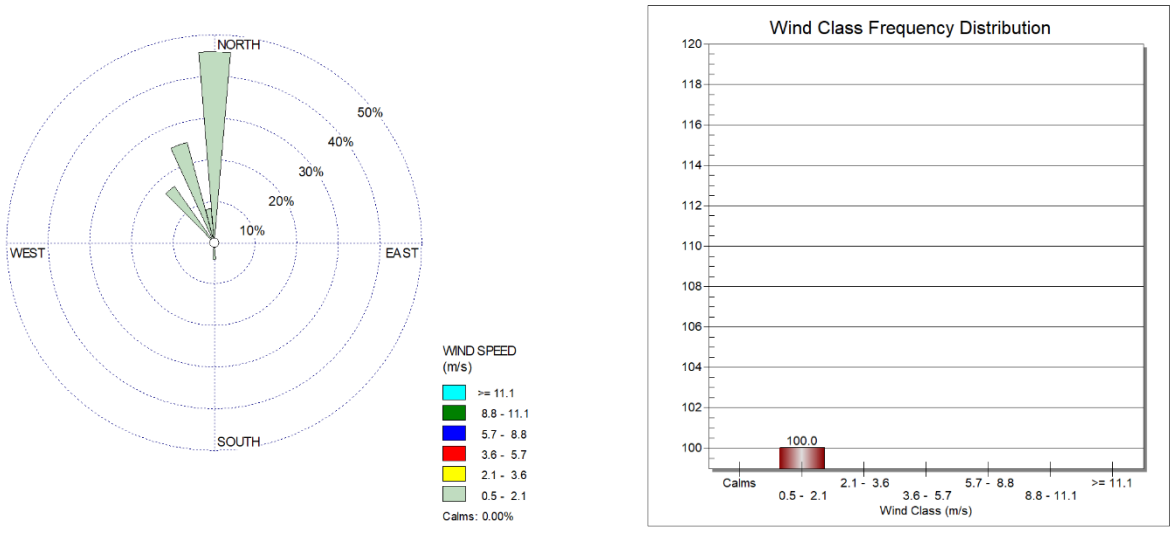

Figure 4. 12 Wind Class Frequency Distribution at Hnan Ywa Village (ASR3)

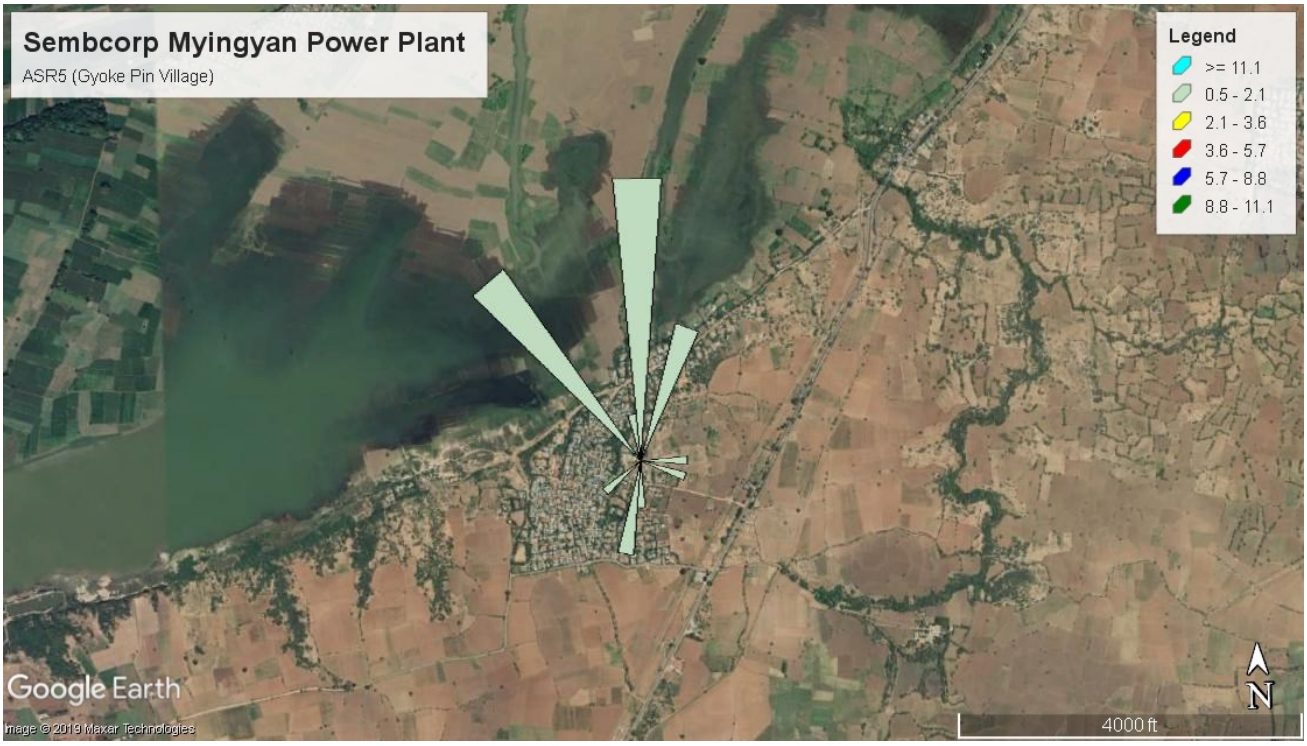

Figure 4. 13 Wind Speed and Wind Direction (Blowing From) at Gyoke Pin Village (ASR5)

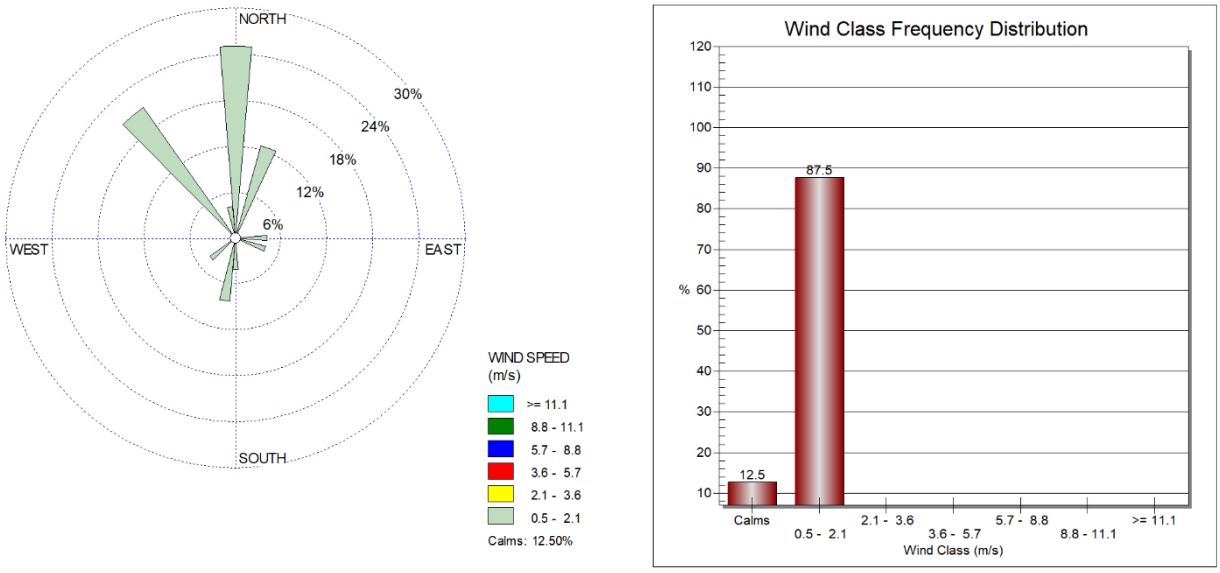

Figure 4. 14 Wind Class Frequency Distribution at Gyoke Pin Village (ASR5)

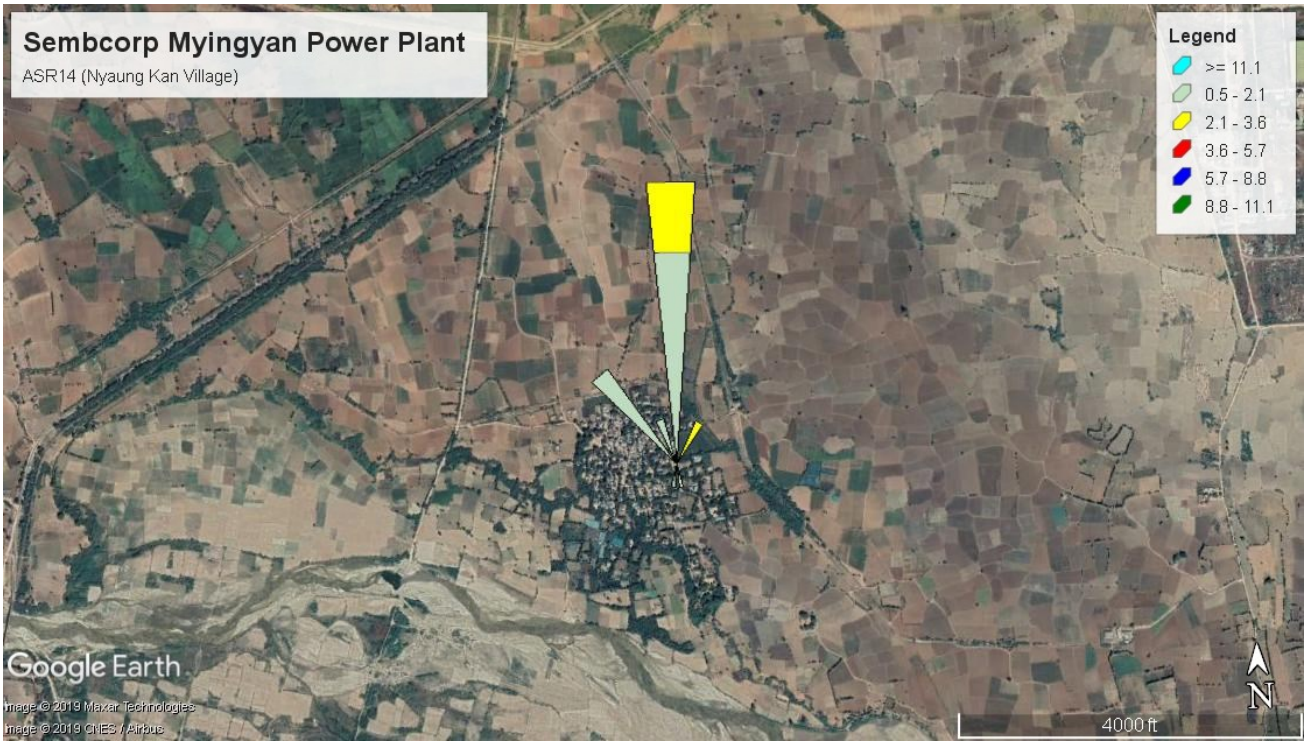

Figure 4. 15 Wind Speed and Wind Direction (Blowing From) at Nyaung Kan Village (ASR14)

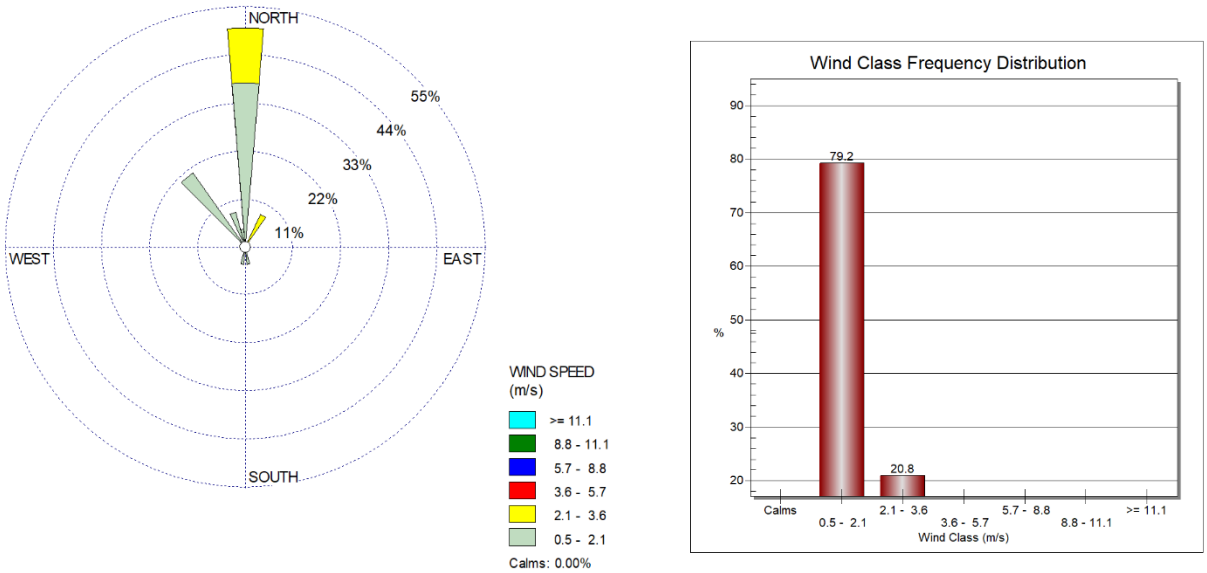

Figure 4. 16 Wind Class Frequency Distribution at Nyaung Kan Village (ASR14)

4.3 Ambient Noise

Ambient noise level for the proposed project was measured with Digital Sound Level Meter at the project site. The noise level measurement is conducted at sembcorp myingyan power points: these points are nearly sembcop myingyan power plant and air monitoring point at sa ka village on 9 to 11 December 2019. Measuring period is 24 hours continuously. The observed values are described in **Table 4. 6 to Table 4. 9** and the following figures are noise level measurement at the proposed project.

Table 4. 6 Observed Values of Noise Level Measurement at near Sembcorp Myingyan Power Plant

No.	Date	Time	Observed Mean Value (Source)	Weight	Day/Night	Average
1	11.12.2019	7:00:13-7:59:13	56.14	A	Day	55.48
2	11.12.2019	8:00:13-8:59:13	56.05	A	Day	
3	10.12.2019	9:00:13-9:59:13	52.37	A	Day	
4	10.12.2019	10:00:13-10:59:13	55.11	A	Day	
5	10.12.2019	11:00:13-11:59:13	56.03	A	Day	
6	10.12.2019	12:00:13-12:59:13	55.49	A	Day	
7	10.12.2019	13:00:13-13:59:13	55.81	A	Day	
8	10.12.2019	14:00:13-14:59:13	55.47	A	Day	
9	10.12.2019	15:00:13-15:59:13	56.12	A	Day	
10	10.12.2019	16:00:13-16:59:13	57.42	A	Day	
11	10.12.2019	17:00:13-17:59:13	56.79	A	Day	
12	10.12.2019	18:00:13-18:59:13	52.21	A	Day	
13	10.12.2019	19:00:13-19:59:13	55.65	A	Day	
14	10.12.2019	20:00:13-20:59:13	55.81	A	Day	
15	10.12.2019	21:00:13-21:59:13	55.67	A	Day	
16	10.12.2019	22:00:13-22:59:13	55.62	A	Night	55.28
17	10.12.2019	23:00:13-23:59:13	55.39	A	Night	
18	11.12.2019	0:00:13-0:59:13	56.18	A	Night	
19	11.12.2019	1:00:13-1:59:13	57.85	A	Night	
20	11.12.2019	2:00:13-2:59:13	52.79	A	Night	
21	11.12.2019	3:00:13-3:59:13	52.11	A	Night	
22	11.12.2019	4:00:13-4:59:13	56.03	A	Night	
23	11.12.2019	5:00:13-5:59:13	55.78	A	Night	
24	11.12.2019	6:00:13-6:59:13	55.78	A	Night	
Average			**55.40**			

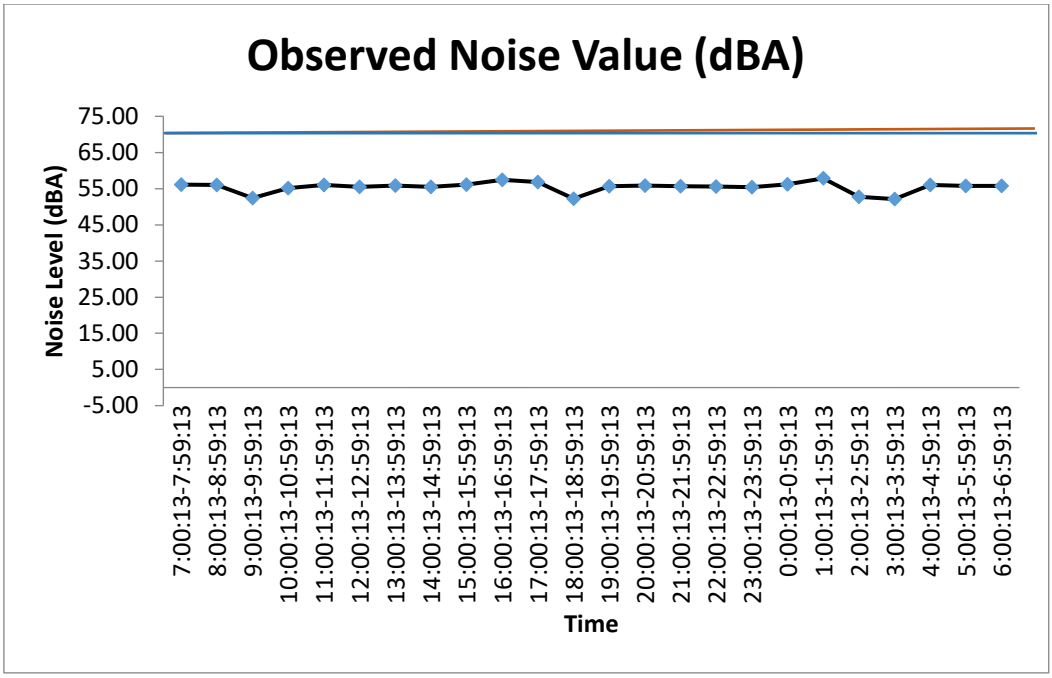

Figure 4. 17 Noise Level at near Sembcorp Myingyan Power Plant

Table 4. 7 Observed Values of Noise Level Measurement at Sa Ka Village

No.	Date	Time	Observed Mean Value (Source)	Weight	Day/Night	Average
1	10.12.2019	7:00:13-7:59:13	49.78	A	Day	50.88
2	10.12.2019	8:00:13-8:59:13	50.41	A	Day	
3	10.12.2019	9:00:13-9:59:13	49.68	A	Day	
4	9.12.2019	10:00:13-10:59:13	53.68	A	Day	
5	9.12.2019	11:00:13-11:59:13	51.38	A	Day	
6	9.12.2019	12:00:13-12:59:13	49.35	A	Day	
7	9.12.2019	13:00:13-13:59:13	49.40	A	Day	
8	9.12.2019	14:00:13-14:59:13	50.54	A	Day	
9	9.12.2019	15:00:13-15:59:13	55.17	A	Day	
10	9.12.2019	16:00:13-16:59:13	52.32	A	Day	
11	9.12.2019	17:00:13-17:59:13	52.03	A	Day	
12	9.12.2019	18:00:13-18:59:13	53.77	A	Day	
13	9.12.2019	19:00:13-19:59:13	48.78	A	Day	
14	9.12.2019	20:00:13-20:59:13	47.98	A	Day	
15	9.12.2019	21:00:13-21:59:13	48.87	A	Day	
16	9.12.2019	22:00:13-22:59:13	50.03	A	Night	51.18
17	9.12.2019	23:00:13-23:59:13	49.29	A	Night	
18	10.12.2019	0:00:13-0:59:13	51.99	A	Night	
19	10.12.2019	1:00:13-1:59:13	50.13	A	Night	
20	10.12.2019	2:00:13-2:59:13	49.57	A	Night	

21	10.12.2019	3:00:13-3:59:13	52.23	A	Night	
22	10.12.2019	4:00:13-4:59:13	53.50	A	Night	
23	10.12.2019	5:00:13-5:59:13	51.13	A	Night	
24	10.12.2019	6:00:13-6:59:13	52.74	A	Night	
Average			**50.99**			

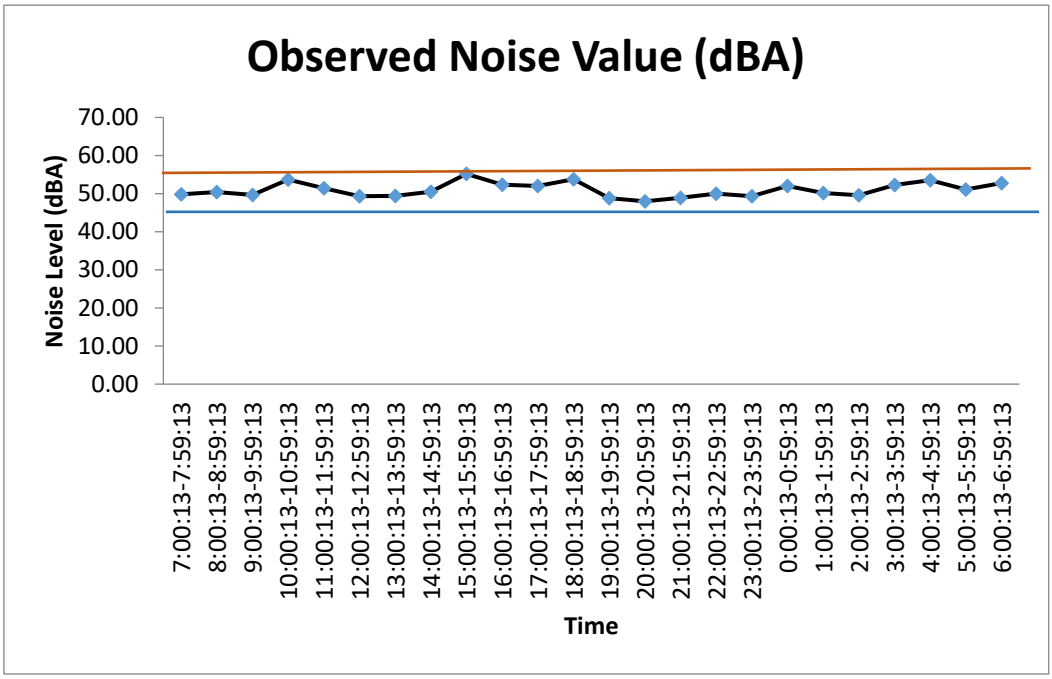

Figure 4. 18 Noise Level at Sa Ka Village

Table 4. 8 Observed Ambient Noise level Results from Myingyan Power Plant

Point	**Sembcorp Myingyan Power Plant**	
	Day Time	Night Time
Sembcorp Myingyan Power Plant	55.48	55.28
Guideline Values	70	70

Table 4. 9 Observed Ambient Noise level Results from Sa Ka Village

Point	**Sembcorp Myingyan Power Plant**	
	Day Time	Night Time
Sa Ka Village	50.88	51.18
Guideline Values	55	45

The observed values of sembcorp myingyan power plant are lower than the guidelines. So, Sembcorp myingyan power plant is acceptable for environmental. The observed values are compared with the

National Environmental Quality (Emission) Guidelines as shown in **Table 4. 10** which indicates the separate level for residential and industrial points.

Table 4. 10 National Environmental Quality (Emission) Guidelines Values for Noise Level

Receptor	One Hour LAeq (dBA)	
	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

The observed values of the proposed project for daytime at sembcorp myingyan power plant and Sa Ka village are 55.48 dB (A) and 50.88 dB (A). The observed values of the proposed project for night time at sembcorp myingyan power plant and Sa Ka village are 55.28 dB (A) and 51.18 dB (A). The proposed project is located adjacent to the residential and commercial area. So, the observed values of daytime and nighttime at sembcorp myingyan power plant are under the National Environmental Quality (Emission) Guidelines. The observed values of daytime at Sa Ka Village is under the National Environmental Quality (Emission) Guidelines The observed values of nighttime at Sa Ka village is upper the National Environmental Quality (Emission) Guidelines because this monitoring location is Sa Ka North Monastery. This monastery have near road. This monastery have devotional of Buddha at Nighttime. So, the observed values of nighttime at Sa Ka village is upper the National Environmental Quality (Emission) Guidelines. But, Sa Ka village is acceptable Applicable Operational Noise Criteria of 54 dB (A) from ESIA Report.

APPENDIX A

Description of Haz-scanner (EPAS)

Publication 1601 Rev 1406

HAZ-SCANNER EPAS

Wireless Environmental Perimeter Air Station

HAZ-SCANNER EPAS shown with optional solar panels

Performance Profile

The HAZ-SCANNER EPAS is optimized for ambient air applications; custom calibration for specific ranges or applications is available upon request.

Display	LCD real time
Operation	4-key splash-proof membrane switch
Power	12-V Absorption Glass Mat (AGM) rechargable battery, 100-240 V AC, or optional solar panel
Display Measurements	Max, Min, TWA, STEL
Recording Time	1 sec to 21 weeks
Sampling Rate	1 sec, 1 min, 10 min, 1 hr, adjustable
Data Storage	450,560 data points
Sampling Pump	1.0 to 3.0 L/min
Digital Output	RS-232 (PC), RS-422 (Mac)
Software	PC or Mac
Dimensions (weather-proof case)	6 x 14 x 10 in (15.2 x 35.6 x 25.4 cm)
Weight	12 lbs (5.4 kg)
Operating Temperature	23 to 122 F (-5 to 50 C)
Storage Temperature	-40 to 140 F (-40 to 60 C)
Humidity	95% non-condensing (use inlet heater)
Wireless Radio Modem	900 MHz (U.S.), 868 MHz (Euro) up to 5 miles - line of sight (optional)
Auxiliary Analog Input	0 to 2.5 VDC (1 channel for alternative meter)

Configure an EPAS for Up to 14 Simultaneous Measurements

The standard HAZ-SCANNER EPAS includes the monitor (calibrated for ambient air applications) with sensors/meters for PM10 or TSP, VOCs, temperature, humidity, and wind speed/direction in a NEMA 4 enclosure, acid gas scrubber, internal battery, universal 110-240 V AC battery charger, software, cables, and CD with instructions.

Configure the monitor with additional sensors/meters — up to 4 optional interchangable sensors with upgradable software and/or up to 4 EPAS-specific meters (listed below). **See page 3 for specifications.** ***Specify sensors and meters when ordering.***

- PM1.0, 2.5, or 4.0
- Ammonia (EC)
- Carbon Dioxide (NDIR)
- Carbon Monoxide (EC)
- Chlorine (EC)
- Ethylene Oxide (EL)
- Hydrocarbon (methane-specific, EC)
- Hydrocarbons (EC)
- Hydrogen Chloride (EL)
- Hydrogen Cyanide (EC)
- Hydrogen Sulfide (EC)
- Nitric Oxide (EC)
- Nitrogen Dioxide
- Oxygen
- Ozone
- Phosphine (EL)
- Sulfur Dioxide
- Rain
- Solar Radiance
- Sound and Noise
- Atomic Radiation
- ELF Radiation
- Barometric Pressure
- Dew Point Temperature
- Wet Bulb Temperature

Contact SKC to build an EPAS with available sensors/meters/calibration for your application!

SKC Inc. 724-941-9701 SKC West 714-992-2780 SKC Gulf Coast 281-859-8050 SKC South 434-852-7149
www.skcinc.com

HAZ-SCANNER EPAS

Wireless Environmental Perimeter Air Station

HAZ-SCANNER EPAS Sensor/Meter Specifications

Parameter	Sensor*	Measurement/ Concentration Range	Accuracy	Minimum Resolution	Display Resolution	Additional Information
Particulates	90° infrared light scattering	0 to 5000 µg/m³	Greater of < ± 10% of reading or 0.2% full scale	10 µg/m³	1 µg/m³	Measures particle sizes 10 µm or TSP (standard) or 1, 2.5, or 4 µm (optional) in the 0.1 to 100 µm size range
VOCs	PID (10.6 eV)	0 to 50,000 ppb (0 to 50 ppm)	Greater of < ± 10% of reading or 2% full scale	5 ppb	1 ppb	Minimum detection level is 0.01 ppm. Standard sensor
Toxic Gas: NH_3 - Ammonia	Gas-sensing semiconductor (GSS) technology	0 to 100 ppm	Greater of < ± 10% of reading or 2% full scale	< 0.2 ppm	0.1 ppm	Optional sensor
Toxic Gas: CO_2 - Carbon Dioxide	NDIR	0 to 5000 ppm	Greater of < ± 10% of reading or 2% full scale	50 ppm	1 ppm	Optional sensor
Toxic Gas: CO - Carbon Monoxide	Electrochemical	0 to 10,000 ppb (0 to 10 ppm)	Greater of < ± 10% of reading or 2% full scale	20 ppb	1 ppb	Optional sensor
Toxic Gas: Cl_2 - Chlorine	Electrochemical	0 to 100 ppm	Greater of < ± 10% of reading or 2% full scale	< 0.2 ppm	0.1 ppm	Optional sensor
Toxic Gas: (C_2H_4O) - Ethylene Oxide	Electrochemical	0 to 1500 ppm	Greater of < ± 10% of reading or 2% full scale	8 ppm	1 ppm	Optional sensor
Toxic Gas: Hydrocarbon, CH_4 - Methane-specific	NDIR	0 to 1% Vol., 0 to 10,000 ppm, 0 to 20% LEL	Greater of < ± 10% of reading or 2% full scale	± 50 ppm or 0.1% LEL	50 ppm/ 0.1% LEL	Optional sensor
Toxic Gas: (Non-methane) Hydrocarbons (HC)	NDIR	Calibrated for 0 to 20% LEL of selected gas	Greater of < ± 10% of reading or 2% full scale	± 50 ppm/ 0.1% LEL	50 ppm/ 0.1% LEL	Optional sensor - specify gas type when ordering: ethane, propane, butane, hexane, ethanol, ethylene, or ethylene oxide
Toxic Gas: HCl - Hydrogen Chloride	Electrochemical	0 to 100 ppm	Greater of < ± 10% of reading or 2% full scale	< 0.2 ppm	0.1 ppm	Optional sensor
Toxic Gas: HCN - Hydrogen Cyanide	Electrochemical	0 to 100 ppm	Greater of < ± 10% of reading or 2% full scale	< 0.2 ppm	0.1 ppm	Optional sensor
Toxic Gas: H_2S - Hydrogen Sulfide	Electrochemical	0 to 25 ppm	Greater of < ± 10% of reading or 2% full scale	< 0.15 ppm	0.1 ppm	Optional sensor
Toxic Gas: NO - Nitric Oxide	Electrochemical	0 to 100 ppm	Greater of < ± 10% of reading or 2% full scale	< 0.2 ppm	0.1 ppm	Optional sensor
Toxic Gas: NO_2 - Nitrogen Dioxide	Electrochemical	0 to 5000 ppb (0 to 5 ppm)	Greater of < ± 10% of reading or 2% full scale	5 ppb	1 ppb	Optional sensor
Toxic Gas: O_2 - Oxygen	Electrochemical	0 to 30% Vol.	Greater of < ± 10% of reading or 2% full scale	0.6%	0.1%	Optional sensor
Toxic Gas: O_3 - Ozone	Gas-sensing semiconductor (GSS) technology	0 to 150 ppb (0 to 0.15 ppm), 0 to 500 ppb (0 to 0.5 ppm)	Greater of < ± 10% of reading or 2% full scale	1 ppb	1 ppb	Optional sensor
Toxic Gas: PH_3 - Phosphine	Electrochemical	0 to 100 ppm	Greater of < ± 10% of reading or 2% full scale	< 0.2 ppm	0.1 ppm	Optional sensor
Toxic Gas: SO_2 - Sulfur Dioxide	Electrochemical	0 to 5000 ppb (0 to 5 ppm) for ambient applications	Greater of < ± 10% of reading or 2% full scale	5 ppb	1 ppb	Optional sensor

* Not approved for intrinsically safe applications; do not use in explosive gas environments.

Specifications continued on next page

SKC Inc. 724-941-9701 SKC West 714-992-2780 SKC Gulf Coast 281-859-8050 SKC South 434-852-7149
www.skcinc.com

HAZ-SCANNER EPAS Sensor/Meter Specifications *(con't)*

Parameter	Sensor*	Measurement/ Concentration Range	Accuracy	Minimum Resolution	Display Resolution	Additional Information
Rain Fall/ Precipitation	Rain gauge (heated, tipping bucket)	0 to 5 inches daily	± 1% at 2 in/hr	0.01 in	0.01 in/tip	Optional meter
Temperature	NTC thermister	-4 to 140 F (-20 to 60 C)	Greater of ± 3% degree F or C of reading	1 degree F or C	1 degree F or C	Standard sensor
Relative Humidity (RH)	Thin-film capacitive	0 to 100% RH	± 2% RH	1% RH	1% RH	Standard sensor
Solar Radiance Intensity	Photodiode	1110 watts/ square meter (W/m²)	± 5% of full scale (reference Eppley PSP at 1000 W/m²)	1 W/m²	1 W/m²	Optional meter
Sound and Noise	Type 2 SLM	30 to 130 decibels (dB)	± 1.5 dB	0.1 dB	1 dB	Optional meter
Atomic Radiation	Geiger counter	1 to 19,999 counts per minute (cpm) or 0.001 to 100 milliRad/hr	± 10% Typical, ± 15% Max.	1 cpm or .001 mR/hr	1 cpm or .001 mR/hr	Optional meter
ELF Radiation	Sensor with single-axis probe	1 to 200 gauss (G)	± 10% or 5% FS	1 G	1 G	Optional meter
Wind Speed/ Direction	3-cut anemometer/ continuous rotation potentiometric wind direction vane	0 to 125 mph/ 5 to 355°	± 1 mph or ± 3%/± 3°	1 mph/1°	1 mph/1°	Standard sensor
Barometric Pressure	Piezo resistive	28.25 to 30.75 in Hg	± 0.09 in Hg	0.01 in Hg	0.01 in Hg	Optional sensor
Dew Point Temperature	Software calculation from RH and temperature	8.2 to 122 F (-16 to 50 C)	± 3 F	1 F	1 F	Optional meter - software calculated
Wet Bulb Temperature	Capsulated thermistor with wick	8.2 to 122 F (-16 to 50 C)	± 3 F	1 F	1 F	Optional meter - one meter

* Not approved for intrinsically safe applications; do not use in explosive gas environments.

Calibration Certificate for Haz-scanner

NANOVA CO., LTD.
Medical Scientific Industrial

Calibration Certificate

Customer	Eguard
System Model	EPAS
System Serial	915081
Calibration Date	2018 April 21

Sensor	Low	Actual	High	Actual
CO	0 ppm	0 ppm	10 ppm	8.2 ppm
CO2	0 ppm	0 ppm	300 ppm	250 ppm
SO2	0 ppm	0 ppm	2 ppm	1.5 ppm
NO2	0 ppm	0 ppm	3 ppm	2.1 ppm
PMA	0 ug/m3	0 ug/m3	23400 ug/m3	21100 ug/m3
PMB	0 ug/m3	0 ug/m3	21000 ug/m3	19100 ug/m3

Temperature **22 deg C**
Relative Humidity **32%**

Note
 # Perform by EDC technican's instruction.
 # This instrument is manufactured by Environmenatl Device Corporation (USA).

Environmental
Devices Corporation

Perform by

Nanda Maung	Technical Service Engineer	Nanova Co;ltd

Yangon Ofice
22A , Shan Yeik Thar Street , Sanchaung Township.
01-2304901 , 01-2304902
Help Line - 09977477774

APPENDIX B

Field Photos

Air Monitoring Point at Sa Ka Village (ASR4) Lat- 21°23’48.460”, Long- 95°23’2.530” 9.12.2019 to 10.12.2019	
Air Monitoring Point at Hnan Ywa Village (ASR3) Lat- 21°22’18.130”, Long- 95°23’17.110” 10.12.2019 to 11.12.2019	

Air Monitoring Point at Gyoke Pin Village (ASR5) Lat- 21°24’21.128”, Long- 95°21’07.386” 11.12.2019 to 12.12.2019	
Air Monitoring Point at Nyaung Kan Village (ASR14) Lat- 21°21’58.181”, Long- 95°20’51.453” 12.12.2019 to 13.12.2019	

Sembcorp Myingyan Power Co., Ltd.

Environmental Monitoring Report

(Air Quality Monitoring)

Prepared by

Ref: 16.03.2020 to 20.03.2020 (Air Quality Report)

5 April 2020

E Guard Environmental Services

Table of Contents

List of Figures

List of Tables

1. INTRODUCTION

This report is environmental monitoring (only air and noise quality monitoring) for Sembcorp Myingyan Power Plant which is located beside of Myingyan – Nyaung-Oo Road, near the Sa Ka village in Mandalay Region.

2. METHODOLOGY

Baseline environmental parameters and sampling locations were defined according to the objectives for environmental monitoring purposes. Locations for sampling and analysis of ambient air quality of the project site were identified by Sembcorp Myingyan Power Co,ltd.

2.1 Ambient Air Quality

The emissions of dust particles and gases were measured for 24hrs continuously at the selected sites by using the Environmental Perimeter Air Station (EPAS), and EPAS provides direct readings in real time with data-logging capabilities. The monitoring results were compared with National Environmental Quality (Emission) Guideline (NEQG), World Health Organization (WHO) and American Conference of Governmental Industrial Hygienists (ACGIH) guidelines.

Table 2. 1 Ambient Air Quality Parameters

Ambient Air Quality (4 locations)	
Gas Emission	CO, CO_2, SO_2, NO_2
Dust Emission	PM_{10}, $PM_{2.5}$

Table 2. 2 Air Quality Guideline Values

Parameters	Guidelines Value	Unit	Organization	Averaging Period
PM_{10}	50	$\mu g/m^3$	NEQ	24hrs
$PM_{2.5}$	25	$\mu g/m^3$	NEQ	24hrs
CO	9	ppm	NAAQS	8hrs
CO_2	5000	ppm	ACGIH	8hrs
SO_2	20	$\mu g/m^3$	NEQ	24hrs
NO_2	200	$\mu g/m^3$	NEQ	24hrs

Source: Myanmar National Environmental Quality (Emission) Guidelines, December 2015 & Air quality guidelines global update. 2005. World Health Organization.

2.2 Ambient Noise

Noise level LAeq (dBA) will be measured at the selected locations that can reflect the exposure of the nearest local community and sensitive locations. Duration and frequency were measured for 24hrs continuously at the selected site using the Noise Meter.

The monitoring procedures, data analysis and interpretation were carried out in accordance with the instrument's manufacture and National Environmental Quality (Emission) Guidelines, World Health Organization (WHO) and International Finance Corporation (IFC guidelines in order to be in line with Environmental Conservation Department, Ministry of Natural Resources and Environment Conservation (MONREC). "National Environmental Quality

(Emission) Guidelines" for Myanmar was also presented the value of noise level as LAeq (dBA).

Table 2. 3 Noise level monitoring

Noise monitoring (2 locations)	
Noise Emission	LAeq (dBA) (1hrs, 24 hrs.)

Equipment used to measure ambient air and noise measurement are shown below (**Table 2. 4**).

Table 2. 4 Equipment used to measure ambient air and noise measurement

Davis Vantage Pro2 Wireless Weather Station Provides detailed current weather conditions and expanded forecasts - all at a glance! The Vantage Pro2 uses a frequency-hopping spread spectrum radio from 902 MHz to 928 MHz to transmit and receive data up to 1,000' (300m) line of sight. In addition, the weather station features a bubble level, improved anemometer base, redesigned wind cups, and factory-calibrated wind direction. The integrated sensor suite combines temperature and humidity sensors, rain collector with an aluminum-plated tipping bucket, and anemometer into one package for easy setup. Measure inside and outside temperature and humidity, heat index, barometric pressure, dew point, rainfall, wind direction and speed, and wind chill.	
Haz-Scanner EPAS PM_{10}, PM $_{2.5}$, NO_2, SO_2, CO, CO_2, Temperature, and Relative Humidity	
Digital Sound Level Meter Noise and Vibration	

3. MONITORING LOCATIONS

Locations of sampling sites were identified by Sembcorp Myingyan Power Co,ltd. Air quality was monitored at the four selected locations that are Sa Ka Village (ASR4), Hnan Ywa Village (ASR3), Gyoke Pin Village (ASR 5) and Nyaung Kan Village (ASR 14).

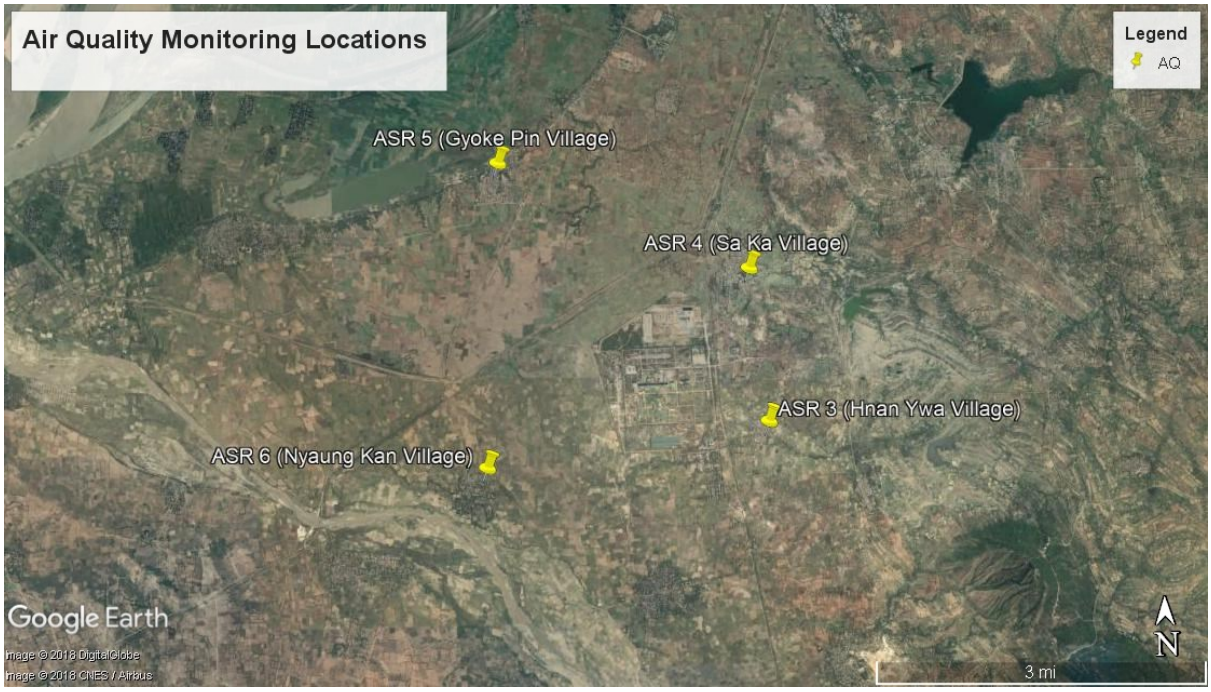

Figure 3. 1 Location of Monitoring Points

Table 3. 1 Location of Monitoring Points

Locations No.	Points	Coordinate	Locations
Ambient Air Quality and Noise Monitoring Locations			
1	ASR4	Lat- 21°23’48.591”, Long- 95°23’0.849”	Sa Ka Village
2	ASR3	Lat- 21°22’17.565”, Long- 95°23’18.116”	Hnan Ywa Village
3	ASR5	Lat- 21°24’21.888”, Long- 95°21’7.381”	Gyoke Pin Village
4	ASR14	Lat- 21°21’58.048”, Long- 95°20’51.346”	Nyaung Kan Village

4. ENVIRONMENTAL QUALITY MONITORING RESULTS

4.1 Ambient Air Quality Monitoring Results

24 hours air quality monitoring were done at each selected location from 16 March 2020 to 20 March 2020. The measured results are compared with national emission guidelines. Based on the results of air quality monitoring, most of the parameters are within the guidelines.

Table 4. 1 Observed Ambient Air Quality Results from Selected Points

Parameters	Observed Value				Guidelines Value	Unit	Averaging Period
	ASR4	ASR3	ASR5	ASR14			
PM_{10}	22.66	23.61	19.66	28.43	50	$\mu g/m^3$	24hrs
$PM_{2.5}$	13.74	14.18	11.04	17.45	25	$\mu g/m^3$	24hrs
CO	0.00	0.00	0.01	0.00	9	ppm	8hrs
CO_2	442.24	445.29	501.07	500.75	5000	ppm	8hrs
SO_2	0.00	0.00	0.00	0.00	20	$\mu g/m^3$	24hrs
NO_2	3.79	3.76	30.52	28.70	200	$\mu g/m^3$	1hrs

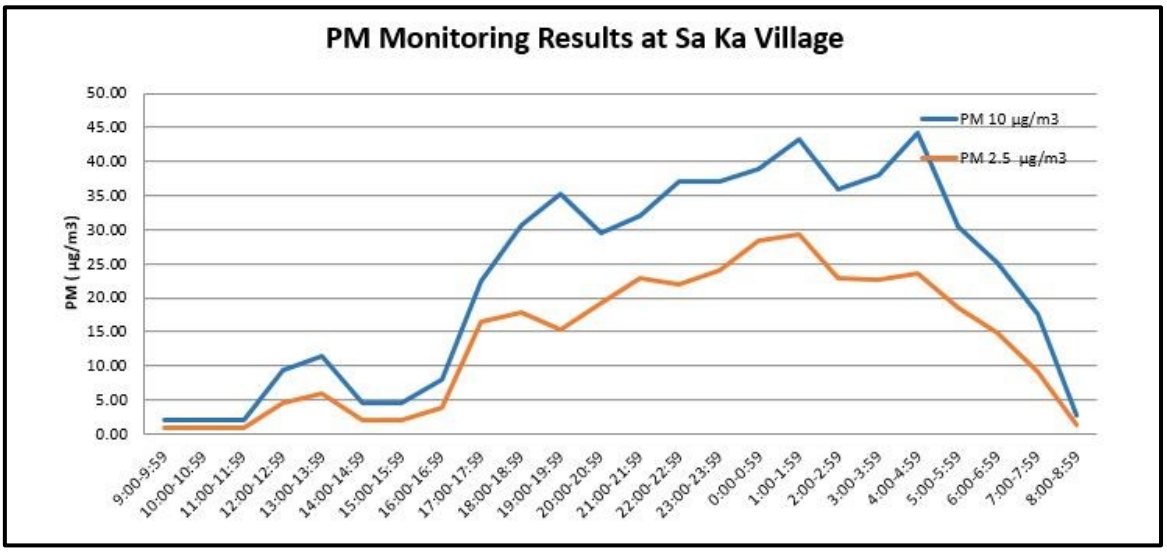

Figure 4. 1 PM Monitoring Results at Sa Ka Village

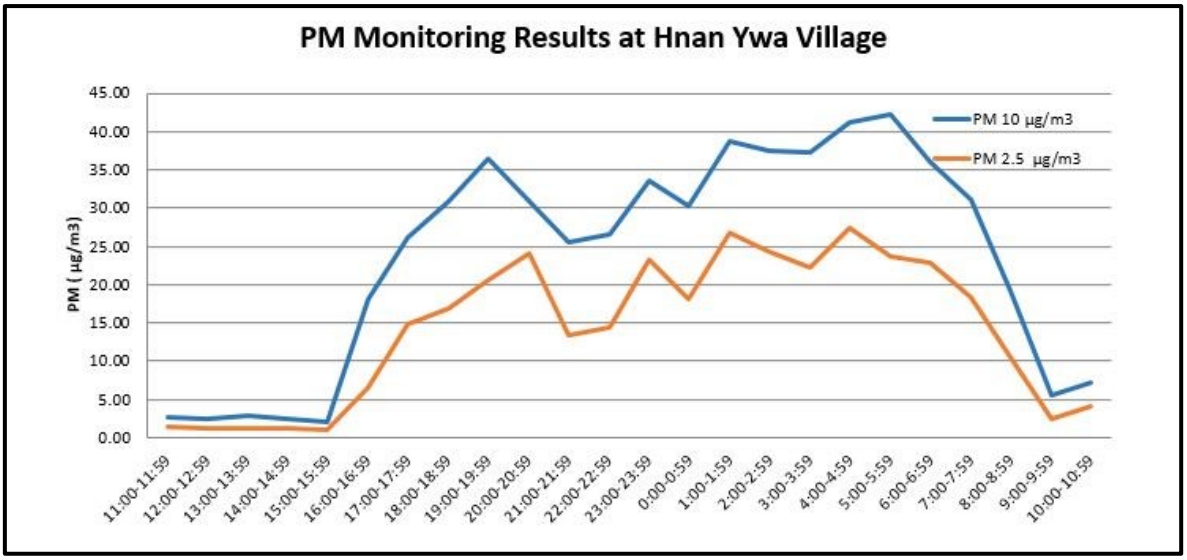

Figure 4. 2 PM Monitoring Results at Hnan Ywa Village

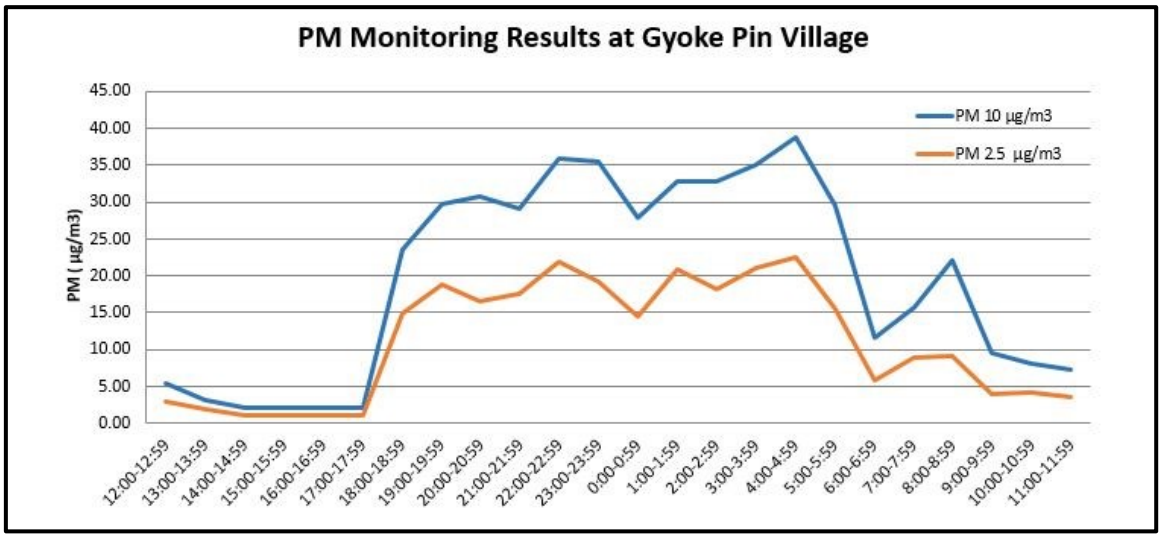

Figure 4. 3 PM Monitoring Results at Gyoke Pin Village

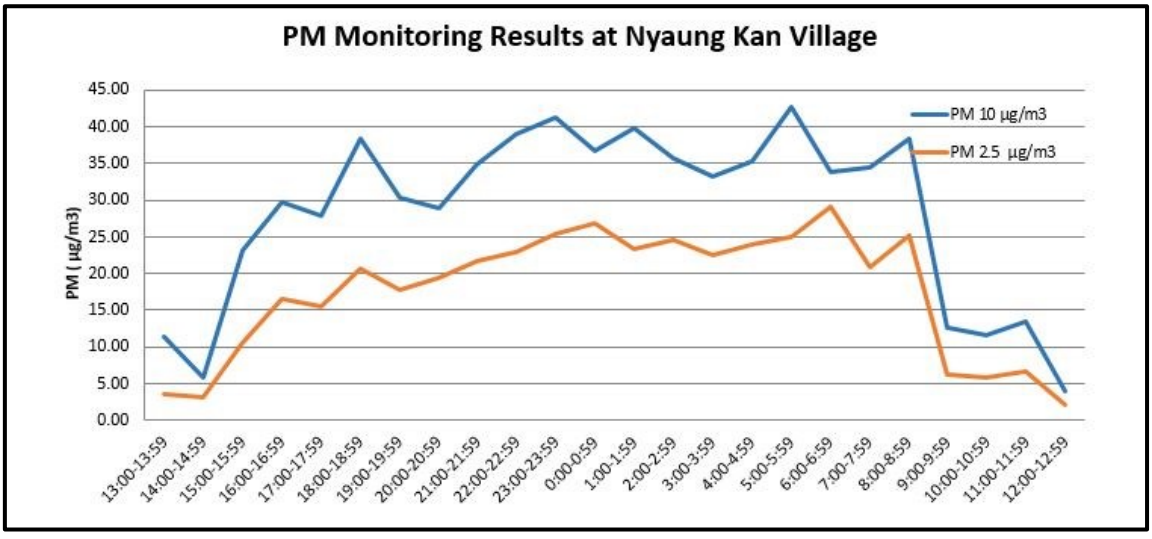

Figure 4. 4 PM Monitoring Results at Nyaung Kan Village

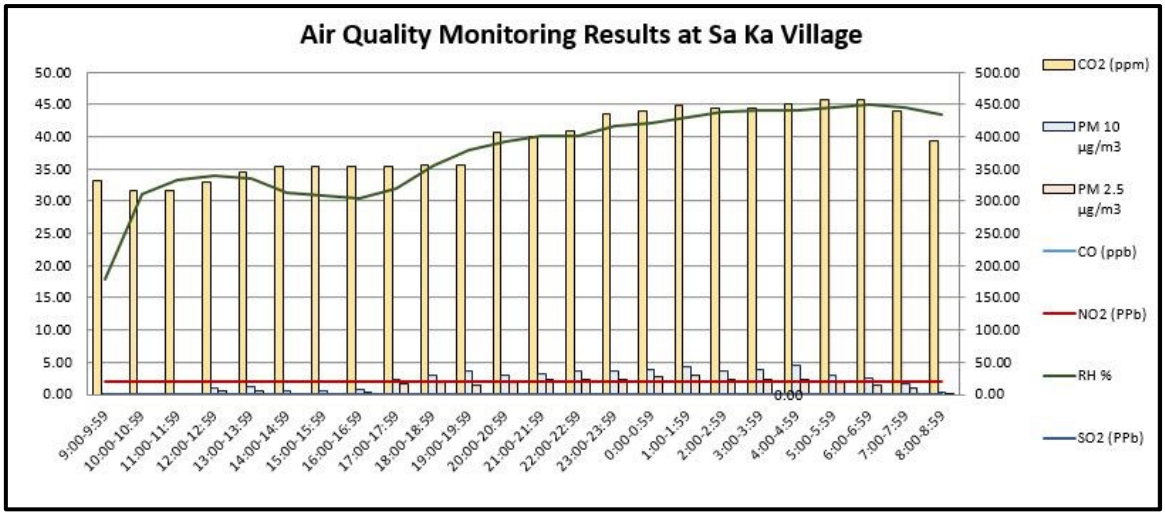

Figure 4. 5 Fluctuation of Air Pollutants during dial cycle (Sa Ka Village)

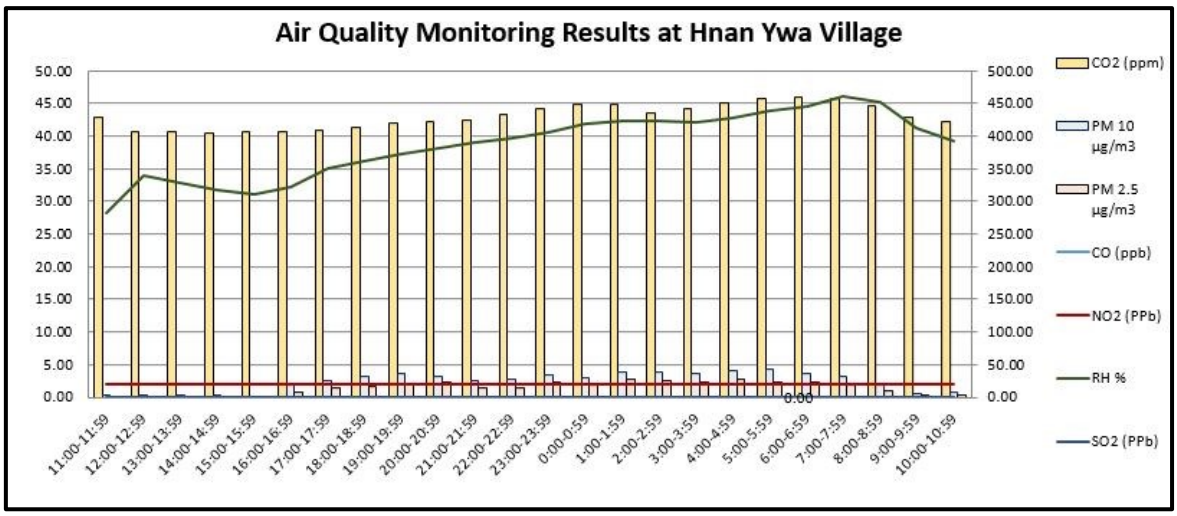

Figure 4. 6 Fluctuation of Air Pollutants during dial cycle (Hnan Ywa Village)

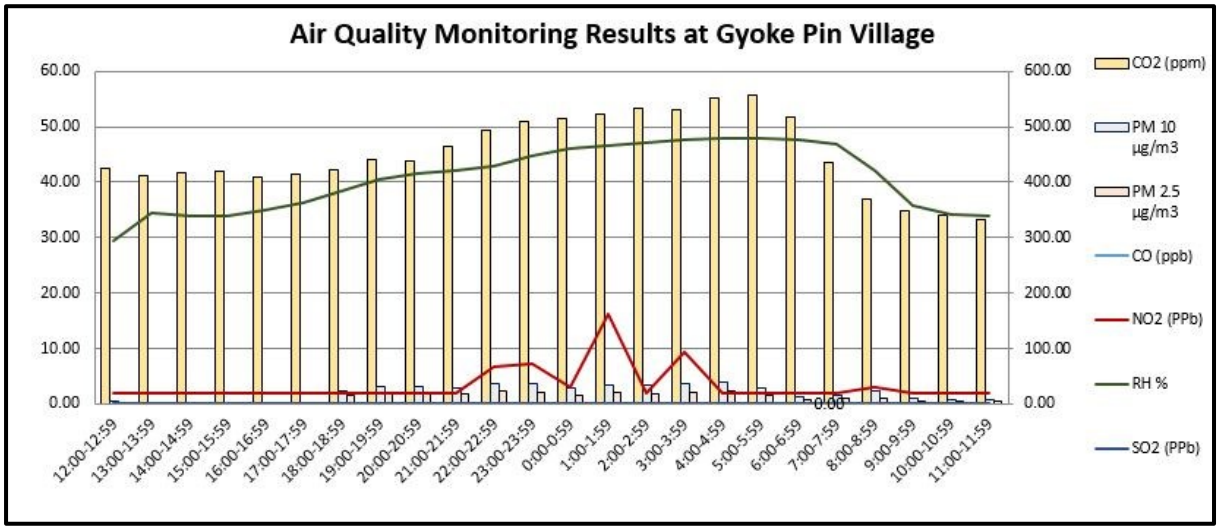

Figure 4. 7 Fluctuation of Air Pollutants during dial cycle (Gyoke Pin Village)

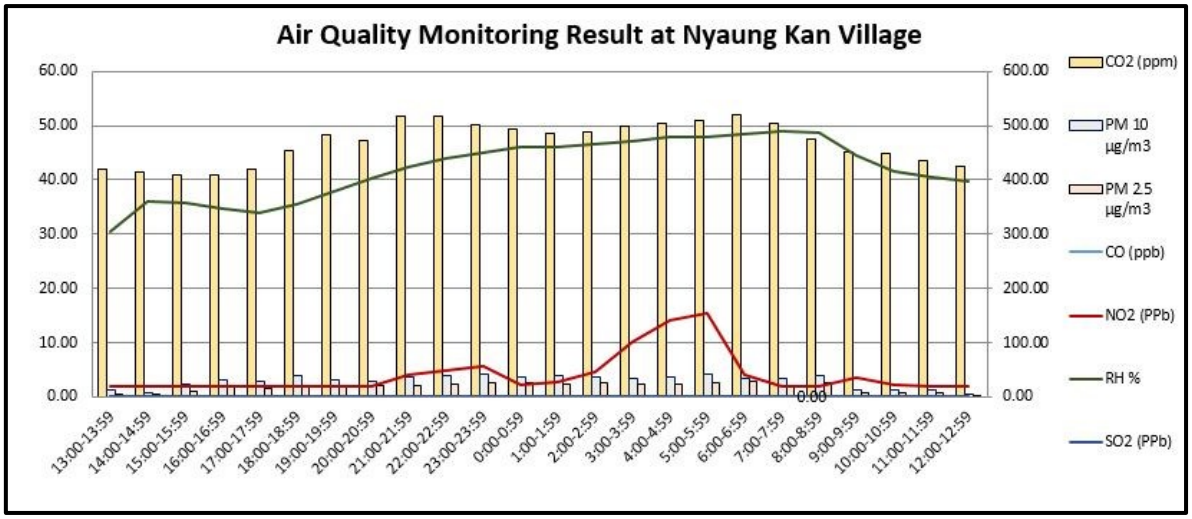

Figure 4. 8 Fluctuation of Air Pollutants during dial cycle (Nyaung Kan Village)

Detail results with one-hour interval of pollutants are shown in **Table 4. 2** to **Table 4. 5.** All results are under the Myanmar National Environmental Quality (emission) Guidelines. So, Sembcorp Myingyan Power Plant is acceptable for environment.

Table 4. 2 Air Monitoring Results (Sa Ka Village)

Date	Time		CO_2 (ppm)	CO (ppb)	NO_2 (ppb)	PM_{10} µg/m^3	$PM_{2.5}$ µg/m^3	RH %	SO_2 (ppb)
16.3.2020	9:00-9:59	Average	332.37	0.00	2.00	2.00	1.00	17.92	0.00
16.3.2020	10:00-10:59	Average	315.08	0.00	2.00	2.00	1.00	31.02	0.00
16.3.2020	11:00-11:59	Average	315.72	0.00	2.02	2.00	1.00	33.18	0.00
16.3.2020	12:00-12:59	Average	328.43	0.00	2.00	9.38	4.45	34.00	0.00
16.3.2020	13:00-13:59	Average	344.03	0.00	2.00	11.42	5.97	33.52	0.00
16.3.2020	14:00-14:59	Average	353.18	0.00	2.00	4.52	2.08	31.30	0.00
16.3.2020	15:00-15:59	Average	354.40	0.00	2.00	4.58	2.03	30.73	0.00
16.3.2020	16:00-16:59	Average	353.53	0.00	2.00	7.98	3.95	30.43	0.00
16.3.2020	17:00-17:59	Average	353.95	0.00	2.00	22.52	16.47	31.87	0.00
16.3.2020	18:00-18:59	Average	355.50	0.00	2.00	30.55	17.88	35.55	0.00
16.3.2020	19:00-19:59	Average	355.45	0.00	2.00	35.20	15.33	37.85	0.00
16.3.2020	20:00-20:59	Average	406.22	0.00	2.00	29.62	19.25	39.32	0.00
16.3.2020	21:00-21:59	Average	399.82	0.00	2.00	32.07	22.77	40.00	0.00
16.3.2020	22:00-22:59	Average	409.25	0.00	2.00	37.08	22.03	40.17	0.00
16.3.2020	23:00-23:59	Average	435.03	0.00	2.00	37.08	23.95	41.70	0.00
17.3.2020	0:00-0:59	Average	439.48	0.00	2.00	38.87	28.47	42.18	0.00
17.3.2020	1:00-1:59	Average	449.08	0.00	2.00	43.15	29.23	43.00	0.00
17.3.2020	2:00-2:59	Average	444.43	0.00	2.00	35.92	22.88	43.77	0.00
17.3.2020	3:00-3:59	Average	444.62	0.00	2.00	38.07	22.55	44.00	0.00
17.3.2020	4:00-4:59	Average	451.30	0.00	2.00	44.17	23.60	44.00	0.00
17.3.2020	5:00-5:59	Average	457.70	0.00	2.00	30.42	18.47	44.55	0.00
17.3.2020	6:00-6:59	Average	456.22	0.00	2.00	25.07	14.75	45.00	0.00
17.3.2020	7:00-7:59	Average	440.32	0.00	2.00	17.52	9.15	44.43	0.00
17.3.2020	8:00-8:59	Average	394.23	0.00	2.00	2.78	1.40	43.38	0.00
Average			391.22	0.00	2.00	22.66	13.74	37.62	0.00
1 hour Maximum			315.08	0.00	2.00	2.00	1.00	17.92	0.00
1 hour Minimum			457.70	0.00	2.02	44.17	29.23	45.00	0.00

Table 4. 3 Air Monitoring Results (Hnan Ywa Village)

Date	Time		CO_2 (ppm)	CO (ppb)	NO_2 (ppb)	PM_{10} µg/m^3	$PM_{2.5}$ µg/m^3	RH %	SO_2 (ppb)
17.3.2020	11:00-11:59	Average	429.42	0.00	2.00	2.72	1.35	28.32	0.00
17.3.2020	12:00-12:59	Average	406.62	0.00	2.00	2.48	1.15	34.00	0.00
17.3.2020	13:00-13:59	Average	405.53	0.00	2.00	2.93	1.12	32.85	0.00
17.3.2020	14:00-14:59	Average	405.18	0.00	2.00	2.35	1.17	31.67	0.00
17.3.2020	15:00-15:59	Average	406.60	0.00	2.00	2.00	1.00	31.00	0.00
17.3.2020	16:00-16:59	Average	406.42	0.00	2.00	18.08	6.62	32.17	0.00
17.3.2020	17:00-17:59	Average	407.65	0.00	2.00	26.18	14.80	34.98	0.00
17.3.2020	18:00-18:59	Average	412.78	0.00	2.00	30.98	16.80	36.07	0.00
17.3.2020	19:00-19:59	Average	418.82	0.00	2.00	36.38	20.57	37.33	0.00
17.3.2020	20:00-20:59	Average	421.27	0.00	2.00	30.87	24.13	38.05	0.00
17.3.2020	21:00-21:59	Average	423.92	0.00	2.00	25.60	13.38	39.00	0.00
17.3.2020	22:00-22:59	Average	433.17	0.00	2.00	26.50	14.50	39.62	0.00
17.3.2020	23:00-23:59	Average	441.80	0.00	2.00	33.53	23.27	40.43	0.00
18.3.2020	0:00-0:59	Average	448.53	0.00	2.00	30.27	18.08	41.77	0.00
18.3.2020	1:00-1:59	Average	449.22	0.00	2.00	38.63	26.70	42.35	0.00
18.3.2020	2:00-2:59	Average	436.08	0.00	2.00	37.38	24.20	42.30	0.00
18.3.2020	3:00-3:59	Average	441.60	0.00	2.00	37.18	22.30	42.12	0.00
18.3.2020	4:00-4:59	Average	450.10	0.00	2.00	41.23	27.50	42.85	0.00
18.3.2020	5:00-5:59	Average	456.10	0.00	2.00	42.33	23.58	43.95	0.00
18.3.2020	6:00-6:59	Average	460.30	0.00	2.00	35.95	22.78	44.57	0.00
18.3.2020	7:00-7:59	Average	458.17	0.00	2.00	31.13	18.28	45.97	0.00
18.3.2020	8:00-8:59	Average	445.60	0.00	2.00	19.15	10.52	45.12	0.00
18.3.2020	9:00-9:59	Average	428.08	0.00	2.00	5.55	2.38	41.28	0.00
18.3.2020	10:00-10:59	Average	422.40	0.00	2.00	7.17	4.13	39.20	0.00
Average			429.81	0.00	2.00	23.61	14.18	38.62	0.00
1 hour Maximum			405.18	0.00	2.00	2.00	1.00	28.32	0.00
1 hour Minimum			460.30	0.00	2.00	42.33	27.50	45.97	0.00

Table 4. 4 Air Monitoring Results (Gyoke Pin Village)

Date	Time		CO_2 (ppm)	CO (ppb)	NO_2 (ppb)	PM_{10} µg/m^3	$PM_{2.5}$ µg/m^3	RH %	SO_2 (ppb)
18.3.2020	12:00-12:59	Average	424.82	0.07	2.00	5.43	2.85	29.33	0.00
18.3.2020	13:00-13:59	Average	412.55	0.00	2.00	3.12	1.87	34.30	0.00
18.3.2020	14:00-14:59	Average	416.02	0.00	2.00	2.00	1.00	34.00	0.00
18.3.2020	15:00-15:59	Average	419.75	0.00	2.00	2.00	1.00	34.00	0.00
18.3.2020	16:00-16:59	Average	408.83	0.00	2.00	2.00	1.00	34.85	0.00
18.3.2020	17:00-17:59	Average	413.12	0.00	2.00	2.00	1.00	36.22	0.00
18.3.2020	18:00-18:59	Average	423.40	0.00	2.00	23.60	14.78	38.42	0.00
18.3.2020	19:00-19:59	Average	440.20	0.00	2.00	29.63	18.75	40.40	0.00
18.3.2020	20:00-20:59	Average	437.87	0.00	2.00	30.77	16.47	41.55	0.00
18.3.2020	21:00-21:59	Average	464.55	0.00	2.00	29.10	17.55	42.00	0.00
18.3.2020	22:00-22:59	Average	493.48	0.00	6.62	35.92	21.90	42.93	0.00
18.3.2020	23:00-23:59	Average	510.38	0.00	7.15	35.38	19.08	44.65	0.00
19.3.2020	0:00-0:59	Average	515.97	0.00	3.07	27.85	14.45	45.97	0.00
19.3.2020	1:00-1:59	Average	522.60	0.00	16.23	32.87	20.75	46.70	0.00
19.3.2020	2:00-2:59	Average	533.85	0.00	2.00	32.83	18.23	47.00	0.00
19.3.2020	3:00-3:59	Average	529.88	0.00	9.20	35.02	21.05	47.55	0.00
19.3.2020	4:00-4:59	Average	550.62	0.00	2.00	38.77	22.45	48.00	0.00
19.3.2020	5:00-5:59	Average	555.77	0.00	2.00	29.40	15.45	48.00	0.00
19.3.2020	6:00-6:59	Average	517.58	0.00	2.00	11.63	5.77	47.67	0.00
19.3.2020	7:00-7:59	Average	435.22	0.00	2.00	15.72	8.83	46.90	0.00
19.3.2020	8:00-8:59	Average	368.62	0.00	2.88	21.97	9.07	42.03	0.00
19.3.2020	9:00-9:59	Average	349.08	0.00	2.00	9.45	4.02	35.85	0.00
19.3.2020	10:00-10:59	Average	339.92	0.00	2.00	8.13	4.05	34.17	0.00
19.3.2020	11:00-11:59	Average	332.98	0.00	2.00	7.32	3.55	34.00	0.00
Average			450.71	0.00	3.38	19.66	11.04	40.69	0.00
1 hour Maximum			332.98	0.00	2.00	2.00	1.00	29.33	0.00
1 hour Minimum			555.77	0.07	16.23	38.77	22.45	48.00	0.00

Table 4. 5 Air Monitoring Results (Nyaung Kan Village)

Date	Time		CO_2 (ppm)	CO (ppb)	NO_2 (ppb)	PM_{10} µg/m3	$PM_{2.5}$ µg/m3	RH %	SO_2 (ppb)
19.3.2020	13:00-13:59	Average	419.65	0.00	2.00	11.27	3.58	30.48	0.00
19.3.2020	14:00-14:59	Average	414.63	0.00	2.00	5.77	3.18	36.08	0.00
19.3.2020	15:00-15:59	Average	410.00	0.00	2.00	23.10	10.43	35.65	0.00
19.3.2020	16:00-16:59	Average	407.95	0.00	2.00	29.67	16.43	34.62	0.00
19.3.2020	17:00-17:59	Average	418.70	0.00	2.00	27.83	15.57	34.00	0.00
19.3.2020	18:00-18:59	Average	454.50	0.00	2.00	38.30	20.55	35.58	0.00
19.3.2020	19:00-19:59	Average	483.13	0.00	2.00	30.35	17.80	37.93	0.00
19.3.2020	20:00-20:59	Average	472.38	0.00	2.00	28.80	19.42	40.20	0.00
19.3.2020	21:00-21:59	Average	518.17	0.00	4.05	34.93	21.57	42.27	0.00
19.3.2020	22:00-22:59	Average	516.33	0.00	4.85	39.05	22.82	43.95	0.00
19.3.2020	23:00-23:59	Average	501.12	0.00	5.52	41.23	25.42	45.02	0.00
20.3.2020	0:00-0:59	Average	492.75	0.00	2.08	36.78	26.80	45.98	0.00
20.3.2020	1:00-1:59	Average	486.52	0.00	2.70	39.77	23.22	46.00	0.00
20.3.2020	2:00-2:59	Average	488.05	0.00	4.42	35.75	24.47	46.52	0.00
20.3.2020	3:00-3:59	Average	498.97	0.00	9.98	33.28	22.52	47.00	0.00
20.3.2020	4:00-4:59	Average	504.07	0.00	13.93	35.27	23.95	47.85	0.00
20.3.2020	5:00-5:59	Average	509.10	0.00	15.27	42.75	25.05	48.00	0.00
20.3.2020	6:00-6:59	Average	520.27	0.00	4.03	33.90	29.15	48.47	0.00
20.3.2020	7:00-7:59	Average	503.98	0.00	2.00	34.52	20.87	49.00	0.00
20.3.2020	8:00-8:59	Average	475.00	0.00	2.00	38.40	25.23	48.72	0.00
20.3.2020	9:00-9:59	Average	450.77	0.00	3.43	12.53	6.28	44.42	0.00
20.3.2020	10:00-10:59	Average	449.37	0.00	2.25	11.60	5.80	41.67	0.00
20.3.2020	11:00-11:59	Average	436.02	0.00	2.00	13.45	6.53	40.53	0.00
20.3.2020	12:00-12:59	Average	424.65	0.00	2.00	4.00	2.17	39.78	0.00
Average			469.00	0.00	4.02	28.43	17.45	42.07	0.00
1 hour Minimum			407.95	0.00	2.00	4.00	2.17	30.48	0.00
1 hour Maximum			520.27	0.00	15.27	42.75	29.15	49.00	0.00

4.2 Wind Speed and Direction

The following figure describes the wind speed and wind direction of the proposed project site on, 16 to 20 March 2020 respectively. According to the data, the wind direction is following **Figure 4. 9 to Figure 4. 16.**

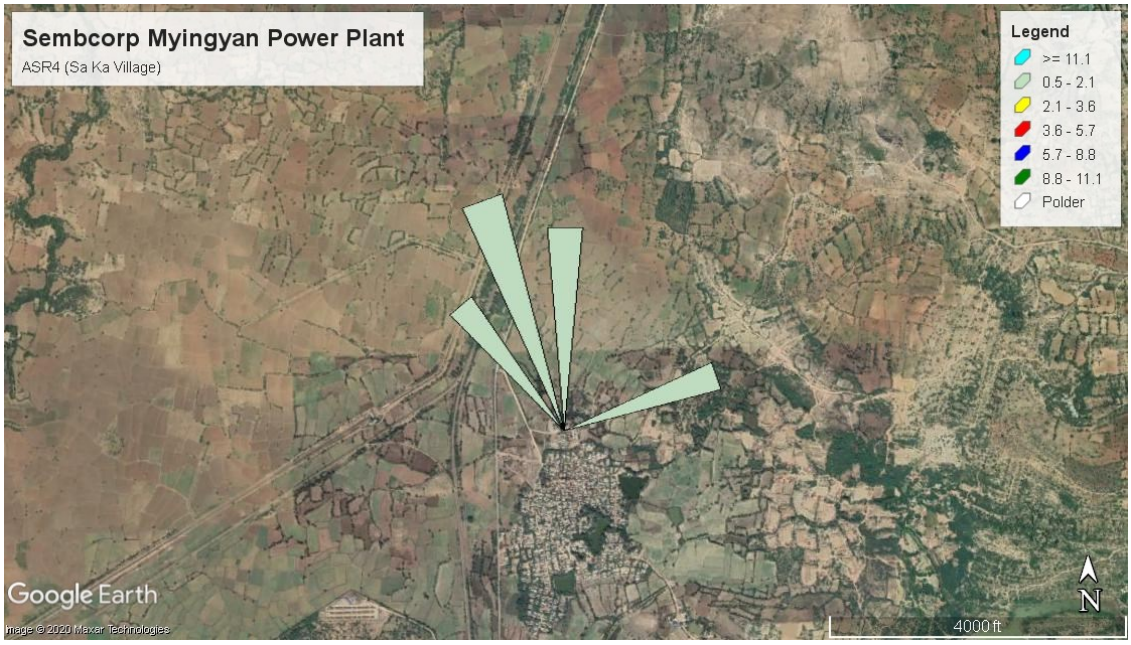

Figure 4. 9 Wind Speed and Wind Direction (Blowing From) at Sa Ka Village (ASR4)

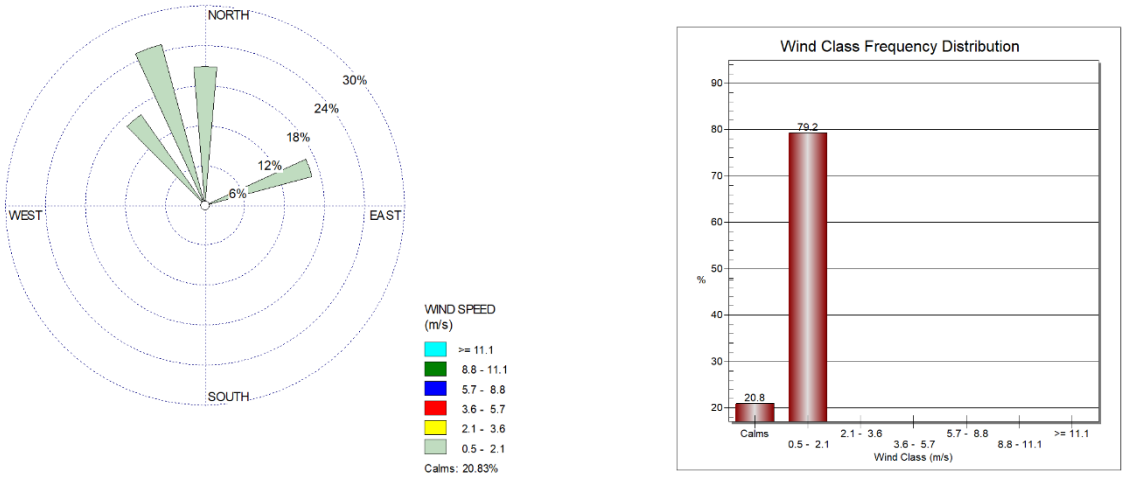

Figure 4. 10 Wind Class Frequency Distribution at Sa Ka Village (ASR4)

Figure 4. 11 Wind Speed and Wind Direction (Blowing From) at Hnan Ywa Village (ASR3)

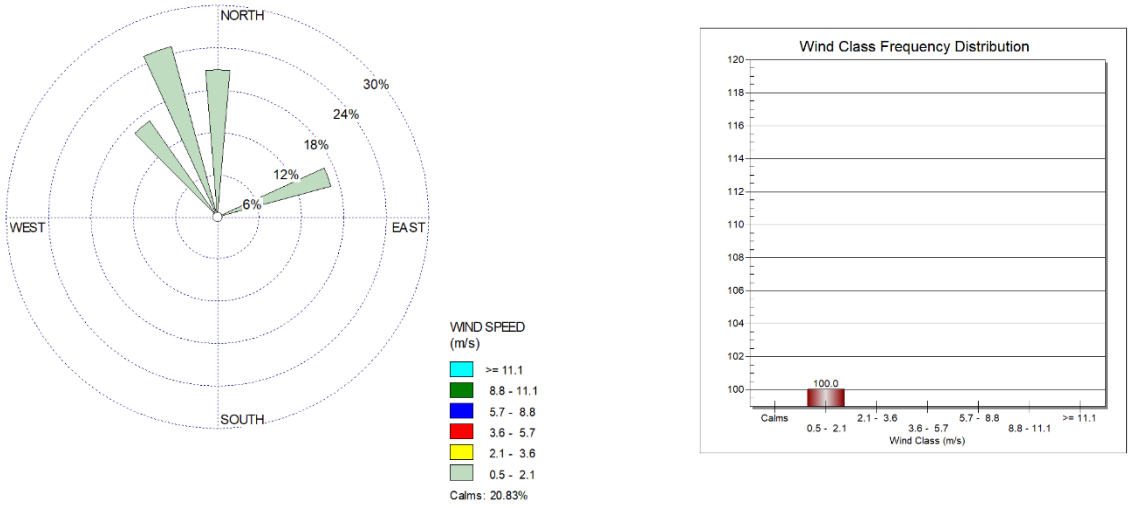

Figure 4. 12 Wind Class Frequency Distribution at Hnan Ywa Village (ASR3)

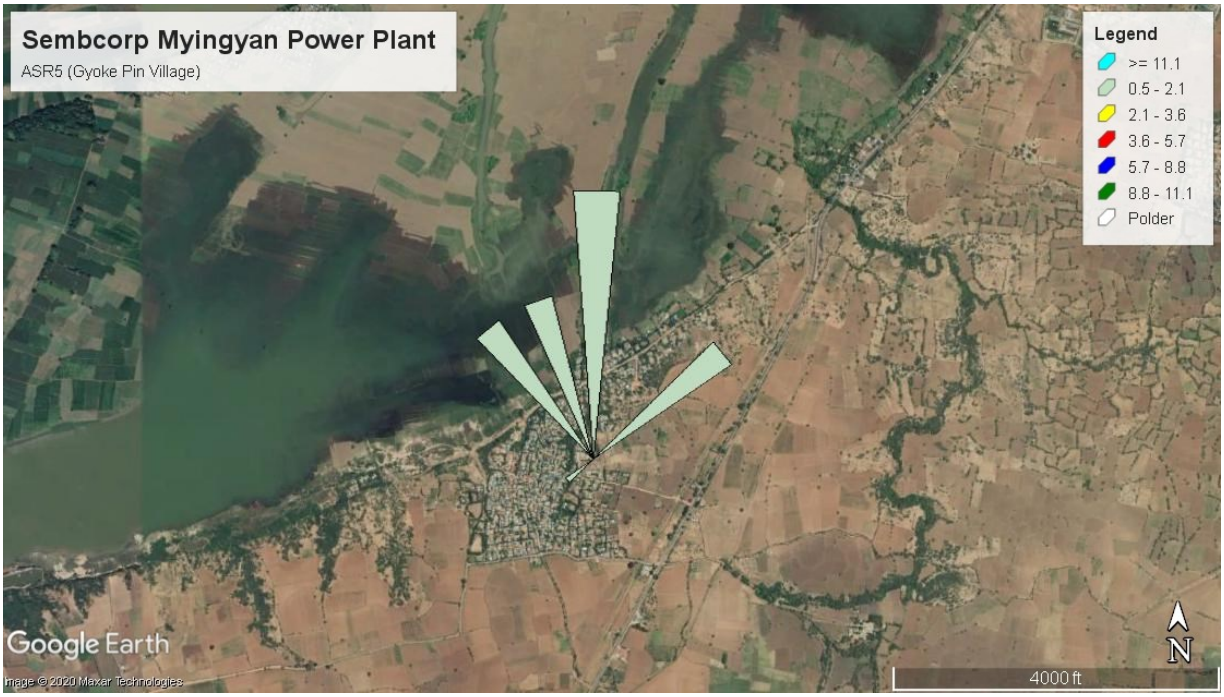

Figure 4. 13 Wind Speed and Wind Direction (Blowing From) at Gyoke Pin Village (ASR5)

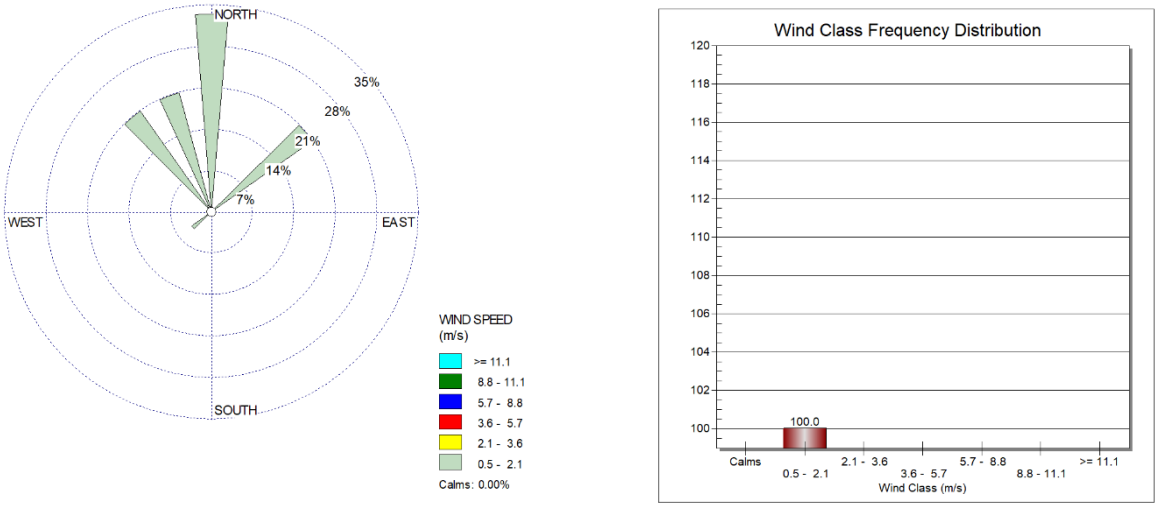

Figure 4. 14 Wind Class Frequency Distribution at Gyoke Pin Village (ASR5)

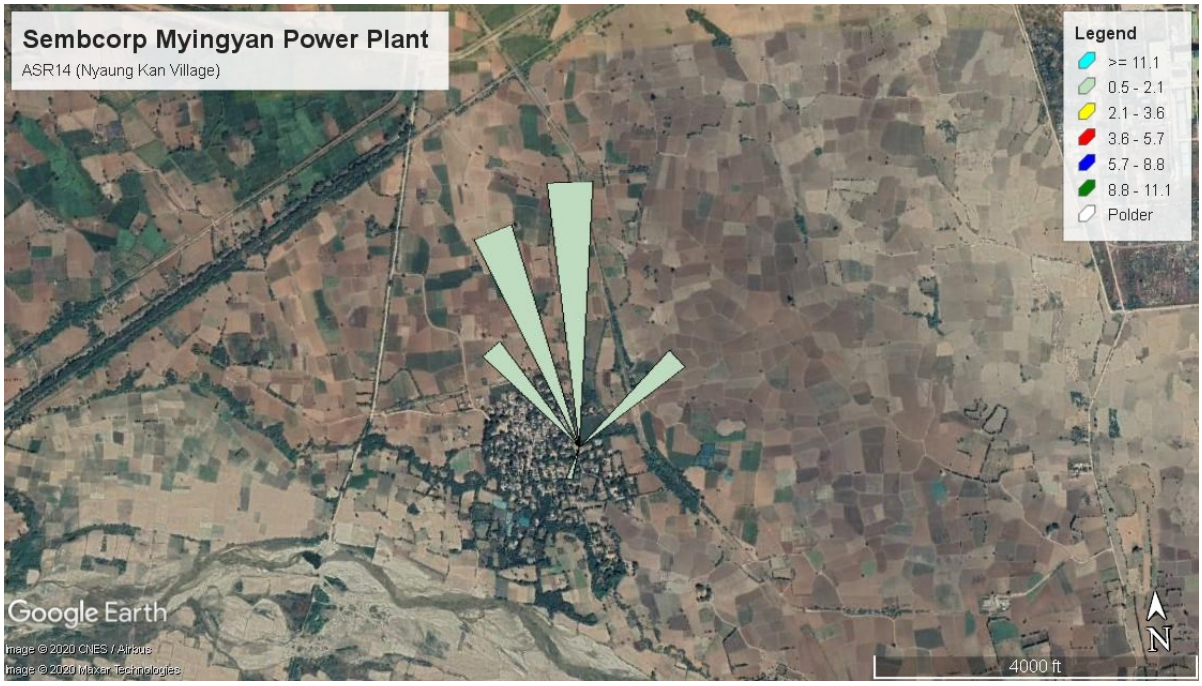

Figure 4. 15 Wind Speed and Wind Direction (Blowing From) at Nyaung Kan Village (ASR14)

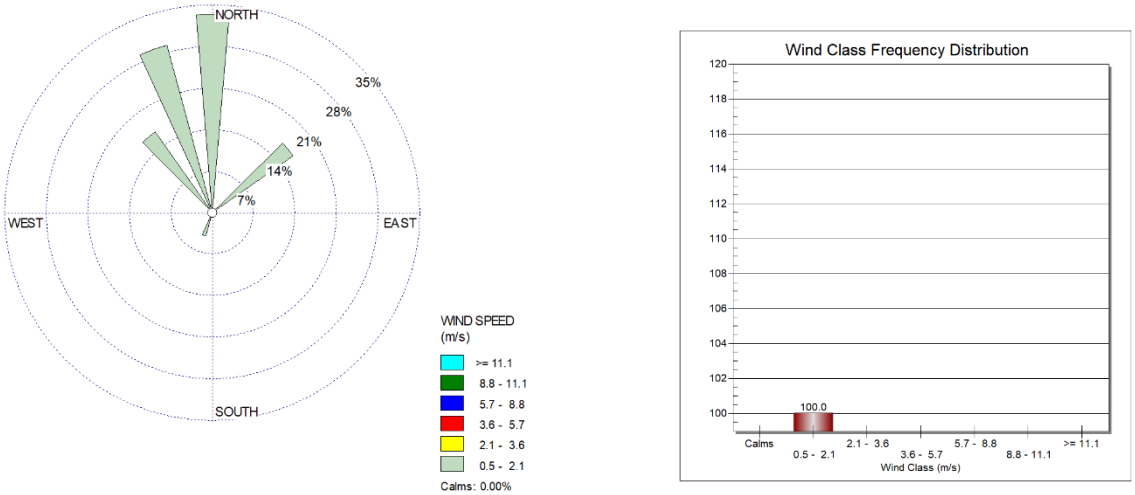

Figure 4. 16 Wind Class Frequency Distribution at Nyaung Kan Village (ASR14)

4.3 Ambient Noise

Ambient noise level for the proposed project was measured with Digital Sound Level Meter at the project site. The noise level measurement is conducted at Sembcorp Myingyan Power points: these points are nearly sembcop myingyan power plant and air monitoring point at Sa Ka village on 16 to 18 March 2020. Measuring period is 24 hours continuously. The observed values are described in **Table 4. 6 to Table 4. 9** and the following figures are noise level measurement at the proposed project.

Table 4. 6 Observed Values of Noise Level Measurement at near Sembcorp Myingyan Power Plant

No.	Date	Time	Observed Mean	Weight	Day/Night	Average

			Value (Source)			
1	18.03.2020	7:00:13-7:59:13	60.30	A	Day	
2	18.03.2020	8:00:13-8:59:13	62.04	A	Day	
3	17.03.2020	9:00:13-9:59:13	59.62	A	Day	
4	17.03.2020	10:00:13-10:59:13	60.05	A	Day	
5	17.03.2020	11:00:13-11:59:13	61.24	A	Day	
6	17.03.2020	12:00:13-12:59:13	64.42	A	Day	
7	17.03.2020	13:00:13-13:59:13	62.87	A	Day	
8	17.03.2020	14:00:13-14:59:13	64.09	A	Day	64.02
9	17.03.2020	15:00:13-15:59:13	65.11	A	Day	
10	17.03.2020	16:00:13-16:59:13	66.71	A	Day	
11	17.03.2020	17:00:13-17:59:13	66.80	A	Day	
12	17.03.2020	18:00:13-18:59:13	66.21	A	Day	
13	17.03.2020	19:00:13-19:59:13	66.94	A	Day	
14	17.03.2020	20:00:13-20:59:13	66.93	A	Day	
15	17.03.2020	21:00:13-21:59:13	67.00	A	Day	
16	17.03.2020	22:00:13-22:59:13	67.68	A	Night	
17	17.03.2020	23:00:13-23:59:13	68.06	A	Night	
18	18.03.2020	0:00:13-0:59:13	68.15	A	Night	
19	18.03.2020	1:00:13-1:59:13	65.98	A	Night	
20	18.03.2020	2:00:13-2:59:13	65.68	A	Night	64.01
21	18.03.2020	3:00:13-3:59:13	61.42	A	Night	
22	18.03.2020	4:00:13-4:59:13	60.22	A	Night	
23	18.03.2020	5:00:13-5:59:13	59.25	A	Night	
24	18.03.2020	6:00:13-6:59:13	59.68	A	Night	
Average			**64.02**			

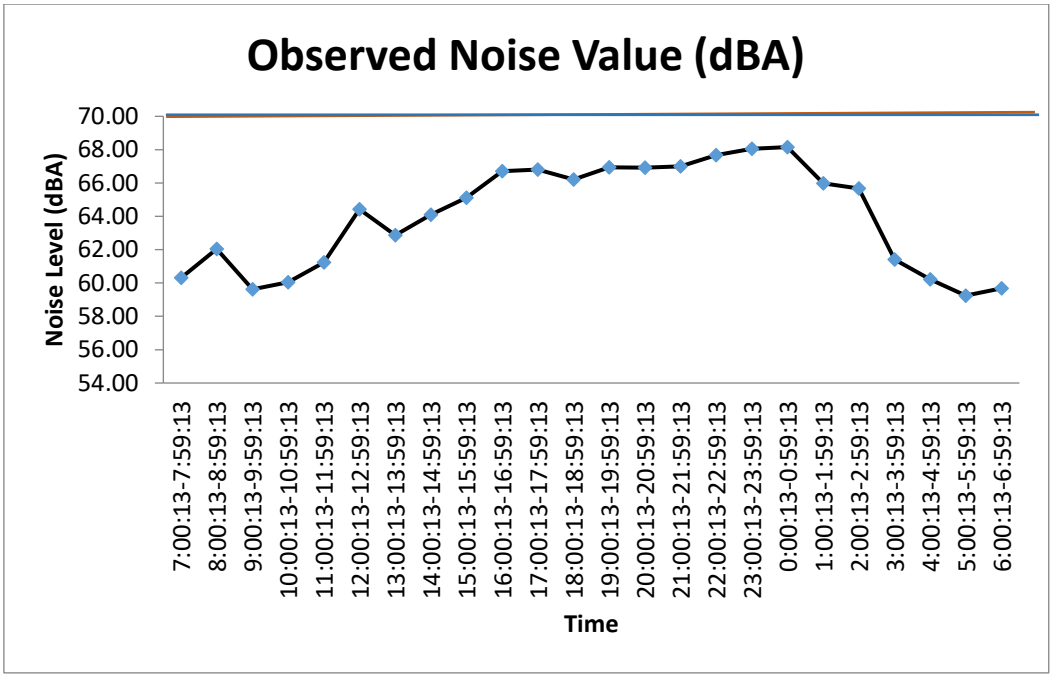

Figure 4. 17 Noise Level at near Sembcorp Myingyan Power Plant

Table 4. 7 Observed Values of Noise Level Measurement at Sa Ka Village

No.	Date	Time	Observed Mean Value (Source)	Weight	Day/Night	Average
1	17.03.2020	7:00:13-7:59:13	57.71	A	Day	53.24
2	17.03.2020	8:00:13-8:59:13	57.59	A	Day	
3	16.03.2020	9:00:13-9:59:13	56.98	A	Day	
4	16.03.2020	10:00:13-10:59:13	53.73	A	Day	
5	16.03.2020	11:00:13-11:59:13	49.91	A	Day	
6	16.03.2020	12:00:13-12:59:13	49.27	A	Day	
7	16.03.2020	13:00:13-13:59:13	48.95	A	Day	
8	16.03.2020	14:00:13-14:59:13	48.20	A	Day	
9	16.03.2020	15:00:13-15:59:13	53.21	A	Day	
10	16.03.2020	16:00:13-16:59:13	52.09	A	Day	
11	16.03.2020	17:00:13-17:59:13	51.78	A	Day	
12	16.03.2020	18:00:13-18:59:13	57.23	A	Day	
13	16.03.2020	19:00:13-19:59:13	53.10	A	Day	
14	16.03.2020	20:00:13-20:59:13	53.35	A	Day	
15	16.03.2020	21:00:13-21:59:13	55.44	A	Day	
16	16.03.2020	22:00:13-22:59:13	56.89	A	Night	53.10
17	16.03.2020	23:00:13-23:59:13	53.51	A	Night	
18	17.03.2020	0:00:13-0:59:13	51.39	A	Night	
19	17.03.2020	1:00:13-1:59:13	51.59	A	Night	
20	17.03.2020	2:00:13-2:59:13	47.38	A	Night	

21	17.03.2020	3:00:13-3:59:13	48.37	A	Night	
22	17.03.2020	4:00:13-4:59:13	50.27	A	Night	
23	17.03.2020	5:00:13-5:59:13	59.80	A	Night	
24	17.03.2020	6:00:13-6:59:13	58.68	A	Night	
Average			**53.18**			

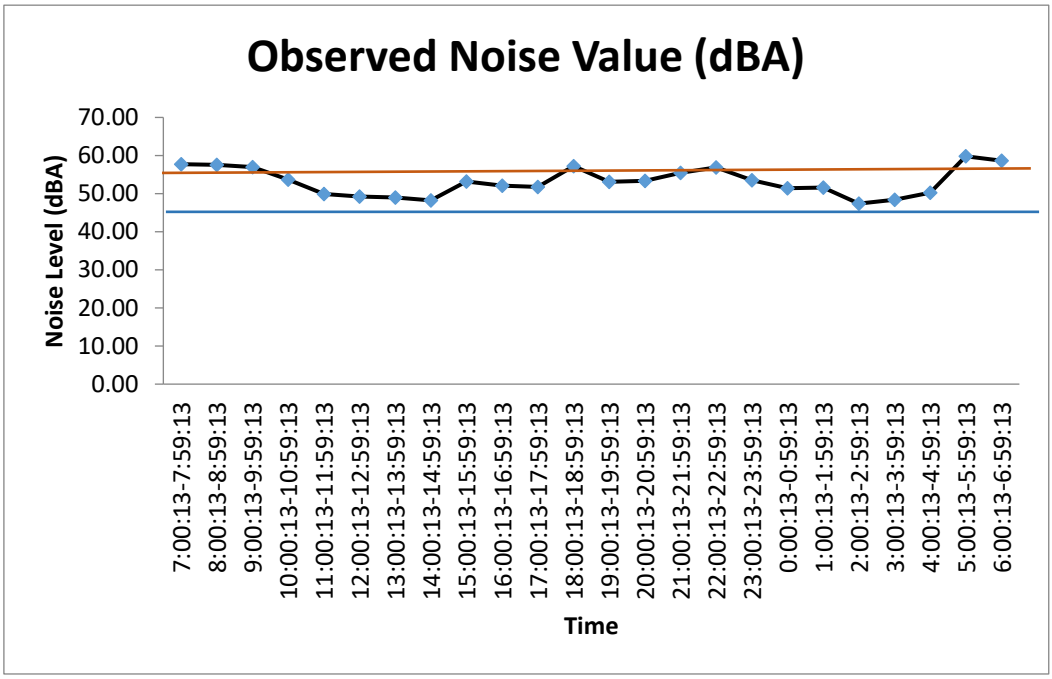

Figure 4. 18 Noise Level at Sa Ka Village

Table 4. 8 Observed Ambient Noise level Results from Myingyan Power Plant

Point	**Sembcorp Myingyan Power Plant**	
	Day Time	Night Time
Sembcorp Myingyan Power Plant	64.02	64.01
Guideline Values	70	70

Table 4. 9 Observed Ambient Noise level Results from Sa Ka Village

Point	**Sembcorp Myingyan Power Plant**	
	Day Time	Night Time
Sa Ka Village	53.24	53.10
Guideline Values	55	45

The observed values are compared with the National Environmental Quality (Emission) Guidelines as shown in **Table 4. 10** which indicates the separate level for residential and industrial points.

Table 4. 10 National Environmental Quality (Emission) Guidelines Values for Noise Level

Receptor	One Hour LAeq (dBA)	
	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

The observed values of the proposed project for daytime at Sembcorp myingyan power plant and Sa Ka village are 64.02 dB (A) and 53.24 dB (A). The observed values of the proposed project for night time at Sembcorp myingyan power plant and Sa Ka village are 64.01 dB (A) and 53.10 dB (A). The proposed project is located adjacent to the residential and commercial area. The observed values of daytime and nighttime at sembcorp myingyan power plant are under the National Environmental Quality (Emission) Guidelines. The observed values of daytime at Sa Ka Village is under the National Environmental Quality (Emission) Guidelines. The observed values of nighttime at Sa Ka village is upper the National Environmental Quality (Emission) Guidelines because this monitoring location is Sa Ka North Monastery. This monastery have near road. This road is passing through motor cycle and cars. So, the observed values of nighttime at Sa Ka village is upper the National Environmental Quality (Emission) Guidelines. But, Sa Ka village is acceptable Applicable Operational Noise Criteria of 54 dB (A) from ESIA Report.

APPENDIX A

Description of Haz-scanner (EPAS)

Publication 1601 Rev 1406

HAZ-SCANNER EPAS

Wireless Environmental Perimeter Air Station

HAZ-SCANNER EPAS shown with optional solar panels

Performance Profile

The HAZ-SCANNER EPAS is optimized for ambient air applications; custom calibration for specific ranges or applications is available upon request.

Display	LCD real time
Operation	4-key splash-proof membrane switch
Power	12-V Absorption Glass Mat (AGM) rechargable battery, 100-240 V AC, or optional solar panel
Display Measurements	Max, Min, TWA, STEL
Recording Time	1 sec to 21 weeks
Sampling Rate	1 sec, 1 min, 10 min, 1 hr, adjustable
Data Storage	450,560 data points
Sampling Pump	1.0 to 3.0 L/min
Digital Output	RS-232 (PC), RS-422 (Mac)
Software	PC or Mac
Dimensions (weather-proof case)	6 x 14 x 10 in (15.2 x 35.6 x 25.4 cm)
Weight	12 lbs (5.4 kg)
Operating Temperature	23 to 122 F (-5 to 50 C)
Storage Temperature	-40 to 140 F (-40 to 60 C)
Humidity	95% non-condensing (use inlet heater)
Wireless Radio Modem	900 MHz (U.S.), 868 MHz (Euro) up to 5 miles - line of sight (optional)
Auxiliary Analog Input	0 to 2.5 VDC (1 channel for alternative meter)

Configure an EPAS for Up to 14 Simultaneous Measurements

The standard HAZ-SCANNER EPAS includes the monitor (calibrated for ambient air applications) with sensors/meters for PM10 or TSP, VOCs, temperature, humidity, and wind speed/direction in a NEMA 4 enclosure, acid gas scrubber, internal battery, universal 110-240 V AC battery charger, software, cables, and CD with instructions.

Configure the monitor with additional sensors/meters — up to 4 optional interchangable sensors with upgradable software and/or up to 4 EPAS-specific meters (listed below). **See page 3 for specifications.** ***Specify sensors and meters when ordering.***

- PM1.0, 2.5, or 4.0
- Ammonia (EC)
- Carbon Dioxide (NDIR)
- Carbon Monoxide (EC)
- Chlorine (EC)
- Ethylene Oxide (EL)
- Hydrocarbon (methane-specific, EC)
- Hydrocarbons (EC)
- Hydrogen Chloride (EL)
- Hydrogen Cyanide (EC)
- Hydrogen Sulfide (EC)
- Nitric Oxide (EC)
- Nitrogen Dioxide
- Oxygen
- Ozone
- Phosphine (EL)
- Sulfur Dioxide
- Rain
- Solar Radiance
- Sound and Noise
- Atomic Radiation
- ELF Radiation
- Barometric Pressure
- Dew Point Temperature
- Wet Bulb Temperature

Contact SKC to build an EPAS with available sensors/meters/calibration for your application!

SKC Inc. 724-941-9701 SKC West 714-992-2780 SKC Gulf Coast 281-859-8050 SKC South 434-852-7149
www.skcinc.com

HAZ-SCANNER EPAS

Wireless Environmental Perimeter Air Station

HAZ-SCANNER EPAS Sensor/Meter Specifications

Parameter	Sensor*	Measurement/ Concentration Range	Accuracy	Minimum Resolution	Display Resolution	Additional Information
Particulates	90° infrared light scattering	0 to 5000 µg/m³	Greater of < ± 10% of reading or 0.2% full scale	10 µg/m³	1 µg/m³	Measures particle sizes 10 µm or TSP (standard) or 1, 2.5, or 4 µm (optional) in the 0.1 to 100 µm size range
VOCs	PID (10.6 eV)	0 to 50,000 ppb (0 to 50 ppm)	Greater of < ± 10% of reading or 2% full scale	5 ppb	1 ppb	Minimum detection level is 0.01 ppm. Standard sensor
Toxic Gas: NH_3 - Ammonia	Gas-sensing semiconductor (GSS) technology	0 to 100 ppm	Greater of < ± 10% of reading or 2% full scale	< 0.2 ppm	0.1 ppm	Optional sensor
Toxic Gas: CO_2 - Carbon Dioxide	NDIR	0 to 5000 ppm	Greater of < ± 10% of reading or 2% full scale	50 ppm	1 ppm	Optional sensor
Toxic Gas: CO - Carbon Monoxide	Electrochemical	0 to 10,000 ppb (0 to 10 ppm)	Greater of < ± 10% of reading or 2% full scale	20 ppb	1 ppb	Optional sensor
Toxic Gas: Cl_2 - Chlorine	Electrochemical	0 to 100 ppm	Greater of < ± 10% of reading or 2% full scale	< 0.2 ppm	0.1 ppm	Optional sensor
Toxic Gas: (C_2H_4O) - Ethylene Oxide	Electrochemical	0 to 1500 ppm	Greater of < ± 10% of reading or 2% full scale	8 ppm	1 ppm	Optional sensor
Toxic Gas: Hydrocarbon, CH_4 - Methane-specific	NDIR	0 to 1% Vol., 0 to 10,000 ppm, 0 to 20% LEL	Greater of < ± 10% of reading or 2% full scale	± 50 ppm or 0.1% LEL	50 ppm/ 0.1% LEL	Optional sensor
Toxic Gas: (Non-methane) Hydrocarbons (HC)	NDIR	Calibrated for 0 to 20% LEL of selected gas	Greater of < ± 10% of reading or 2% full scale	± 50 ppm/ 0.1% LEL	50 ppm/ 0.1% LEL	Optional sensor - specify gas type when ordering: ethane, propane, butane, hexane, ethanol, ethylene, or ethylene oxide
Toxic Gas: HCl - Hydrogen Chloride	Electrochemical	0 to 100 ppm	Greater of < ± 10% of reading or 2% full scale	< 0.2 ppm	0.1 ppm	Optional sensor
Toxic Gas: HCN - Hydrogen Cyanide	Electrochemical	0 to 100 ppm	Greater of < ± 10% of reading or 2% full scale	< 0.2 ppm	0.1 ppm	Optional sensor
Toxic Gas: H_2S - Hydrogen Sulfide	Electrochemical	0 to 25 ppm	Greater of < ± 10% of reading or 2% full scale	< 0.15 ppm	0.1 ppm	Optional sensor
Toxic Gas: NO - Nitric Oxide	Electrochemical	0 to 100 ppm	Greater of < ± 10% of reading or 2% full scale	< 0.2 ppm	0.1 ppm	Optional sensor
Toxic Gas: NO_2 - Nitrogen Dioxide	Electrochemical	0 to 5000 ppb (0 to 5 ppm)	Greater of < ± 10% of reading or 2% full scale	5 ppb	1 ppb	Optional sensor
Toxic Gas: O_2 - Oxygen	Electrochemical	0 to 30% Vol.	Greater of < ± 10% of reading or 2% full scale	0.6%	0.1%	Optional sensor
Toxic Gas: O_3 - Ozone	Gas-sensing semiconductor (GSS) technology	0 to 150 ppb (0 to 0.15 ppm), 0 to 500 ppb (0 to 0.5 ppm)	Greater of < ± 10% of reading or 2% full scale	1 ppb	1 ppb	Optional sensor
Toxic Gas: PH_3 - Phosphine	Electrochemical	0 to 100 ppm	Greater of < ± 10% of reading or 2% full scale	< 0.2 ppm	0.1 ppm	Optional sensor
Toxic Gas: SO_2 - Sulfur Dioxide	Electrochemical	0 to 5000 ppb (0 to 5 ppm) for ambient applications	Greater of < ± 10% of reading or 2% full scale	5 ppb	1 ppb	Optional sensor

* Not approved for intrinsically safe applications; do not use in explosive gas environments.

Specifications continued on next page

SKC Inc. 724-941-9701 SKC West 714-992-2780 SKC Gulf Coast 281-859-8050 SKC South 434-852-7149
www.skcinc.com

HAZ-SCANNER EPAS Sensor/Meter Specifications *(con't)*

Parameter	Sensor*	Measurement/ Concentration Range	Accuracy	Minimum Resolution	Display Resolution	Additional Information
Rain Fall/ Precipitation	Rain gauge (heated, tipping bucket)	0 to 5 inches daily	± 1% at 2 in/hr	0.01 in	0.01 in/tip	Optional meter
Temperature	NTC thermister	-4 to 140 F (-20 to 60 C)	Greater of ± 3% degree F or C of reading	1 degree F or C	1 degree F or C	Standard sensor
Relative Humidity (RH)	Thin-film capacitive	0 to 100% RH	± 2% RH	1% RH	1% RH	Standard sensor
Solar Radiance Intensity	Photodiode	1110 watts/ square meter (W/m²)	± 5% of full scale (reference Eppley PSP at 1000 W/m²)	1 W/m²	1 W/m²	Optional meter
Sound and Noise	Type 2 SLM	30 to 130 decibels (dB)	± 1.5 dB	0.1 dB	1 dB	Optional meter
Atomic Radiation	Geiger counter	1 to 19,999 counts per minute (cpm) or 0.001 to 100 milliRad/hr	± 10% Typical, ± 15% Max.	1 cpm or .001 mR/hr	1 cpm or .001 mR/hr	Optional meter
ELF Radiation	Sensor with single-axis probe	1 to 200 gauss (G)	± 10% or 5% FS	1 G	1 G	Optional meter
Wind Speed/ Direction	3-cut anemometer/ continuous rotation potentiometric wind direction vane	0 to 125 mph/ 5 to 355°	± 1 mph or ± 3%/± 3°	1 mph/1°	1 mph/1°	Standard sensor
Barometric Pressure	Piezo resistive	28.25 to 30.75 in Hg	± 0.09 in Hg	0.01 in Hg	0.01 in Hg	Optional sensor
Dew Point Temperature	Software calculation from RH and temperature	8.2 to 122 F (-16 to 50 C)	± 3 F	1 F	1 F	Optional meter - software calculated
Wet Bulb Temperature	Capsulated thermistor with wick	8.2 to 122 F (-16 to 50 C)	± 3 F	1 F	1 F	Optional meter - one meter

* Not approved for intrinsically safe applications; do not use in explosive gas environments.

Calibration Certificate for Haz-scanner

NANOVA CO., LTD.
Medical Scientific Industrial

Calibration Certificate

Customer	Eguard
System Model	EPAS
System Serial	915081
Calibration Date	2018 April 21

Sensor	Low	Actual	High	Actual
CO	0 ppm	0 ppm	10 ppm	8.2 ppm
CO2	0 ppm	0 ppm	300 ppm	250 ppm
SO2	0 ppm	0 ppm	2 ppm	1.5 ppm
NO2	0 ppm	0 ppm	3 ppm	2.1 ppm
PMA	0 ug/m3	0 ug/m3	23400 ug/m3	21100 ug/m3
PMB	0 ug/m3	0 ug/m3	21000 ug/m3	19100 ug/m3

Temperature **22 deg C**
Relative Humidity **32%**

Note
 # Perform by EDC technican's instruction.
 # This instrument is manufactured by Environmenatl Device Corporation (USA).

Environmental
Devices Corporation

Perform by

Nanda Maung	Technical Service Engineer	Nanova Co;ltd

Yangon Ofice
22A , Shan Yeik Thar Street , Sanchaung Township.
01-2304901 , 01-2304902
Help Line - 09977477774

APPENDIX B

Field Photos

Air Monitoring Point at Sa Ka Village (ASR4) Lat- 21°23’48.591”, Long- 95°23’0.849” 16.3.2020 to 17.3.2020	
Air Monitoring Point at Hnan Ywa Village (ASR3) Lat- 21°22’17.565”, Long- 95°23’18.116” 17.3.2020 to 18.3.2020	

Air Monitoring Point at Gyoke Pin Village (ASR5) Lat- 21°24’21.888”, Long- 95°21’07.381” 18.3.2020 to 19.3.2020	
Air Monitoring Point at Nyaung Kan Village (ASR14) Lat- 21°21’58.048”, Long- 95°20’51.346” 19.3.2020 to 20.3.2020	

Sembcorp Myingyan Power Co., Ltd.

Environmental Monitoring Report

(Air Quality Monitoring)

Prepared by

Ref: 29.06.2020 to 03.07.2020 (Air Quality Report)

27 July 2020

E Guard Environmental Services

Table of Contents

List of Figures

List of Tables

1. INTRODUCTION

This report is environmental monitoring (only air and noise quality monitoring) for Sembcorp Myingyan Power Plant which is located beside of Myingyan – Nyaung-Oo Road, near the Sa Ka village in Mandalay Region.

2. METHODOLOGY

Baseline environmental parameters and sampling locations were defined according to the objectives for environmental monitoring purposes. Locations for sampling and analysis of ambient air quality of the project site were identified by Sembcorp Myingyan Power Co,ltd.

2.1 Ambient Air Quality

The emissions of dust particles and gases were measured for 24hrs continuously at the selected sites by using the Environmental Perimeter Air Station (EPAS), and EPAS provides direct readings in real time with data-logging capabilities. The monitoring results were compared with National Environmental Quality (Emission) Guideline (NEQG), World Health Organization (WHO) and American Conference of Governmental Industrial Hygienists (ACGIH) guidelines.

Table 2. 1 Ambient Air Quality Parameters

Ambient Air Quality (4 locations)	
Gas Emission	CO, CO_2, SO_2, NO_2
Dust Emission	PM_{10}, $PM_{2.5}$

Table 2. 2 Air Quality Guideline Values

Parameters	Guidelines Value	Unit	Organization	Averaging Period
PM_{10}	50	$\mu g/m^3$	NEQ	24hrs
$PM_{2.5}$	25	$\mu g/m^3$	NEQ	24hrs
CO	9	ppm	NAAQS	8hrs
CO_2	5000	ppm	ACGIH	8hrs
SO_2	20	$\mu g/m^3$	NEQ	24hrs
NO_2	200	$\mu g/m^3$	NEQ	24hrs

Source: Myanmar National Environmental Quality (Emission) Guidelines, December 2015 & Air quality guidelines global update. 2005. World Health Organization.

2.2 Ambient Noise

Noise level LAeq (dBA) will be measured at the selected locations that can reflect the exposure of the nearest local community and sensitive locations. Duration and frequency were measured for 24hrs continuously at the selected site using the Noise Meter.

The monitoring procedures, data analysis and interpretation were carried out in accordance with the instrument's manufacture and National Environmental Quality (Emission) Guidelines, World Health Organization (WHO) and International Finance Corporation (IFC guidelines in order to be in line with Environmental Conservation Department, Ministry of Natural Resources and Environment Conservation (MONREC). "National Environmental Quality

(Emission) Guidelines" for Myanmar was also presented the value of noise level as LAeq (dBA).

Table 2. 3 Noise level monitoring

Noise monitoring (2 locations)	
Noise Emission	LAeq (dBA) (1hrs, 24 hrs.)

Equipment used to measure ambient air and noise measurement are shown below (**Table 2. 4**).

Table 2. 4 Equipment used to measure ambient air and noise measurement

Davis Vantage Pro2 Wireless Weather Station Provides detailed current weather conditions and expanded forecasts - all at a glance! The Vantage Pro2 uses a frequency-hopping spread spectrum radio from 902 MHz to 928 MHz to transmit and receive data up to 1,000' (300m) line of sight. In addition, the weather station features a bubble level, improved anemometer base, redesigned wind cups, and factory-calibrated wind direction. The integrated sensor suite combines temperature and humidity sensors, rain collector with an aluminum-plated tipping bucket, and anemometer into one package for easy setup. Measure inside and outside temperature and humidity, heat index, barometric pressure, dew point, rainfall, wind direction and speed, and wind chill.	
Haz-Scanner EPAS PM_{10}, PM $_{2.5}$, NO_2, SO_2, CO, CO_2, Temperature, and Relative Humidity	
Digital Sound Level Meter Noise and Vibration	

3. MONITORING LOCATIONS

Locations of sampling sites were identified by Sembcorp Myingyan Power Co,ltd. Air quality was monitored at the four selected locations that are Sa Ka Village (ASR4), Hnan Ywa Village (ASR3), Gyoke Pin Village (ASR 5) and Nyaung Kan Village (ASR 14).

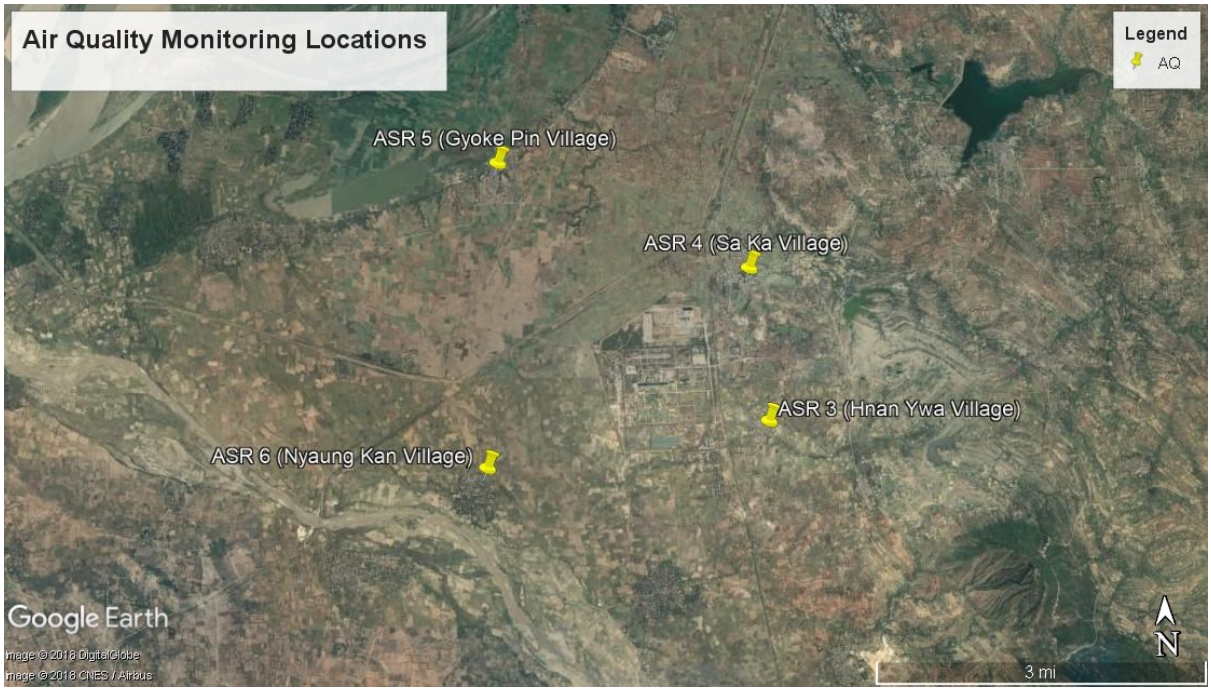

Figure 3. 1 Location of Monitoring Points

Table 3. 1 Location of Monitoring Points

Locations No.	Points	Coordinate	Locations
Ambient Air Quality and Noise Monitoring Locations			
1	ASR4	Lat- 21°23’48.591”, Long- 95°23’0.849”	Sa Ka Village
2	ASR3	Lat- 21°22’17.565”, Long- 95°23’18.116”	Hnan Ywa Village
3	ASR5	Lat- 21°24’21.888”, Long- 95°21’7.381”	Gyoke Pin Village
4	ASR14	Lat- 21°21’58.048”, Long- 95°20’51.346”	Nyaung Kan Village

4. ENVIRONMENTAL QUALITY MONITORING RESULTS

4.1 Ambient Air Quality Monitoring Results

24 hours air quality monitoring were done at each selected location from 29 June 2020 to 03 July 2020. The measured results are compared with national emission guidelines. Based on the results of air quality monitoring, most of the parameters are within the guidelines.

Table 4. 1 Observed Ambient Air Quality Results from Selected Points

Parameters	Observed Value				Guidelines Value	Unit	Averaging Period
	ASR4	ASR3	ASR5	ASR14			
PM_{10}	4.37	3.23	2.56	2.86	50	$\mu g/m^3$	24hrs
$PM_{2.5}$	2.09	1.47	1.20	1.51	25	$\mu g/m^3$	24hrs
CO	0	0	0	0	9	ppm	8hrs
CO_2	424.49	414.81	428.70	431.88	5000	ppm	8hrs
SO_2	0.01	0	0	0	20	$\mu g/m^3$	24hrs
NO_2	3.76	3.76	8.46	6.27	200	$\mu g/m^3$	1hrs

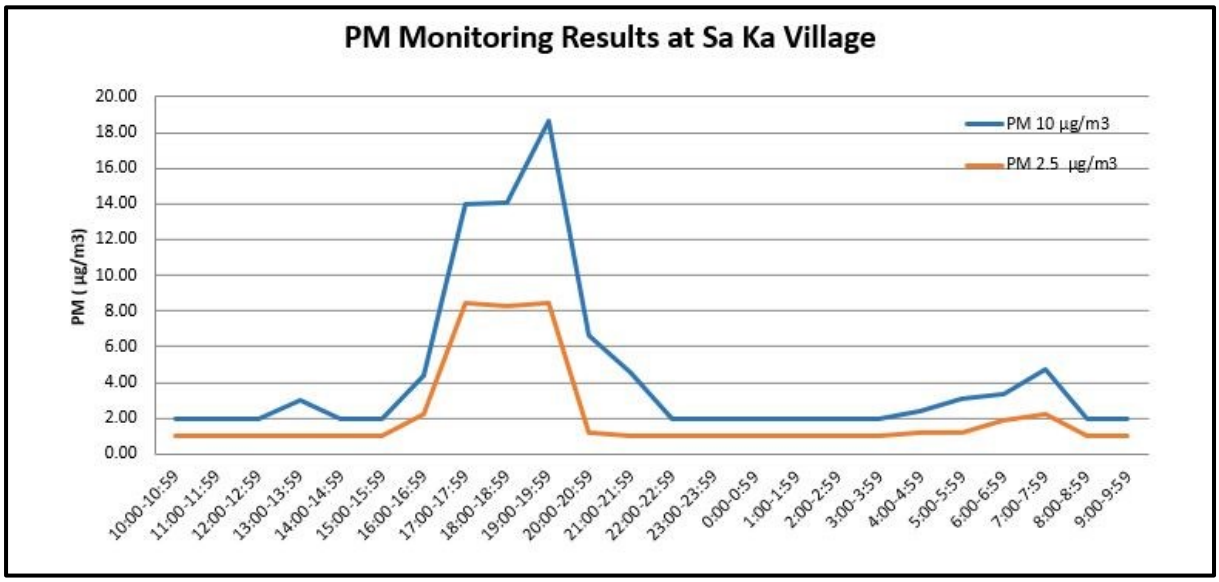

Figure 4. 1 PM Monitoring Results at Sa Ka Village

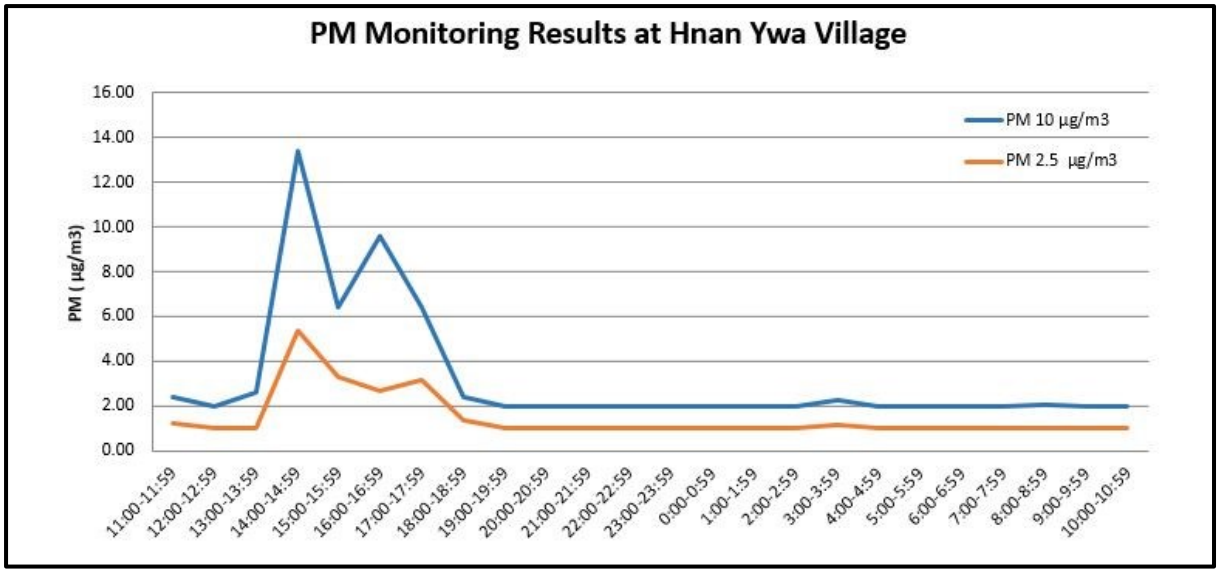

Figure 4. 2 PM Monitoring Results at Hnan Ywa Village

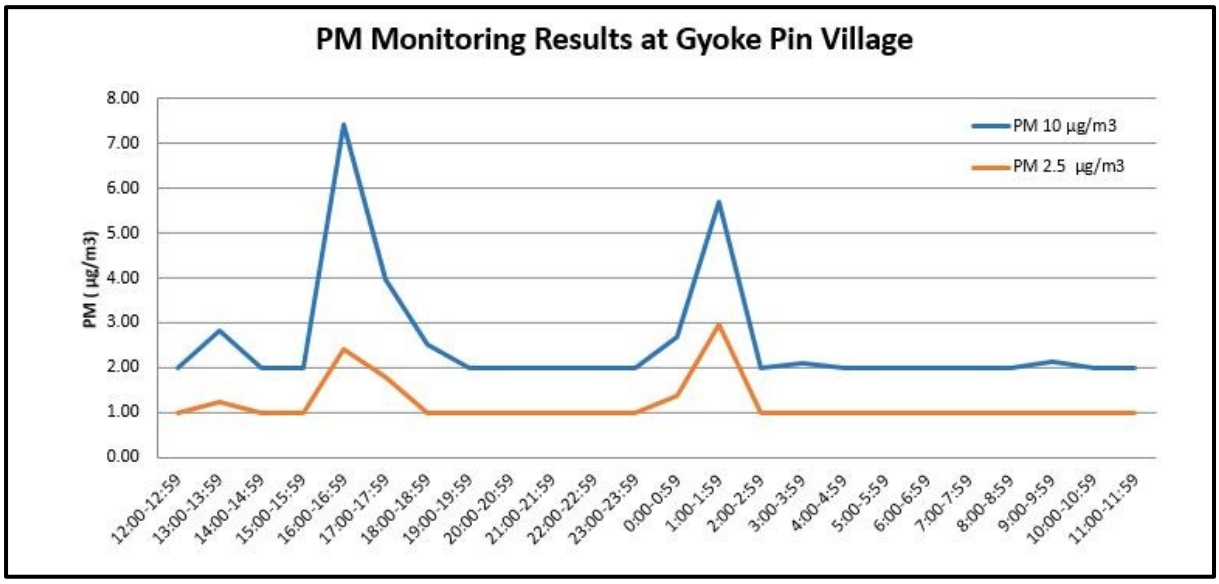

Figure 4. 3 PM Monitoring Results at Gyoke Pin Village

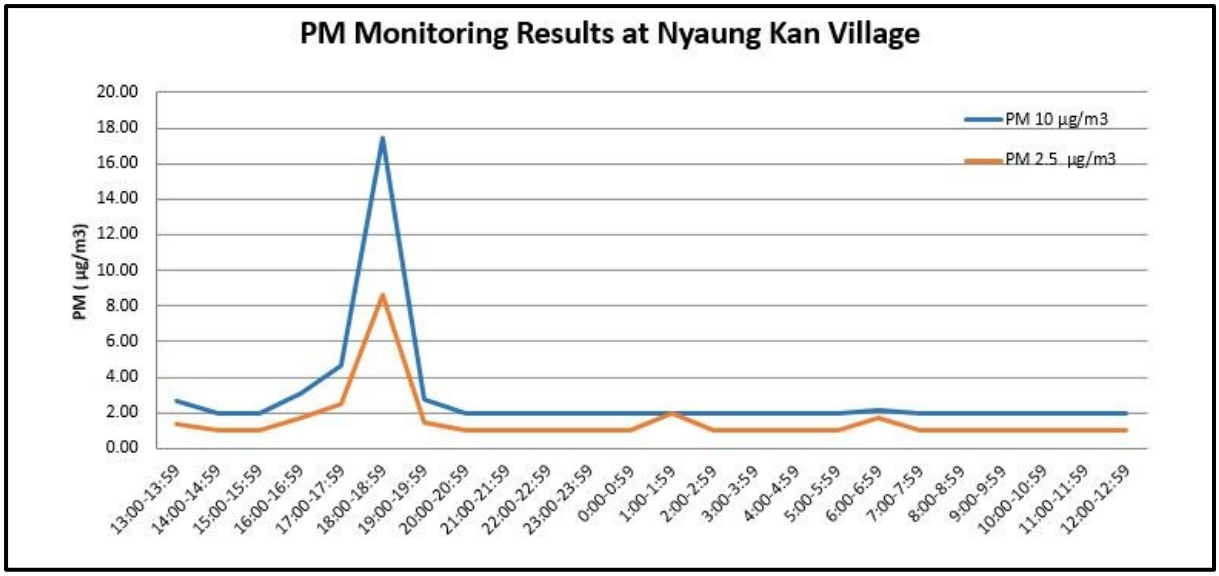

Figure 4. 4 PM Monitoring Results at Nyaung Kan Village

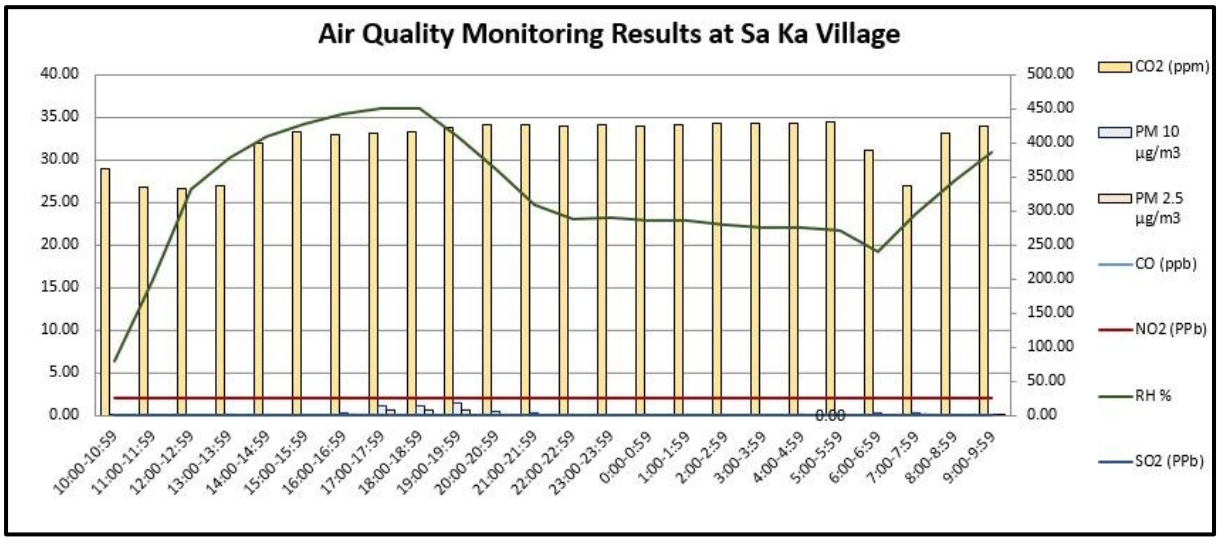

Figure 4. 5 Fluctuation of Air Pollutants during dial cycle (Sa Ka Village)

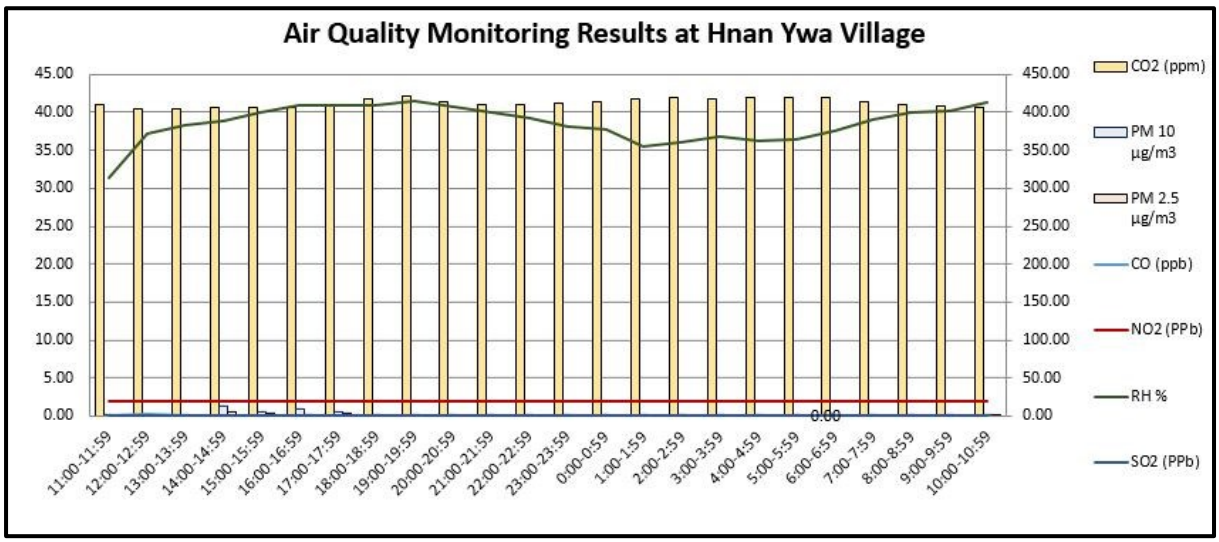

Figure 4. 6 Fluctuation of Air Pollutants during dial cycle (Hnan Ywa Village)

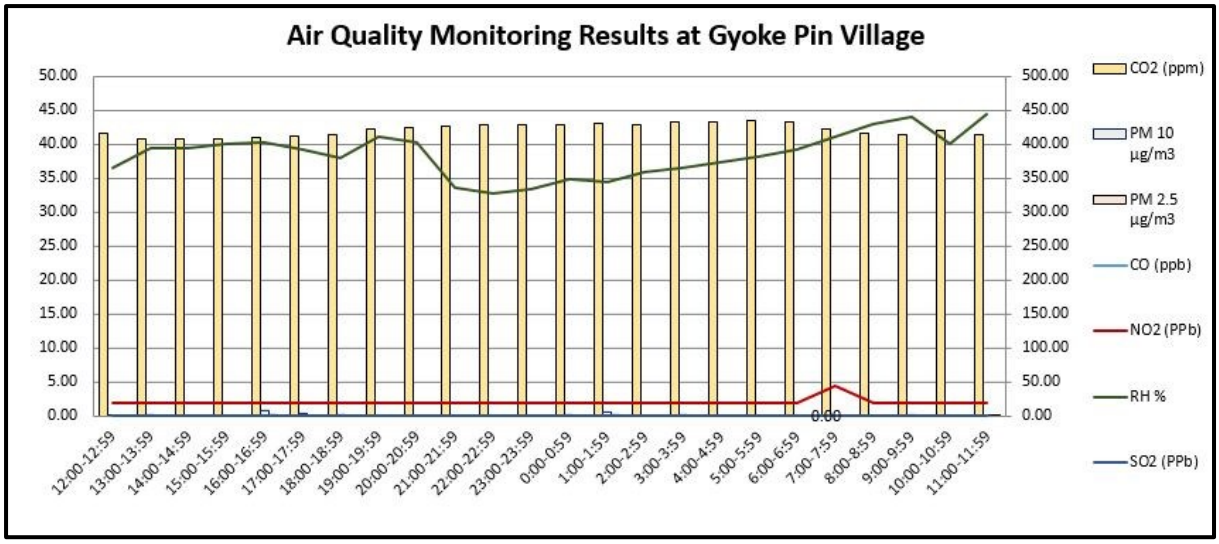

Figure 4. 7 Fluctuation of Air Pollutants during dial cycle (Gyoke Pin Village)

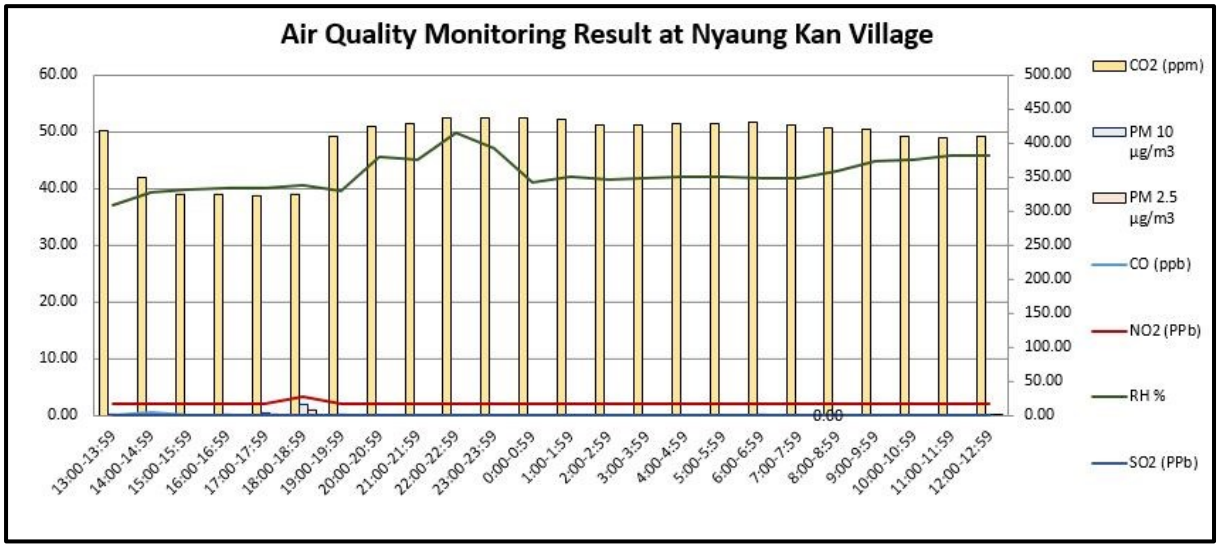

Figure 4. 8 Fluctuation of Air Pollutants during dial cycle (Nyaung Kan Village)

Detail results with one-hour interval of pollutants are shown in **Table 4. 2** to

01.7.2020	12:00-12:59	Average	416.72	0.00	2.00	2
01.7.2020	13:00-13:59	Average	408.75	0.00	2.00	2
01.7.2020	14:00-14:59	Average	407.38	0.00	2.00	2
01.7.2020	15:00-15:59	Average	408.37	0.00	2.00	2
01.7.2020	16:00-16:59	Average	409.13	0.00	2.00	7
01.7.2020	17:00-17:59	Average	411.30	0.00	2.00	3
01.7.2020	18:00-18:59	Average	414.68	0.00	2.00	2
01.7.2020	19:00-19:59	Average	423.45	0.00	2.00	2
01.7.2020	20:00-20:59	Average	424.78	0.00	2.00	2
01.7.2020	21:00-21:59	Average	426.68	0.00	2.00	2
01.7.2020	22:00-22:59	Average	428.88	0.00	2.00	2
01.7.2020	23:00-23:59	Average	428.48	0.00	2.00	2
02.7.2020	0:00-0:59	Average	429.05	0.00	2.00	2

02.7.2020	1:00-1:59	Average	430.25	0.00	2.00	5
02.7.2020	2:00-2:59	Average	429.35	0.00	2.00	2
02.7.2020	3:00-3:59	Average	432.12	0.00	2.00	2
02.7.2020	4:00-4:59	Average	433.15	0.00	2.00	2
02.7.2020	5:00-5:59	Average	434.52	0.00	2.00	2
02.7.2020	6:00-6:59	Average	432.57	0.00	2.00	2
02.7.2020	7:00-7:59	Average	422.37	0.00	4.50	2
02.7.2020	8:00-8:59	Average	417.33	0.00	2.00	2
02.7.2020	9:00-9:59	Average	415.07	0.00	2.00	2
02.7.2020	10:00-10:59	Average	419.82	0.00	2.00	2
02.7.2020	11:00-11:59	Average	414.15	0.00	2.00	2
Average			**421.60**	**0.00**	**2.10**	**2**
1 hour Minimum			407.38	0.00	2.00	2
1 hour Maximum			434.52	0.00	4.50	7

Table 4. 5**.** All results are under the Myanmar National Environmental Quality (emission) Guidelines. So, Sembcorp Myingyan Power Plant is acceptable for environment.

Table 4. 2 Air Monitoring Results (Sa Ka Village)

Date	Time		CO_2 (ppm)	CO (ppb)	NO_2 (ppb)	PM_{10} µg/m^3	$PM_{2.5}$ µg/m^3	RH %	SO_2 (ppb)
29.6.2020	10:00-10:59	Average	362.87	0.00	2.00	2.00	1.00	6.40	0.00
29.6.2020	11:00-11:59	Average	335.37	0.00	2.00	2.00	1.00	15.92	0.00
29.6.2020	12:00-12:59	Average	334.08	0.00	2.00	2.00	1.00	26.50	0.00
29.6.2020	13:00-13:59	Average	337.57	0.00	2.00	3.02	1.03	30.17	0.00
29.6.2020	14:00-14:59	Average	399.45	0.00	2.00	2.00	1.00	32.75	0.00
29.6.2020	15:00-15:59	Average	416.48	0.00	2.00	2.00	1.00	34.23	0.00
29.6.2020	16:00-16:59	Average	412.57	0.00	2.00	4.42	2.22	35.32	0.00
29.6.2020	17:00-17:59	Average	414.35	0.00	2.00	13.97	8.48	36.05	0.00
29.6.2020	18:00-18:59	Average	415.77	0.00	2.00	14.07	8.27	36.03	0.00
29.6.2020	19:00-19:59	Average	423.18	0.00	2.00	18.67	8.43	32.65	0.00
29.6.2020	20:00-20:59	Average	426.75	0.00	2.00	6.63	1.15	28.92	0.00
29.6.2020	21:00-21:59	Average	426.25	0.00	2.00	4.57	1.00	24.77	0.00
29.6.2020	22:00-22:59	Average	424.77	0.00	2.00	2.00	1.00	23.13	0.00
29.6.2020	23:00-23:59	Average	427.02	0.00	2.00	2.00	1.00	23.23	0.00
30.6.2020	0:00-0:59	Average	424.83	0.00	2.00	2.00	1.00	22.87	0.00
30.6.2020	1:00-1:59	Average	427.33	0.00	2.00	2.00	1.00	22.95	0.00
30.6.2020	2:00-2:59	Average	428.87	0.00	2.00	2.00	1.00	22.38	0.00
30.6.2020	3:00-3:59	Average	428.27	0.00	2.00	2.00	1.00	22.15	0.00
30.6.2020	4:00-4:59	Average	429.28	0.00	2.00	2.43	1.22	22.00	0.00
30.6.2020	5:00-5:59	Average	430.58	0.00	2.00	3.12	1.17	21.82	0.00
30.6.2020	6:00-6:59	Average	388.97	0.00	2.00	3.35	1.90	19.28	0.00
30.6.2020	7:00-7:59	Average	337.87	0.00	2.00	4.73	2.23	23.68	0.00
30.6.2020	8:00-8:59	Average	414.23	0.00	2.00	2.00	1.00	27.60	0.00
30.6.2020	9:00-9:59	Average	425.23	0.00	2.00	2.00	1.00	30.92	0.07
Average			**403.83**	**0.00**	**2.00**	**4.37**	**2.09**	**25.90**	**0.00**
1 hour Minimum			334.08	0.00	2.00	2.00	1.00	6.40	0.00
1 hour Maximum			430.58	0.00	2.00	18.67	8.48	36.05	0.07

Table 4. 3 Air Monitoring Results (Hnan Ywa Village)

Date	Time		CO_2 (ppm)	CO (ppb)	NO_2 (ppb)	PM_{10} µg/m^3	$PM_{2.5}$ µg/m^3	RH %	SO_2 (ppb)
30.6.2020	11:00-11:59	Average	410.37	0.00	2.00	2.38	1.23	31.45	0.00
30.6.2020	12:00-12:59	Average	404.90	0.30	2.00	2.00	1.00	37.20	0.00
30.6.2020	13:00-13:59	Average	403.93	0.00	2.00	2.63	1.00	38.25	0.00
30.6.2020	14:00-14:59	Average	405.78	0.00	2.00	13.43	5.38	38.87	0.00
30.6.2020	15:00-15:59	Average	406.75	0.00	2.00	6.40	3.28	40.05	0.00
30.6.2020	16:00-16:59	Average	407.03	0.00	2.00	9.57	2.67	40.90	0.00
30.6.2020	17:00-17:59	Average	408.70	0.00	2.00	6.38	3.18	41.00	0.00
30.6.2020	18:00-18:59	Average	417.08	0.00	2.00	2.40	1.33	41.00	0.00
30.6.2020	19:00-19:59	Average	420.82	0.00	2.00	2.00	1.00	41.40	0.00
30.6.2020	20:00-20:59	Average	413.13	0.00	2.00	2.00	1.00	40.83	0.00
30.6.2020	21:00-21:59	Average	410.15	0.00	2.00	2.00	1.00	40.00	0.00
30.6.2020	22:00-22:59	Average	410.82	0.00	2.00	2.00	1.00	39.18	0.00
30.6.2020	23:00-23:59	Average	412.60	0.00	2.00	2.00	1.00	38.12	0.00
01.7.2020	0:00-0:59	Average	413.87	0.00	2.00	2.00	1.00	37.70	0.00
01.7.2020	1:00-1:59	Average	418.00	0.00	2.00	2.00	1.00	35.55	0.00
01.7.2020	2:00-2:59	Average	419.07	0.00	2.00	2.00	1.00	36.13	0.00
01.7.2020	3:00-3:59	Average	418.42	0.00	2.00	2.23	1.17	36.88	0.00
01.7.2020	4:00-4:59	Average	419.82	0.00	2.00	2.00	1.00	36.25	0.00
01.7.2020	5:00-5:59	Average	419.43	0.00	2.00	2.00	1.00	36.43	0.00
01.7.2020	6:00-6:59	Average	420.07	0.00	2.00	2.00	1.00	37.58	0.00
01.7.2020	7:00-7:59	Average	414.43	0.00	2.00	2.00	1.00	39.02	0.00
01.7.2020	8:00-8:59	Average	409.80	0.00	2.00	2.03	1.00	40.03	0.00
01.7.2020	9:00-9:59	Average	407.65	0.00	2.00	2.00	1.00	40.12	0.00
01.7.2020	10:00-10:59	Average	407.12	0.00	2.00	2.00	1.00	41.28	0.00
Average			**412.49**	**0.01**	**2.00**	**3.23**	**1.47**	**38.55**	**0.00**
1 hour Minimum			403.93	0.00	2.00	2.00	1.00	31.45	0.00
1 hour Maximum			420.82	0.30	2.00	13.43	5.38	41.40	0.00

Table 4. 4 Air Monitoring Results (Gyoke Pin Village)

Date	Time		CO_2 (ppm)	CO (ppb)	NO_2 (ppb)	PM_{10} µg/m^3	$PM_{2.5}$ µg/m^3	RH %	SO_2 (ppb)
01.7.2020	12:00-12:59	Average	416.72	0.00	2.00	2.00	1.00	36.47	0.00
01.7.2020	13:00-13:59	Average	408.75	0.00	2.00	2.83	1.23	39.47	0.00
01.7.2020	14:00-14:59	Average	407.38	0.00	2.00	2.00	1.00	39.42	0.00
01.7.2020	15:00-15:59	Average	408.37	0.00	2.00	2.00	1.00	40.13	0.00
01.7.2020	16:00-16:59	Average	409.13	0.00	2.00	7.43	2.40	40.25	0.00
01.7.2020	17:00-17:59	Average	411.30	0.00	2.00	3.97	1.78	39.23	0.00
01.7.2020	18:00-18:59	Average	414.68	0.00	2.00	2.53	1.00	37.92	0.00
01.7.2020	19:00-19:59	Average	423.45	0.00	2.00	2.00	1.00	41.17	0.00
01.7.2020	20:00-20:59	Average	424.78	0.00	2.00	2.00	1.00	40.37	0.00
01.7.2020	21:00-21:59	Average	426.68	0.00	2.00	2.00	1.00	33.65	0.00
01.7.2020	22:00-22:59	Average	428.88	0.00	2.00	2.00	1.00	32.83	0.00
01.7.2020	23:00-23:59	Average	428.48	0.00	2.00	2.00	1.00	33.40	0.00
02.7.2020	0:00-0:59	Average	429.05	0.00	2.00	2.70	1.37	34.97	0.00
02.7.2020	1:00-1:59	Average	430.25	0.00	2.00	5.68	2.95	34.35	0.00
02.7.2020	2:00-2:59	Average	429.35	0.00	2.00	2.00	1.00	35.85	0.00
02.7.2020	3:00-3:59	Average	432.12	0.00	2.00	2.12	1.00	36.53	0.00
02.7.2020	4:00-4:59	Average	433.15	0.00	2.00	2.00	1.00	37.43	0.00
02.7.2020	5:00-5:59	Average	434.52	0.00	2.00	2.00	1.00	38.12	0.00
02.7.2020	6:00-6:59	Average	432.57	0.00	2.00	2.00	1.00	39.27	0.00
02.7.2020	7:00-7:59	Average	422.37	0.00	4.50	2.00	1.00	41.13	0.00
02.7.2020	8:00-8:59	Average	417.33	0.00	2.00	2.00	1.00	43.03	0.00
02.7.2020	9:00-9:59	Average	415.07	0.00	2.00	2.15	1.00	44.07	0.00
02.7.2020	10:00-10:59	Average	419.82	0.00	2.00	2.00	1.00	40.00	0.00
02.7.2020	11:00-11:59	Average	414.15	0.00	2.00	2.00	1.00	44.40	0.00
Average			**421.60**	**0.00**	**2.10**	**2.56**	**1.20**	**38.48**	**0.00**
1 hour Minimum			407.38	0.00	2.00	2.00	1.00	32.83	0.00
1 hour Maximum			434.52	0.00	4.50	7.43	2.95	44.40	0.00

Table 4. 5 Air Monitoring Results (Nyaung Kan Village)

Date	Time		CO_2 (ppm)	CO (ppb)	NO_2 (ppb)	PM_{10} µg/m3	$PM_{2.5}$ µg/m3	RH %	SO_2 (ppb)
02.7.2020	13:00-13:59	Average	419.25	0.00	2.00	2.65	1.37	36.97	0.00
02.7.2020	14:00-14:59	Average	348.82	0.50	2.00	2.00	1.00	39.33	0.00
02.7.2020	15:00-15:59	Average	324.23	0.00	2.00	2.00	1.00	39.90	0.00
02.7.2020	16:00-16:59	Average	324.67	0.00	2.00	3.07	1.68	40.12	0.00
02.7.2020	17:00-17:59	Average	322.12	0.00	2.00	4.68	2.52	40.00	0.00
02.7.2020	18:00-18:59	Average	324.08	0.00	3.33	17.40	8.62	40.68	0.00
02.7.2020	19:00-19:59	Average	409.38	0.00	2.00	2.75	1.48	39.63	0.00
02.7.2020	20:00-20:59	Average	424.97	0.00	2.00	2.00	1.00	45.58	0.00
02.7.2020	21:00-21:59	Average	428.87	0.00	2.00	2.00	1.00	44.98	0.00
02.7.2020	22:00-22:59	Average	436.97	0.00	2.00	2.00	1.00	49.75	0.00
02.7.2020	23:00-23:59	Average	436.88	0.00	2.00	2.00	1.00	47.18	0.00
03.7.2020	0:00-0:59	Average	436.20	0.00	2.00	2.00	1.00	41.20	0.00
03.7.2020	1:00-1:59	Average	434.83	0.00	2.00	2.00	1.95	41.98	0.00
03.7.2020	2:00-2:59	Average	426.40	0.00	2.00	2.00	1.00	41.58	0.00
03.7.2020	3:00-3:59	Average	426.30	0.00	2.00	2.00	1.00	41.85	0.00
03.7.2020	4:00-4:59	Average	428.60	0.00	2.00	2.00	1.00	42.00	0.00
03.7.2020	5:00-5:59	Average	428.73	0.00	2.00	2.00	1.00	42.17	0.00
03.7.2020	6:00-6:59	Average	430.38	0.00	2.00	2.13	1.73	41.83	0.00
03.7.2020	7:00-7:59	Average	427.33	0.00	2.00	2.00	1.00	41.93	0.00
03.7.2020	8:00-8:59	Average	422.35	0.00	2.00	2.00	1.00	43.03	0.00
03.7.2020	9:00-9:59	Average	420.03	0.00	2.00	2.00	1.00	44.73	0.00
03.7.2020	10:00-10:59	Average	410.57	0.00	2.20	2.00	1.00	45.07	0.00
03.7.2020	11:00-11:59	Average	408.42	0.00	2.00	2.00	1.00	45.92	0.00
03.7.2020	12:00-12:59	Average	409.40	0.00	2.00	2.00	1.00	45.85	0.00
Average			**404.57**	**0.02**	**2.06**	**2.86**	**1.51**	**42.64**	**0.00**
1 hour Minimum			322.12	0.00	2.00	2.00	1.00	36.97	0.00
1 hour Maximum			436.97	0.50	3.33	17.40	8.62	49.75	0.00

4.2 Wind Speed and Direction

The following figure describes the wind speed and wind direction of the proposed project site on, 29 June to 03 July 2020 respectively. According to the data, the wind direction is following **Figure 4. 9 to Figure 4. 16.**

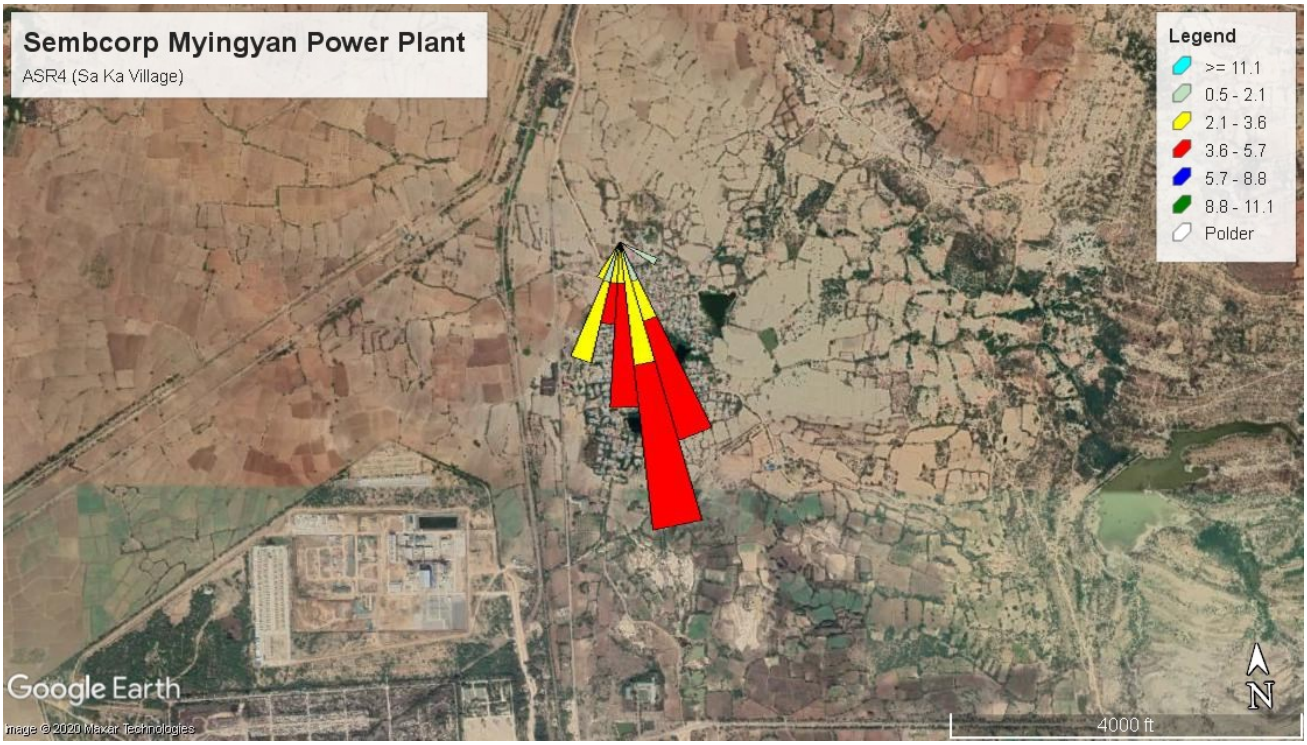

Figure 4. 9 Wind Speed and Wind Direction (Blowing From) at Sa Ka Village (ASR4)

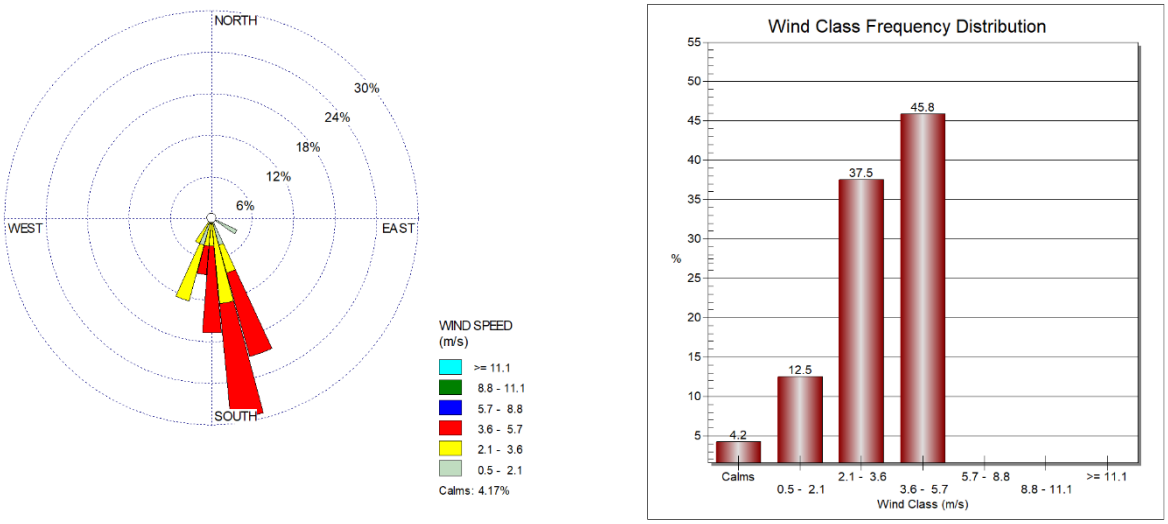

Figure 4. 10 Wind Class Frequency Distribution at Sa Ka Village (ASR4)

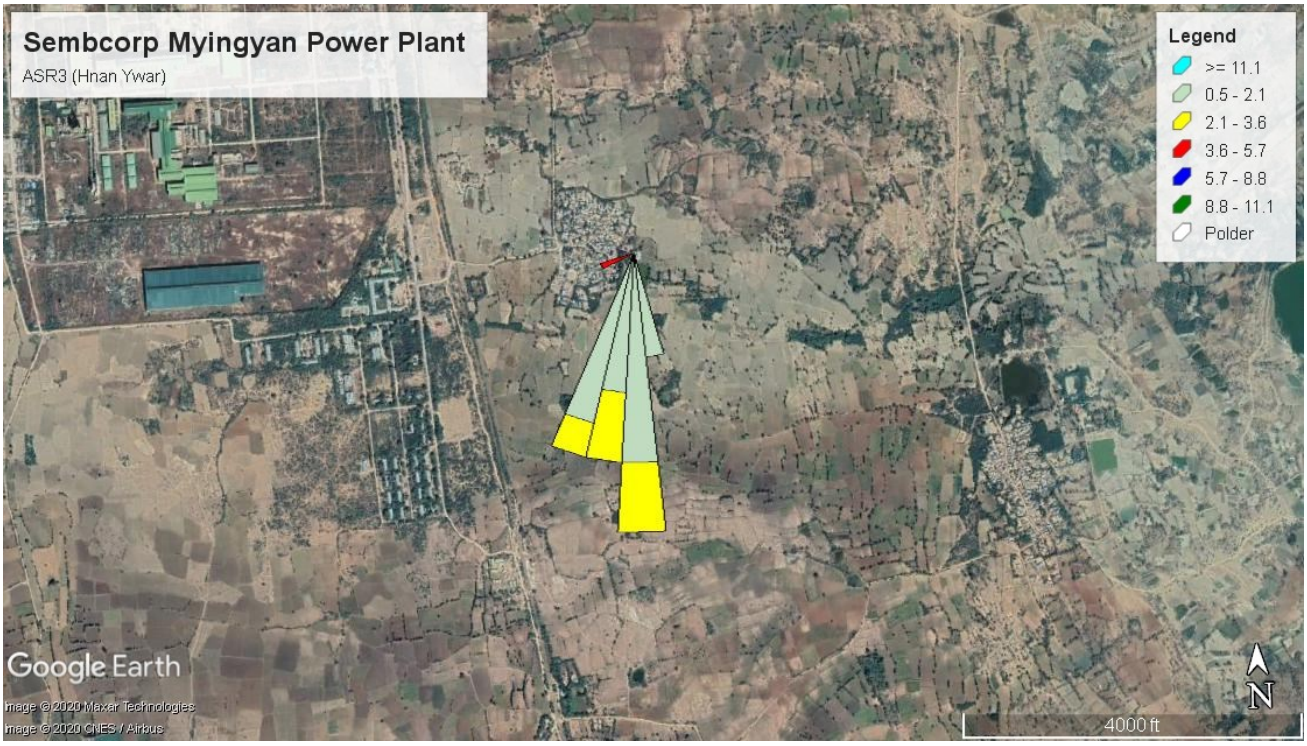

Figure 4. 11 Wind Speed and Wind Direction (Blowing From) at Hnan Ywa Village (ASR3)

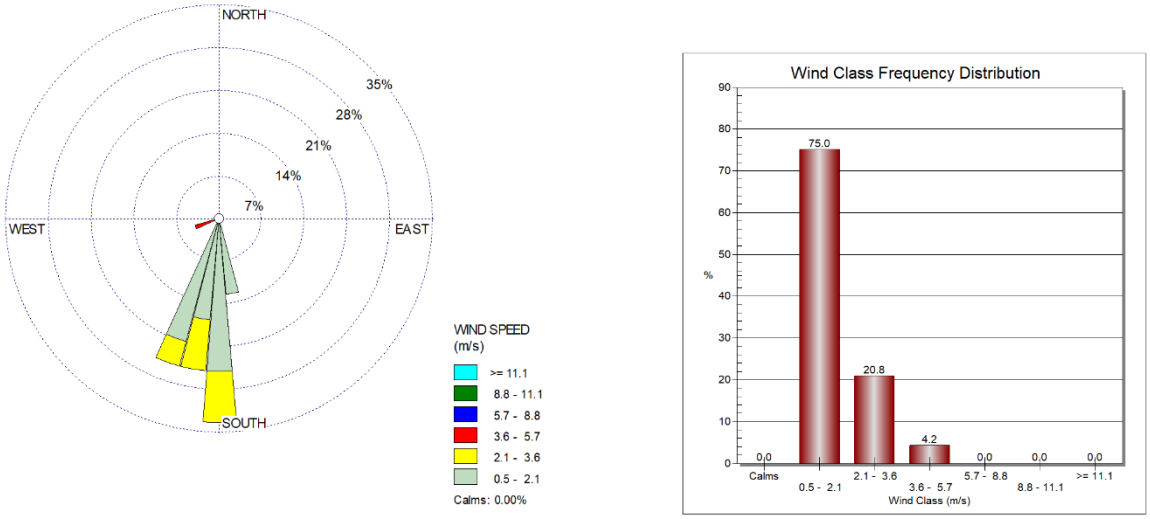

Figure 4. 12 Wind Class Frequency Distribution at Hnan Ywa Village (ASR3)

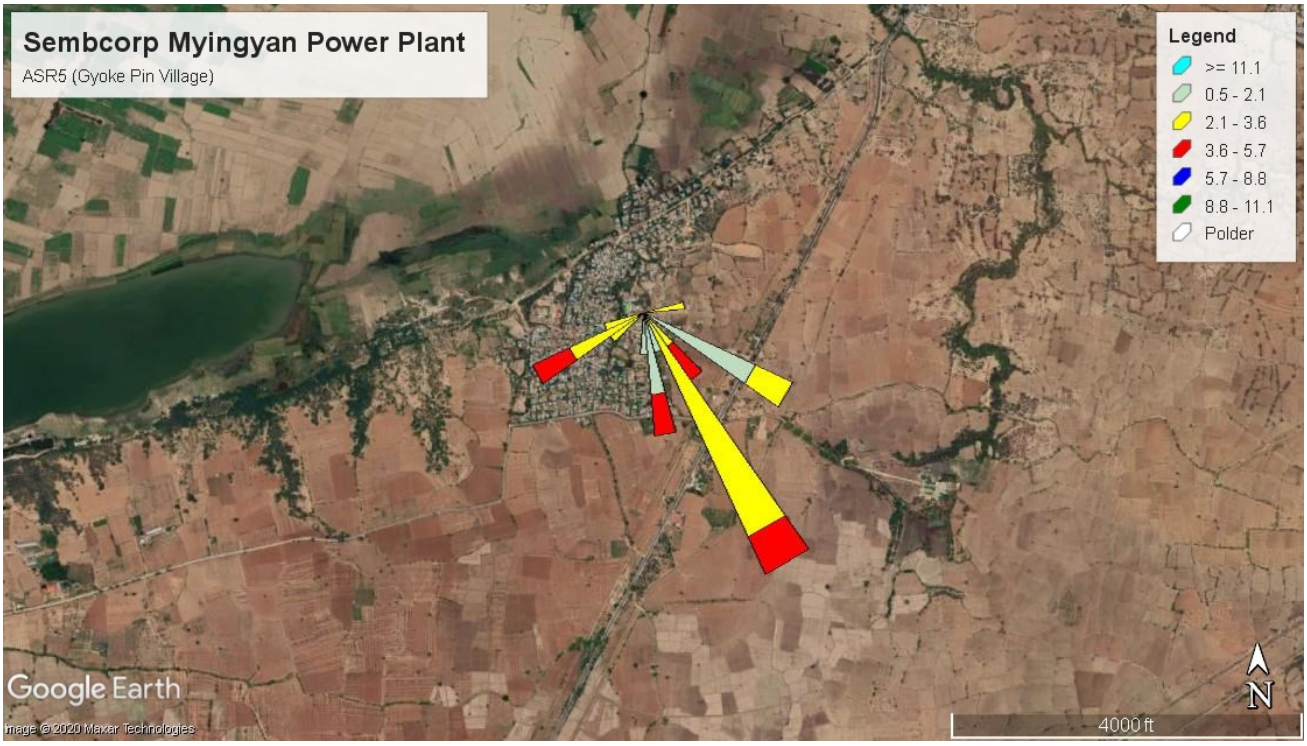

Figure 4. 13 Wind Speed and Wind Direction (Blowing From) at Gyoke Pin Village (ASR5)

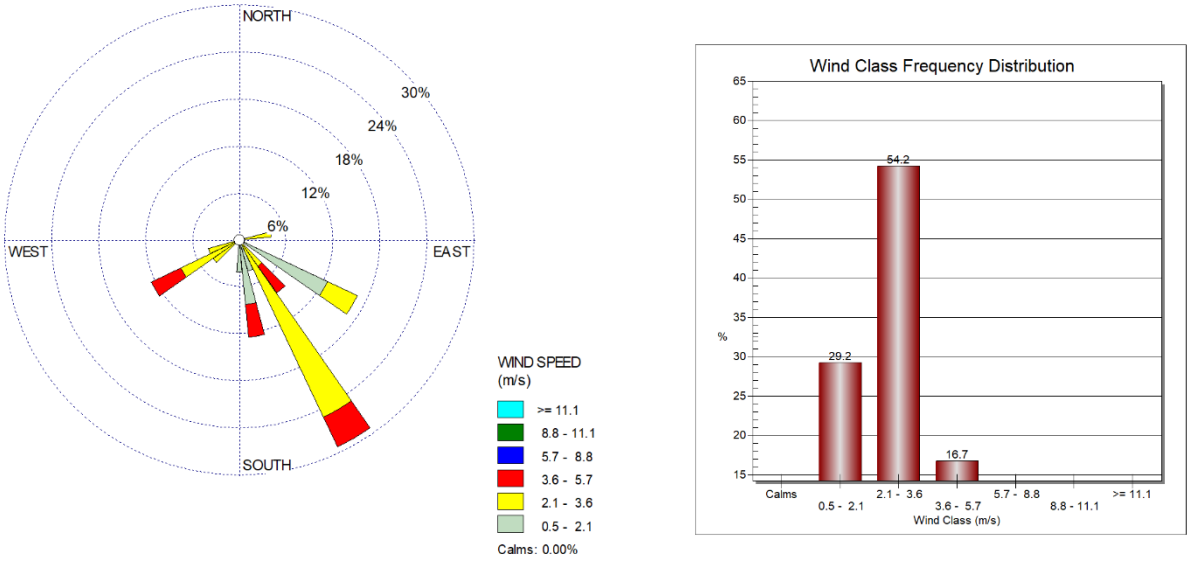

Figure 4. 14 Wind Class Frequency Distribution at Gyoke Pin Village (ASR5)

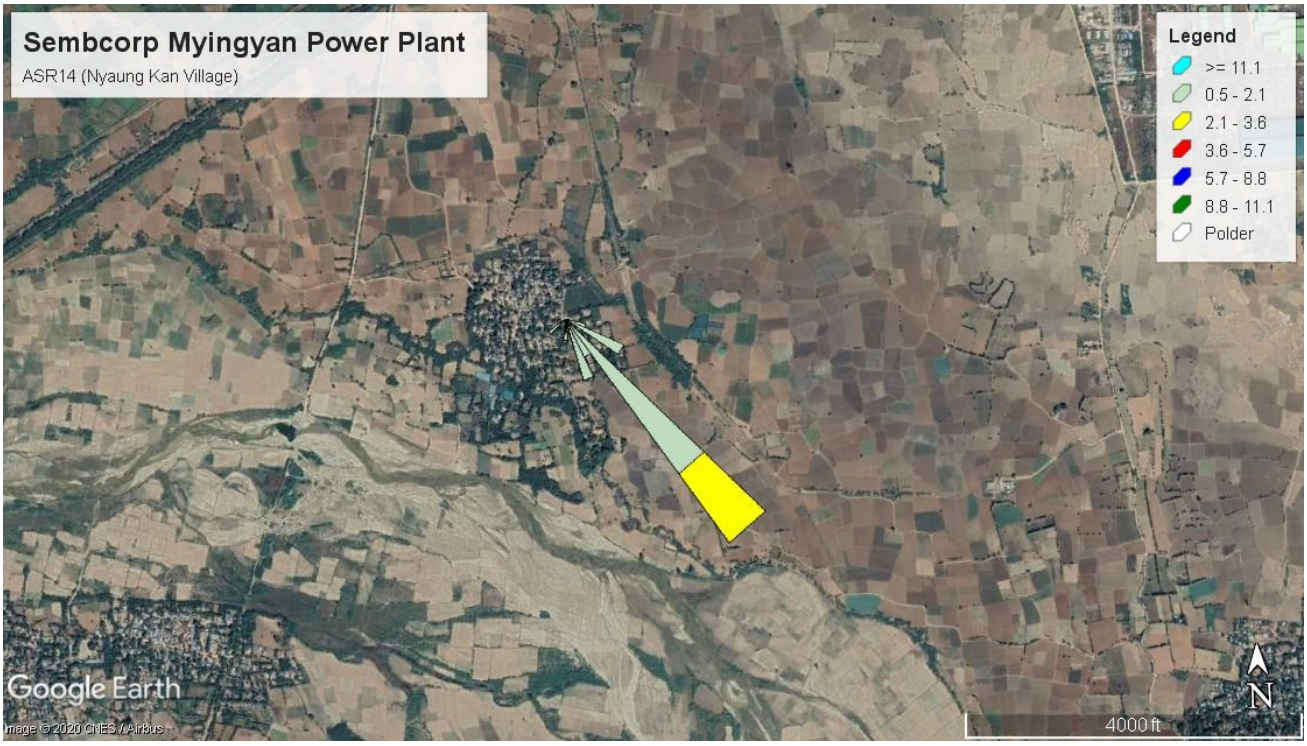

Figure 4. 15 Wind Speed and Wind Direction (Blowing From) at Nyaung Kan Village (ASR14)

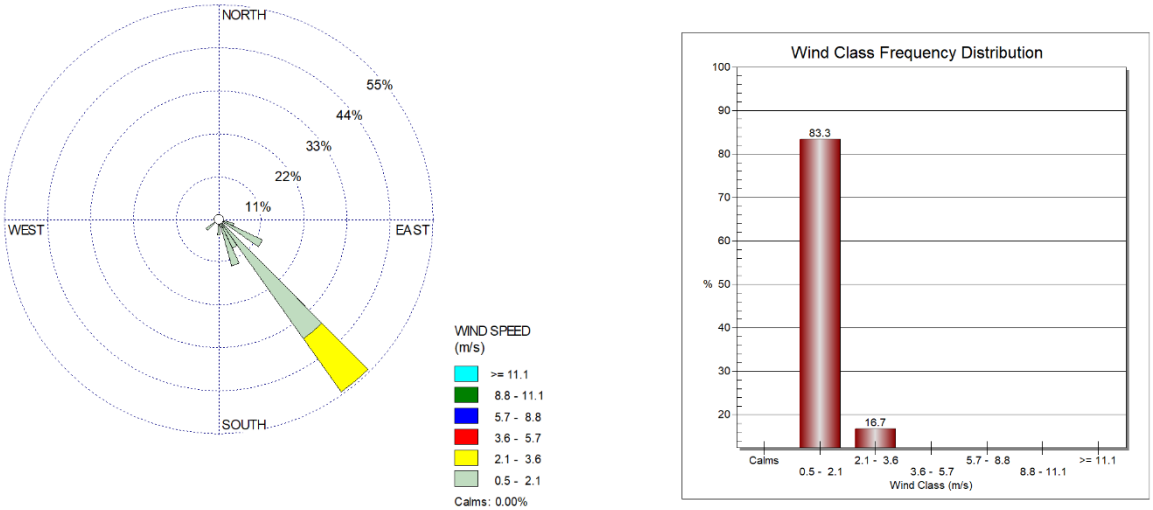

Figure 4. 16 Wind Class Frequency Distribution at Nyaung Kan Village (ASR14)

4.3 Ambient Noise

Ambient noise level for the proposed project was measured with Digital Sound Level Meter at the project site. The noise level measurement is conducted at Sembcorp Myingyan Power points: these points are nearly sembcorp myingyan power plant and air monitoring point at Sa Ka village on 29 June 2020 to 01 July 2020. Measuring period is 24 hours continuously. The observed values are described in **Table 4. 6 to Table 4. 9** and the following figures are noise level measurement at the proposed project.

Table 4. 6 Observed Values of Noise Level Measurement at near Sembcorp Myingyan Power Plant

No.	Date	Time	Observed Mean Value (Source)	Weight	Day/Night	Average
1	01.7.2020	7:00:13-7:59:13	44.38	A	Day	
2	01.7.2020	8:00:13-8:59:13	53.33	A	Day	
3	01.7.2020	9:00:13-9:59:13	49.30	A	Day	
4	01.7.2020	10:00:13-10:59:13	46.37	A	Day	
5	30.6.2020	11:00:13-11:59:13	44.72	A	Day	
6	30.6.2020	12:00:13-12:59:13	43.26	A	Day	
7	30.6.2020	13:00:13-13:59:13	52.01	A	Day	
8	30.6.2020	14:00:13-14:59:13	51.32	A	Day	48.90
9	30.6.2020	15:00:13-15:59:13	46.55	A	Day	
10	30.6.2020	16:00:13-16:59:13	50.04	A	Day	
11	30.6.2020	17:00:13-17:59:13	53.76	A	Day	
12	30.6.2020	18:00:13-18:59:13	53.84	A	Day	
13	30.6.2020	19:00:13-19:59:13	50.64	A	Day	
14	30.6.2020	20:00:13-20:59:13	46.84	A	Day	
15	30.6.2020	21:00:13-21:59:13	47.14	A	Day	
16	30.6.2020	22:00:13-22:59:13	44.83	A	Night	
17	30.6.2020	23:00:13-23:59:13	53.88	A	Night	
18	01.7.2020	0:00:13-0:59:13	47.35	A	Night	
19	01.7.2020	1:00:13-1:59:13	47.71	A	Night	
20	01.7.2020	2:00:13-2:59:13	54.41	A	Night	49.90
21	01.7.2020	3:00:13-3:59:13	53.37	A	Night	
22	01.7.2020	4:00:13-4:59:13	48.19	A	Night	
23	01.7.2020	5:00:13-5:59:13	51.10	A	Night	
24	01.7.2020	6:00:13-6:59:13	48.22	A	Night	
Average			**49.27**			

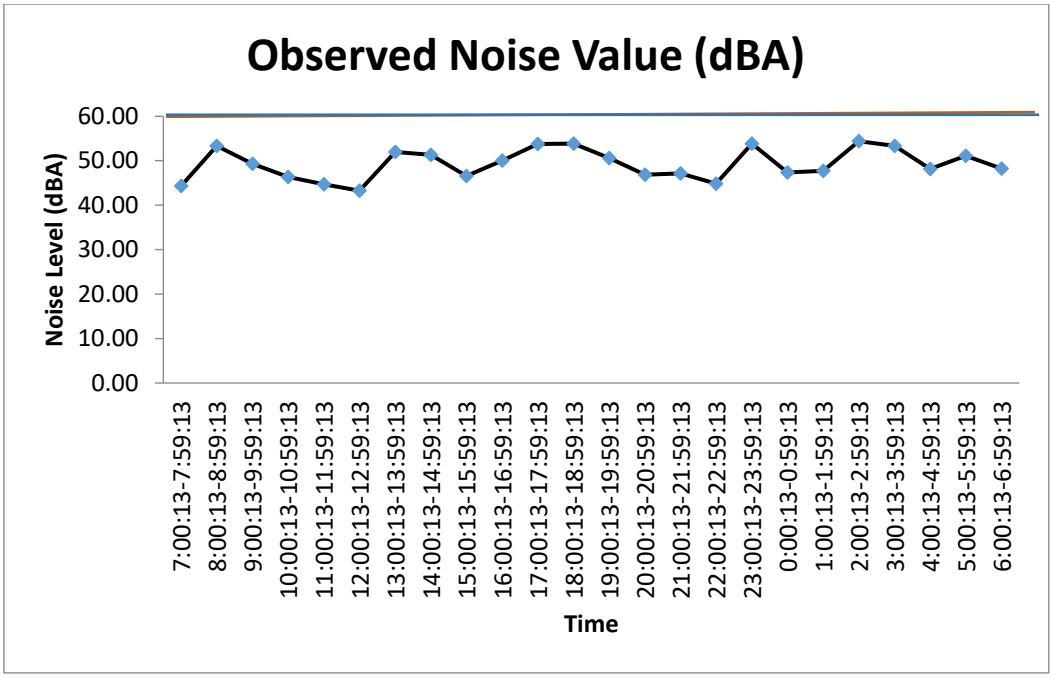

Figure 4. 17 Noise Level at near Sembcorp Myingyan Power Plant

Table 4. 7 Observed Values of Noise Level Measurement at Sa Ka Village

No.	Date	Time	Observed Mean Value (Source)	Weight	Day/Night	Average
1	30.6.2020	7:00:13-7:59:13	52.36	A	Day	45.71
2	30.6.2020	8:00:13-8:59:13	52.19	A	Day	
3	30.6.2020	9:00:13-9:59:13	52.26	A	Day	
4	29.6.2020	10:00:13-10:59:13	48.43	A	Day	
5	29.6.2020	11:00:13-11:59:13	43.27	A	Day	
6	29.6.2020	12:00:13-12:59:13	43.58	A	Day	
7	29.6.2020	13:00:13-13:59:13	41.92	A	Day	
8	29.6.2020	14:00:13-14:59:13	41.67	A	Day	
9	29.6.2020	15:00:13-15:59:13	39.25	A	Day	
10	29.6.2020	16:00:13-16:59:13	43.03	A	Day	
11	29.6.2020	17:00:13-17:59:13	45.14	A	Day	
12	29.6.2020	18:00:13-18:59:13	48.93	A	Day	
13	29.6.2020	19:00:13-19:59:13	47.39	A	Day	
14	29.6.2020	20:00:13-20:59:13	41.84	A	Day	
15	29.6.2020	21:00:13-21:59:13	44.36	A	Day	
16	29.6.2020	22:00:13-22:59:13	45.61	A	Night	48.74
17	29.6.2020	23:00:13-23:59:13	48.69	A	Night	
18	30.6.2020	0:00:13-0:59:13	49.45	A	Night	
19	30.6.2020	1:00:13-1:59:13	47.16	A	Night	
20	30.6.2020	2:00:13-2:59:13	47.47	A	Night	

21	30.6.2020	3:00:13-3:59:13	47.68	A	Night	
22	30.6.2020	4:00:13-4:59:13	47.19	A	Night	
23	30.6.2020	5:00:13-5:59:13	47.49	A	Night	
24	30.6.2020	6:00:13-6:59:13	57.93	A	Night	
Average			**46.85**			

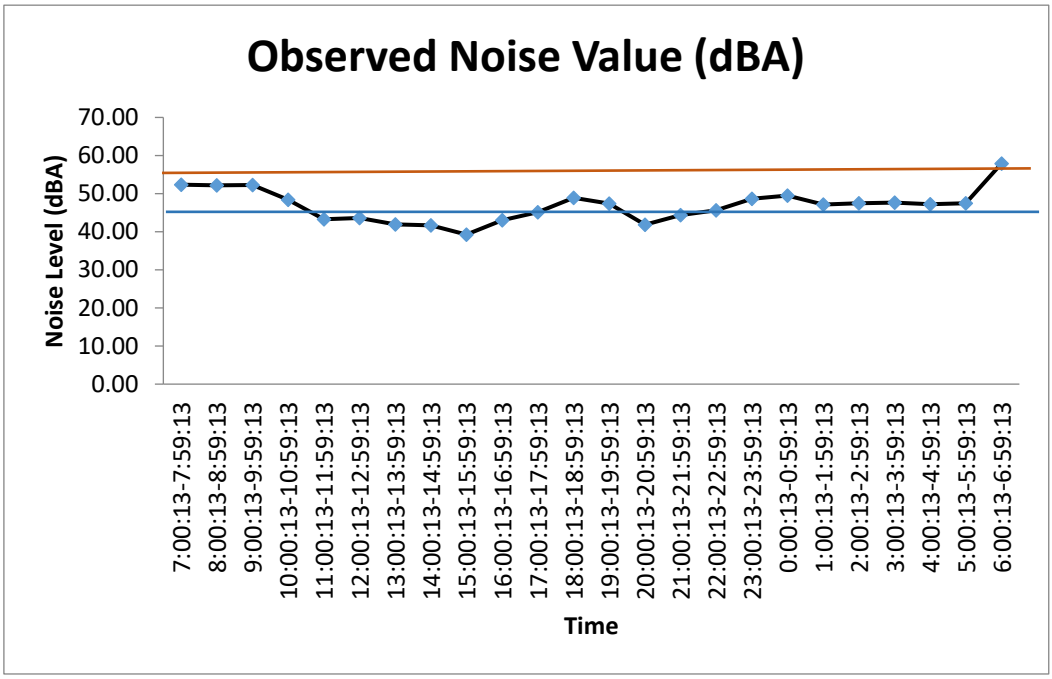

Figure 4. 18 Noise Level at Sa Ka Village

Table 4. 8 Observed Ambient Noise level Results from Myingyan Power Plant

Point	**Sembcorp Myingyan Power Plant**	
	Day Time	Night Time
Sembcorp Myingyan Power Plant	48.90	49.90
Guideline Values	70	70

Table 4. 9 Observed Ambient Noise level Results from Sa Ka Village

Point	**Sembcorp Myingyan Power Plant**	
	Day Time	Night Time
Sa Ka Village	45.71	48.74
Guideline Values	55	45

The observed values are compared with the National Environmental Quality (Emission) Guidelines as shown in **Table 4. 10** which indicates the separate level for residential and industrial points.

Table 4. 10 National Environmental Quality (Emission) Guidelines Values for Noise Level

Receptor	One Hour LAeq (dBA)	
	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

The observed values of the proposed project for daytime at Sembcorp myingyan power plant and Sa Ka village are 48.90 dB (A) and 45.71 dB (A). The observed values of the proposed project for night time at Sembcorp myingyan power plant and Sa Ka village are 49.90 dB (A) and 48.74 dB (A). The proposed project is located adjacent to the residential and commercial area. The observed values of daytime and nighttime at sembcorp myingyan power plant are under the National Environmental Quality (Emission) Guidelines. The observed values of daytime at Sa Ka Village is under the National Environmental Quality (Emission) Guidelines. The observed values of nighttime at Sa Ka village is upper the National Environmental Quality (Emission) Guidelines because this monitoring location is Sa Ka North Monastery. This monastery have near road. This road is passing through motor cycle and cars. So, the observed values of nighttime at Sa Ka village is upper the National Environmental Quality (Emission) Guidelines. But, Sa Ka village is acceptable Applicable Operational Noise Criteria of 54 dB (A) from ESIA Report.

APPENDIX A

Description of Haz-scanner (EPAS)

Publication 1801 Rev 1406

HAZ-SCANNER EPAS

Wireless Environmental Perimeter Air Station

HAZ-SCANNER EPAS shown with optional solar panels

Performance Profile

The HAZ-SCANNER EPAS is optimized for ambient air applications; custom calibration for specific ranges or applications is available upon request.

Display	LCD real time
Operation	4-key splash-proof membrane switch
Power	12-V Absorption Glass Mat (AGM) rechargable battery, 100-240 V AC, or optional solar panel
Display Measurements	Max, Min, TWA, STEL
Recording Time	1 sec to 21 weeks
Sampling Rate	1 sec, 1 min, 10 min, 1 hr, adjustable
Data Storage	450,560 data points
Sampling Pump	1.0 to 3.0 L/min
Digital Output	RS-232 (PC), RS-422 (Mac)
Software	PC or Mac
Dimensions (weather-proof case)	6 x 14 x 10 in (15.2 x 35.6 x 25.4 cm)
Weight	12 lbs (5.4 kg)
Operating Temperature	23 to 122 F (-5 to 50 C)
Storage Temperature	-40 to 140 F (-40 to 60 C)
Humidity	95% non-condensing (use inlet heater)
Wireless Radio Modem	900 MHz (U.S.), 868 MHz (Euro) up to 5 miles - line of sight (optional)
Auxiliary Analog Input	0 to 2.5 VDC (1 channel for alternative meter)

Configure an EPAS for Up to 14 Simultaneous Measurements

The standard HAZ-SCANNER EPAS includes the monitor (calibrated for ambient air applications) with sensors/meters for PM10 or TSP, VOCs, temperature, humidity, and wind speed/direction in a NEMA 4 enclosure, acid gas scrubber, internal battery, universal 110-240 V AC battery charger, software, cables, and CD with instructions.

Configure the monitor with additional sensors/meters — up to 4 optional interchangable sensors with upgradable software and/or up to 4 EPAS-specific meters (listed below). **See page 3 for specifications.** ***Specify sensors and meters when ordering.***

- PM1.0, 2.5, or 4.0
- Ammonia (EC)
- Carbon Dioxide (NDIR)
- Carbon Monoxide (EC)
- Chlorine (EC)
- Ethylene Oxide (EL)
- Hydrocarbon (methane-specific, EC)
- Hydrocarbons (EC)
- Hydrogen Chloride (EL)
- Hydrogen Cyanide (EC)
- Hydrogen Sulfide (EC)
- Nitric Oxide (EC)
- Nitrogen Dioxide
- Oxygen
- Ozone
- Phosphine (EL)
- Sulfur Dioxide
- Rain
- Solar Radiance
- Sound and Noise
- Atomic Radiation
- ELF Radiation
- Barometric Pressure
- Dew Point Temperature
- Wet Bulb Temperature

Contact SKC to build an EPAS with available sensors/meters/calibration for your application!

SKC Inc. 724-941-9701 SKC West 714-992-2780 SKC Gulf Coast 281-859-8050 SKC South 434-852-7149
www.skcinc.com

HAZ-SCANNER EPAS

Wireless Environmental Perimeter Air Station

HAZ-SCANNER EPAS Sensor/Meter Specifications

Parameter	Sensor*	Measurement/ Concentration Range	Accuracy	Minimum Resolution	Display Resolution	Additional Information
Particulates	90° infrared light scattering	0 to 5000 µg/m³	Greater of < ± 10% of reading or 0.2% full scale	10 µg/m³	1 µg/m³	Measures particle sizes 10 µm or TSP (standard) or 1, 2.5, or 4 µm (optional) in the 0.1 to 100 µm size range
VOCs	PID (10.6 eV)	0 to 50,000 ppb (0 to 50 ppm)	Greater of < ± 10% of reading or 2% full scale	5 ppb	1 ppb	Minimum detection level is 0.01 ppm. Standard sensor
Toxic Gas: NH_3 - Ammonia	Gas-sensing semiconductor (GSS) technology	0 to 100 ppm	Greater of < ± 10% of reading or 2% full scale	< 0.2 ppm	0.1 ppm	Optional sensor
Toxic Gas: CO_2 - Carbon Dioxide	NDIR	0 to 5000 ppm	Greater of < ± 10% of reading or 2% full scale	50 ppm	1 ppm	Optional sensor
Toxic Gas: CO - Carbon Monoxide	Electrochemical	0 to 10,000 ppb (0 to 10 ppm)	Greater of < ± 10% of reading or 2% full scale	20 ppb	1 ppb	Optional sensor
Toxic Gas: Cl_2 - Chlorine	Electrochemical	0 to 100 ppm	Greater of < ± 10% of reading or 2% full scale	< 0.2 ppm	0.1 ppm	Optional sensor
Toxic Gas: (C_2H_4O) - Ethylene Oxide	Electrochemical	0 to 1500 ppm	Greater of < ± 10% of reading or 2% full scale	8 ppm	1 ppm	Optional sensor
Toxic Gas: Hydrocarbon, CH_4 - Methane-specific	NDIR	0 to 1% Vol., 0 to 10,000 ppm, 0 to 20% LEL	Greater of < ± 10% of reading or 2% full scale	± 50 ppm or 0.1% LEL	50 ppm/ 0.1% LEL	Optional sensor
Toxic Gas: (Non-methane) Hydrocarbons (HC)	NDIR	Calibrated for 0 to 20% LEL of selected gas	Greater of < ± 10% of reading or 2% full scale	± 50 ppm/ 0.1% LEL	50 ppm/ 0.1% LEL	Optional sensor - specify gas type when ordering: ethane, propane, butane, hexane, ethanol, ethylene, or ethylene oxide
Toxic Gas: HCl - Hydrogen Chloride	Electrochemical	0 to 100 ppm	Greater of < ± 10% of reading or 2% full scale	< 0.2 ppm	0.1 ppm	Optional sensor
Toxic Gas: HCN - Hydrogen Cyanide	Electrochemical	0 to 100 ppm	Greater of < ± 10% of reading or 2% full scale	< 0.2 ppm	0.1 ppm	Optional sensor
Toxic Gas: H_2S - Hydrogen Sulfide	Electrochemical	0 to 25 ppm	Greater of < ± 10% of reading or 2% full scale	< 0.15 ppm	0.1 ppm	Optional sensor
Toxic Gas: NO - Nitric Oxide	Electrochemical	0 to 100 ppm	Greater of < ± 10% of reading or 2% full scale	< 0.2 ppm	0.1 ppm	Optional sensor
Toxic Gas: NO_2 - Nitrogen Dioxide	Electrochemical	0 to 5000 ppb (0 to 5 ppm)	Greater of < ± 10% of reading or 2% full scale	5 ppb	1 ppb	Optional sensor
Toxic Gas: O_2 - Oxygen	Electrochemical	0 to 30% Vol.	Greater of < ± 10% of reading or 2% full scale	0.6%	0.1%	Optional sensor
Toxic Gas: O_3 - Ozone	Gas-sensing semiconductor (GSS) technology	0 to 150 ppb (0 to 0.15 ppm), 0 to 500 ppb (0 to 0.5 ppm)	Greater of < ± 10% of reading or 2% full scale	1 ppb	1 ppb	Optional sensor
Toxic Gas: PH_3 - Phosphine	Electrochemical	0 to 100 ppm	Greater of < ± 10% of reading or 2% full scale	< 0.2 ppm	0.1 ppm	Optional sensor
Toxic Gas: SO_2 - Sulfur Dioxide	Electrochemical	0 to 5000 ppb (0 to 5 ppm) for ambient applications	Greater of < ± 10% of reading or 2% full scale	5 ppb	1 ppb	Optional sensor

* Not approved for intrinsically safe applications; do not use in explosive gas environments.

Specifications continued on next page

SKC Inc. 724-941-9701 SKC-West 714-992-2780 SKC Gulf Coast 281-859-8050 SKC South 434-852-7149
www.skcinc.com

HAZ-SCANNER EPAS

Wireless Environmental Perimeter Air Station

HAZ-SCANNER EPAS Sensor/Meter Specifications *(con't)*

Parameter	Sensor*	Measurement/ Concentration Range	Accuracy	Minimum Resolution	Display Resolution	Additional Information
Rain Fall/ Precipitation	Rain gauge (heated, tipping bucket)	0 to 5 inches daily	± 1% at 2 in/hr	0.01 in	0.01 in/tip	Optional meter
Temperature	NTC thermister	-4 to 140 F (-20 to 60 C)	Greater of ± 3% degree F or C of reading	1 degree F or C	1 degree F or C	Standard sensor
Relative Humidity (RH)	Thin-film capacitive	0 to 100% RH	± 2% RH	1% RH	1% RH	Standard sensor
Solar Radiance Intensity	Photodiode	1110 watts/ square meter (W/m²)	+ 5% of full scale (reference Eppley PSP at 1000 W/m²)	1 W/m²	1 W/m²	Optional meter
Sound and Noise	Type 2 SLM	30 to 130 decibels (dB)	± 1.5 dB	0.1 dB	1 dB	Optional meter
Atomic Radiation	Geiger counter	1 to 19,999 counts per minute (cpm) or 0.001 to 100 milliRad/hr	± 10% Typical, ± 15% Max.	1 cpm or .001 mR/hr	1 cpm or .001 mR/hr	Optional meter
ELF Radiation	Sensor with single-axis probe	1 to 200 gauss (G)	± 10% or 5% FS	1 G	1 G	Optional meter
Wind Speed/ Direction	3-cut anemometer/ continuous rotation potentiometric wind direction vane	0 to 125 mph/ 5 to 355°	± 1 mph or ± 3%/± 3°	1 mph/1°	1 mph/1°	Standard sensor
Barometric Pressure	Piezo resistive	28.25 to 30.75 in Hg	± 0.09 in Hg	0.01 in Hg	0.01 in Hg	Optional sensor
Dew Point Temperature	Software calculation from RH and temperature	8.2 to 122 F (-16 to 50 C)	± 3 F	1 F	1 F	Optional meter - software calculated
Wet Bulb Temperature	Capsulated thermistor with wick	8.2 to 122 F (-16 to 50 C)	± 3 F	1 F	1 F	Optional meter - one meter

* Not approved for intrinsically safe applications; do not use in explosive gas environments.

SKC Inc. 724-941-9701 SKC-West 714-992-2780 SKC Gulf Coast 281-859-8050 SKC South 434-852-7149
www.skcinc.com

Calibration Certificate for Haz-scanner

NANOVA CO., LTD.
Medical Scientific Industrial

Calibration Certificate

Customer	Eguard
System Model	EPAS
System Serial	915081
Calibration Date	2018 April 21

Sensor	Low	Actual	High	Actual
CO	0 ppm	0 ppm	10 ppm	8.2 ppm
CO2	0 ppm	0 ppm	300 ppm	250 ppm
SO2	0 ppm	0 ppm	2 ppm	1.5 ppm
NO2	0 ppm	0 ppm	3 ppm	2.1 ppm
PMA	0 ug/m3	0 ug/m3	23400 ug/m3	21100 ug/m3
PMB	0 ug/m3	0 ug/m3	21000 ug/m3	19100 ug/m3

Temperature **22 deg C**
Relative Humidity **32%**

Note
 # Perform by EDC technican's instruction.
 # This instrument is manufactured by Environmenatl Device Corporation (USA).

Environmental
Devices Corporation

Perform by

Nanda Maung	Technical Service Engineer	Nanova Co;ltd

Yangon Ofice
22A , Shan Yeik Thar Street , Sanchaung Township.
01-2304901 , 01-2304902
Help Line - 09977477774

APPENDIX B

Field Photos

Air Monitoring Point at Sa Ka Village (ASR4) Lat- 21°23’48.591”, Long- 95°23’0.849” 29.6.2020 to 30.6.2020	
Air Monitoring Point at Hnan Ywa Village (ASR3) Lat- 21°22’17.565”, Long- 95°23’18.116” 30.6.2020 to 01.7.2020	

Air Monitoring Point at Gyoke Pin Village (ASR5) Lat- 21°24’21.888”, Long- 95°21’07.381” 01.7.2020 to 02.7.2020	
Air Monitoring Point at Nyaung Kan Village (ASR14) Lat- 21°21’58.048”, Long- 95°20’51.346” 02.7.2020 to 03.7.2020	

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

motivate our planet

Report No. : GEM-LAB-201909020
Revision No. : 1
Report Date : 4 September, 2019
Application No. : 0299-C001

Analysis Report

Client Name : Sembcorp Myingyan Power Company Limited
Address : Beside of No.1 Steel Mill , Sa Khar Village, Myingyan.
Project Name : Sembcorp Myingyan Power Company Limited
Sample Description
Sample Name : Surface Water, August 2019
Sample No. : W-1908230
Waste Profile No. : -

Sampling Date : 20 August, 2019
Sampling By : Customer
Sample Received Date : 21 August, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	pH	APHA 4500 H+B (Electrometric Method)	_	8.09	0.0
2	Dissolved Oxygen (DO)	APHA 4500-O G (Membrane Electrode Method)	mg/l	5.67	0.00
3	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	14.00	_
4	BOD (5)	HACH Method 10099 (Respirometric Method)	mg/l	2.05	0.00
5	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	14.1	0.7
6	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	33	1.8
7	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	1.9	0.0
8	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	2.130	0.050
9	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
10	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
11	Zinc	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.956	0.005
12	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.01	0.01
13	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.004	0.002
14	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
15	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.002	0.002
16	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
17	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	2.258	0.005
18	Turbidity	APHA 2130 B (Nephelometric Method)	NTU	28.37	0.00
19	Conductivity	Instrument Analysis Method	mS/cm	0.914	0.000
20	Total Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	0.1	0.1

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
Sep 4, 2019
GEM

Approved By :

Tomoya Suzuki
Director
Sep 4, 2019

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

< Analysis Application Form >

Date: 21-8-19

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: Sembcorp Myingyan Power Company	Client name:
Address of client: Beside of No. 1 Steel Mill, Sa Khar Village, Myingyan	Address of client:
Project name: Sembcorp Myingyan Power Company Limited	Project name:
Tel No. / Email: Sample Collection by GEM	Tel No. / Email: ainsi@sembcorp.com;
Contact person/Position:	Contact person/Position:
Sample information: Sampling date: 20-08-19	Sample bottle(s): ☐Need to be returned, ■ Not need
Sampling by: SMPCL	Expected analysis report due date : 04-09-19
*To be filled by GEM Lab: Sampling Service; ■ No Use, ☐Use (Sampling date: Sampling by:)	

Sample details	No.	Example	1	2	3
	Sample name	WW-1	Surface Water, August 2019		
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			
	Q'ty of container	Total 2 bottles			
Analysis parameter				☐	☐
	pH	■	■	☐	☐
	Total Suspended Solid (SS)	☐	■	☐	☐
	BOD_5	■	■	☐	☐
	COD_{Cr}	■	■	☐	☐
	Oil and Grease	■	■	☐	☐
	Total Nitrogen (T-N)	☐	■	☐	☐
	Total Phosphorous (T-P)	☐	■	☐	☐
	Total Chlorine	☐	■	☐	☐
	Zinc	☐	■	☐	☐
	Chromium (Total)	☐	■	☐	☐
	Arsenic	☐	■	☐	☐
	Copper	☐	■	☐	☐
	Mercury	☐	■	☐	☐
	Cadmium	☐	■	☐	☐
	Lead	☐	■	☐	☐
	Iron	☐	■	☐	☐
	Total Coliform	☐	■	☐	☐
	Conductivity	☐	■	☐	☐
	Turbidity	☐	■	☐	☐
	Dissolved Oxygen (DO)	☐	■	☐	☐
				☐	☐
				☐	☐
				☐	☐
				☐	☐
				☐	☐
				☐	☐
				☐	☐
				☐	☐
				☐	☐
				☐	☐
				☐	☐
				☐	☐
				☐	☐
		☐	☐	☐	☐
		☐	☐	☐	☐
		☐	☐	☐	☐
		☐	☐ 20	☐	☐
	Other request (if any)	-Nitrate, -Fluoride			
		-Total Alkalinity			
*To be filled by GEM Lab	Sample No.	*******	W-190820		

LAB GEM

Remark(if any): 09020

Zaw Moe Aung

*To be filled by GEM lab		
Application Received by:	Sample Received by:	Application No: (*our administration section)
Date: 21.8.19	Date: 21.8.19	0299-C001

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-201911181
Revision No. : 1
Report Date : 29 November, 2019
Application No. : 0299-C001

Analysis Report

Client Name : Sembcorp Myingyan Power Company Limited
Address : Beside of No.1 Steel Mill , Sa Khar Village, Myingyan.
Project Name : Sembcorp Myingyan Power Company Limited
Sample Description
Sample Name : Surface Water, November 2019
Sample No. : W-1911162
Waste Profile No. : -
Sampling Date : 18 November, 2019
Sampling By : Customer
Sample Received Date : 19 November, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	pH	APHA 4500 H+B (Electrometric Method)	-	7.91	0.0
2	Dissolved Oxygen (DO)	APHA 4500-O G (Membrane Electrode Method)	mg/l	4.21	0.00
3	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	12.00	-
4	BOD (5)	HACH Method 10099 (Respirometric Method)	mg/l	7.18	0.00
5	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	13.1	0.7
6	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	79	1.8
7	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	3.0	0.0
8	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.819	0.050
9	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
10	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
11	Zinc	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.354	0.005
12	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.01	0.01
13	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.004	0.002
14	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
15	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.006	0.002
16	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
17	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	2.060	0.005
18	Turbidity	APHA 2130 B (Nephelometric Method)	NTU	26.78	0.00
19	Conductivity	Instrument Analysis Method	mS/cm	0.749	0.000
20	Total Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	0.1	0.1

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

LAB
Nov 29, 2019
GEM

Analysed By :
Ni Ni Aye Lwin
Assistant Manager

Approved By :
Tomoya Suzuki
Director
Nov 29, 2019

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

< Analysis Application Form >

Date: 19-11-19

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: Sembcorp Myingyan Power Company	Client name:
Address of client: Beside of No. 1 Steel Mill, Sa Khar Village, Myingyan	Address of client:
Project name: Sembcorp Myingyan Power Company Limited	Project name:
Tel No. / Email:	Tel No. / Email: ainsi@sembcorp.com;
Contact person/Position:	Contact person/Position:

Sample information	Sampling date:	Sample bottle(s): ☐Need to be returned, ■ Not need
	Sampling by: SMPCL	Expected analysis report due date : 04-11-19
*To be filled by GEM Lab	Sampling Service; ■ No Use, ☐Use (Sampling date:	Sampling by:)

Sample details	No.	Example	1	2	3
	Sample name	WW-1	Surface Water, November 2019		
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			
	Q'ty of container	Total 2 bottles			

Analysis parameter					
				☐	☐
	pH	■	■ ✓	☐	☐
	Total Suspended Solid (SS)	☐	■ ✓	☐	☐
	BOD_5	■	■ ✓	☐	☐
	COD_{Cr}	■	■ ✓	☐	☐
	Oil and Grease	■	■ ✓	☐	☐
	Total Nitrogen (T-N)	☐	■ ✓	☐	☐
	Total Phosphorous (T-P)	☐	■ ✓	☐	☐
	Total Chlorine	☐	■ ✓	☐	☐
	Zinc	☐	■ ✓	☐	☐
	Chromium (Total)	☐	■ ✓	☐	☐
	Arsenic	☐	■ ✓	☐	☐
	Copper	☐	■ ✓	☐	☐
	Mercury	☐	■ ✓	☐	☐
	Cadmium	☐	■ ✓	☐	☐
	Lead	☐	■ ✓	☐	☐
	Iron	☐	■ ✓	☐	☐
	Total Coliform	☐	■ ✓	☐	☐
	Conductivity	☐	■ ✓	☐	☐
	Turbidity	☐	■ ✓	☐	☐
	Dissolved Oxygen (DO)	☐	■ ✓	☐	☐
				☐	☐
				☐	☐
				☐	☐
				☐	☐
				☐	☐
				☐	☐
				☐	☐
				☐	☐
				☐	☐
				☐	☐
				☐	☐
				☐	☐
				☐	☐
				☐	☐
				☐	☐
				☐	☐
				☐	☐
		☐	☐	☐	☐
		☐	☐	☐	☐
		☐	☐ ✓	☐	☐
		☐	☐	☐	☐
	Other request (if any)	-Nitrate, -Fluoride			
		-Total Alkalinity			
*To be filled by GEM Lab	Sample No.	*******	W.191162		

LAB GEM

Remark(if any):

11181

Zaw Moe Aung

*To be filled by GEM lab		
Application Received by:	Sample Received by:	Application No: (*our administration section)
Date: 19.11.19	Date: 19.11.19	0299 - 6001

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-202002067
Revision No. : 1
Report Date : 14 February, 2020
Application No. : 0299-C001

Analysis Report

Client Name : Sembcorp Myingyan Power Company Limited
Address : Beside of No.1 Steel Mill , Sa Khar Village, Myingyan.
Project Name : Sembcorp Myingyan Power Company Limited
Sample Description
Sample Name : Discharged pipe line sampling point *1
Sample No. : W-2001170
Waste Profile No. : -
Sampling Date : 28 January, 2020
Sampling By : Customer
Sample Received Date : 29 January, 2020

No.	Parameter	Method	Unit	Result	LOQ
1	pH	APHA 4500 H+B (Electrometric Method)	-	7.67	0.0
2	Dissolved Oxygen (DO)	APHA 4500-O G (Membrane Electrode Method)	mg/l	3.45	0.00
3	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	10	-
4	BOD (5)	HACH Method 10099 (Respirometric Method)	mg/l	5.93	0.00
5	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	17.6	0.7
6	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	130	1.8
7	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	1.6	0.5
8	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.67	0.05
9	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
10	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
11	Zinc	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.344	0.005
12	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.01	0.01
13	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
14	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
15	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
16	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
17	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	1.706	0.005
18	Turbidity	APHA 2130 B (Nephelometric Method)	NTU	9.50	0.00
19	Conductivity	Instrument Analysis Method	mS/cm	0.977	0.000
20	Total Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	0.1	0.1

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

*1) Sample Temperature was 22.6'C at the sampling site that information was provided by customer.

Analysed By :

Ni Ni Aye Lwin
Assistant Manager

LAB
Feb 14, 2020
GEM

Approved By :

Yoshiyuki Narabe
Manager
Feb 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

motivate our planet

Report No. : GEM-LAB-202002068
Revision No. : 1
Report Date : 14 February, 2020
Application No. : 0299-C001

Analysis Report

Client Name : Sembcorp Myingyan Power Company Limited
Address : Beside of No.1 Steel Mill , Sa Khar Village, Myingyan.
Project Name : Sembcorp Myingyan Power Company Limited
Sample Description
Sample Name : Upstream 100m *1
Sample No. : W-2001171
Waste Profile No. : -
Sampling Date : 28 January, 2020
Sampling By : Customer
Sample Received Date : 29 January, 2020

No.	Parameter	Method	Unit	Result	LOQ
1	Temperature	Instrument Analysis Method	°C	21.6	0.0
2	pH	APHA 4500 H+ B (Electrometric Method)	–	7.84	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	5.2	0.7
4	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	1.138	0.002
5	Turbidity	APHA 2130 B (Nephelometric Method)	NTU	19.63	0.00
6	Conductivity	Instrument Analysis Method	mS/cm	0.175	0.000
7	Total Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	0.1	0.1
8	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	0.6	0.5
9	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.05	0.05

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
*1) Sample Temperature was 21.7'C at the sampling site that information was provided by customer.

Analysed By :

Ni Ni Aye Lwin
Assistant Manager

LAB
Feb 14, 2020
GEM

Approved By :

Yoshiyuki Narabe Feb 14, 2020
Manager

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

Report No. : GEM-LAB-202002069
Revision No. : 1
Report Date : 14 February, 2020
Application No. : 0299-C001

Analysis Report

Client Name : Sembcorp Myingyan Power Company Limited
Address : Beside of No.1 Steel Mill , Sa Khar Village, Myingyan.
Project Name : Sembcorp Myingyan Power Company Limited
Sample Description
Sample Name : Upstream mid river *1
Sample No. : W-2001172
Waste Profile No. : -
Sampling Date : 28 January, 2020
Sampling By : Customer
Sample Received Date : 29 January, 2020

No.	Parameter	Method	Unit	Result	LOQ
1	Temperature	Instrument Analysis Method	°C	21.0	0.0
2	pH	APHA 4500 H+ B (Electrometric Method)	_	7.85	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	5.8	0.7
4	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	1.048	0.002
5	Turbidity	APHA 2130 B (Nephelometric Method)	NTU	22.08	0.00
6	Conductivity	Instrument Analysis Method	mS/cm	0.178	0.000
7	Total Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	< 0.1	0.1
8	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	0.5	0.5
9	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.06	0.05

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
*1) Sample Temperature was 21.7'C at the sampling site that information was provided by customer.

Analysed By :

Ni Ni Aye Lwin
Assistant Manager

LAB
Feb 14, 2020
GEM

Approved By :

Yoshiyuki Narabe
Manager
Feb 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

motivate our planet

Report No. : GEM-LAB-202002070
Revision No. : 1
Report Date : 14 February, 2020
Application No. : 0299-C001

Analysis Report

Client Name : Sembcorp Myingyan Power Company Limited
Address : Beside of No.1 Steel Mill , Sa Khar Village, Myingyan.
Project Name : Sembcorp Myingyan Power Company Limited
Sample Description
Sample Name : Downstream 100m *1
Sample No. : W-2001173
Waste Profile No. : -
Sampling Date : 28 January, 2020
Sampling By : Customer
Sample Received Date : 29 January, 2020

No.	Parameter	Method	Unit	Result	LOQ
1	Temperature	Instrument Analysis Method	°C	21.0	0.0
2	pH	APHA 4500 H+ B (Electrometric Method)	–	7.81	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	10.4	0.7
4	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.854	0.002
5	Turbidity	APHA 2130 B (Nephelometric Method)	NTU	16.90	0.00
6	Conductivity	Instrument Analysis Method	mS/cm	0.183	0.000
7	Total Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	0.1	0.1
8	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	< 0.5	0.5
9	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	< 0.05	0.05

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
*1) Sample Temperature was 21.7'C at the sampling site that information was provided by customer.

Analysed By :

Ni Ni Aye Lwin
Assistant Manager

LAB
Feb 14, 2020
GEM

Approved By :

Yoshiyuki Narabe Feb 14, 2020
Manager

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-202007062
Revision No. : 1
Report Date : 8 July, 2020
Application No. : 0299-C001

Analysis Report

Client Name : Sembcorp Myingyan Power Company Limited
Address : Beside of No.1 Steel Mill , Sa Khar Village, Myingyan.
Project Name : Sembcorp Myingyan Power Company Limited
Sample Description
Sample Name : Discharged pipe line sampling point
Sample No. : W-2006180
Waste Profile No. : -
Sampling Date : 16 June, 2020
Sampling By : GEM
Sample Received Date : 16 June, 2020

No.	Parameter	Method	Unit	Result	LOQ
1	Temperature	Instrument Analysis Method	°C	29.3	0.0
2	pH	APHA 4500 H+ B (Electrometric Method)	-	8.04	0.00
3	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	24	-
4	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
5	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
6	Zinc	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.452	0.002
7	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.01	0.01
8	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
9	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
10	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
11	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
12	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	2.114	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
July 8, 2020
GEM

Approved By :

Hideki Yamo
Managing Director
July 8, 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

motivate our planet

Report No. : GEM-LAB-202007063
Revision No. : 1
Report Date : 8 July, 2020
Application No. : 0299-C001

Analysis Report

Client Name : Sembcorp Myingyan Power Company Limited
Address : Beside of No.1 Steel Mill , Sa Khar Village, Myingyan.
Project Name : Sembcorp Myingyan Power Company Limited
Sample Description
Sample Name : Upstream 100m
Sample No. : W-2006181
Waste Profile No. : -

Sampling Date : 16 June, 2020
Sampling By : GEM
Sample Received Date : 16 June, 2020

No.	Parameter	Method	Unit	Result	LOQ
1	Temperature	Instrument Analysis Method	°C	28.9	0.0
2	pH	APHA 4500 H+ B (Electrometric Method)	_	7.77	0.00
3	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	104	_
4	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
5	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
6	Zinc	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.034	0.002
7	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.01	0.01
8	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
9	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
10	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
11	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
12	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	4.114	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
July 8, 2020
GEM

Approved By :

Hideki Yorno July 8, 2020
Managing Director

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-202007064
Revision No. : 1
Report Date : 8 July, 2020
Application No. : 0299-C001

Analysis Report

Client Name : Sembcorp Myingyan Power Company Limited
Address : Beside of No.1 Steel Mill , Sa Khar Village, Myingyan.
Project Name : Sembcorp Myingyan Power Company Limited
Sample Description

Sample Name : Upstream mid river
Sample No. : W-2006182
Waste Profile No. : -

Sampling Date : 16 June, 2020
Sampling By : GEM
Sample Received Date : 16 June, 2020

No.	Parameter	Method	Unit	Result	LOQ
1	Temperature	Instrument Analysis Method	°C	29.2	0.0
2	pH	APHA 4500 H+ B (Electrometric Method)	_	7.84	0.00
3	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	92	_
4	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
5	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
6	Zinc	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.032	0.002
7	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.01	0.01
8	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
9	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
10	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
11	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
12	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	3.866	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 July 8, 2020 GEM

Approved By :

Hideki Yomo July 8, 2020
Managing Director

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-202007065
Revision No. : 1
Report Date : 8 July, 2020
Application No. : 0299-C001

Analysis Report

Client Name : Sembcorp Myingyan Power Company Limited
Address : Beside of No.1 Steel Mill , Sa Khar Village, Myingyan.
Project Name : Sembcorp Myingyan Power Company Limited
Sample Description

Sample Name : Downstream 100m
Sample No. : W-2006183
Waste Profile No. : -

Sampling Date : 16 June, 2020
Sampling By : GEM
Sample Received Date : 16 June, 2020

No.	Parameter	Method	Unit	Result	LOQ
1	Temperature	Instrument Analysis Method	°C	28.4	0.0
2	pH	APHA 4500 H+ B (Electrometric Method)	_	7.65	0.00
3	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	82	_
4	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
5	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
6	Zinc	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.028	0.002
7	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.01	0.01
8	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
9	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
10	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
11	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
12	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	1.786	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
July 8 2020
GEM

Approved By :

Hideki Yomo
July 8 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: 16-6-20

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: Sembcorp Myingyan Power Company	Client name:
Address of client: Beside of No. 1 Steel Mill, Sa Khar Village, Myingyan	Address of client:
Project name: PO No. 4090000918	Project name:
Tel No. / Email:	Tel No. / Email: ainsi@sembcorp.com;
Contact person/Position:	Contact person/Position:

Sample information	Sampling date:	Sample bottle(s): ☐Need to be returned, ■ Not need
	Sampling by:	Expected analysis report due date :
*To be filled by GEM Lab	Sampling Service; ☐ No Use, ■Use (Sampling date: 16-6-20	Sampling by: GEM)

Sample details		No.	1	2	3	4
		Sample name	Discharged pipe line sampling point	Upstream 100m	Upstream mid river	Downstream 100m
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					
	Q'ty of container					
Analysis parameter	Temperature		■	■	■	■
	pH		■	■	■	■
	SS		■	■	■	■
	Oil and Grease		■	■	■	■
	Mercury		■	■	■	■
	Zinc		■	■	■	■
	Arsenic		■	■	■	■
	Chromium		■	■	■	■
	Cadmium		■	■	■	■
	Copper		■	■	■	■
	Lead		■	■	■	■
	Iron		■	■	■	■
			☐	☐	☐	☐
			☐	☐	☐	☐
			☐	☐	☐	☐
			☐	☐	☐	☐
			☐	☐	☐	☐
			☐	☐	☐	☐
			☐	☐	☐	☐
			☐	☐	☐	☐
			☐	☐	☐	☐
			☐	☐	☐	☐
	Other request (if any)		-Nitrate, -Fluoride -Total Alkalinity 12	12	12	12
*To be filled by GEM Lab	Sample No.		******* W-2006180	W-2006181	W-2006182	W-2006183

Remark(if any): 07062 07063 07064 07065

LAB GEM

Zaw Moe Aung

*To be filled by GEM lab Application Received by: [signature]	Sample Received by: [signature]	Application No: (*our administration section)
Date: 16/7/20	Date: 16/7/20	~~4-3-2~~ 0299 - C 0 0 1