MJTD

Thilawa Special Economic Zone (Zone B) Development

Environmental Monitoring Report Phase-1 (Construction Phase)

Myanmar Japan Thilawa Development Limited.

September 2017

CONTENTS

Appendix

1. Executive Summary

The environmental inspection and compliance monitoring program will be implemented under the direction of Ministry of Natural Resources and Environmental Conservation (MONREC) with oversight by Thilawa SEZ Management Committee.

The monitoring record from June 2017 to August 2017 according to the Environment Monitoring Plan is submitted in conformity with the provision of Chapter 10, 10.1 Table 10.1-2 and 10.2, Table 10.2-2 Content of the EIA Report of Thilawa SEZ Development Project (Zone B).

2. Summary of Monitoring Activities

a) **Progress made to date on the implementation of the EMP against the submitted implementation schedule;**

We already summit EMP for Pre-Construction Phase Report (March 2017) and Phase-1 Construction Phase Report (No.1, June 2017) and Report (No.2, September 2017) is submitted this day attached with Construction Phase implementation schedule.

b) **Difficulties encountered in implementing of the EMP and recommendations for remedying those difficulties and steps proposed to prevent or avoid similar future difficulties;**

None

c) **Number and type of non-compliance with the EMP and proposed remedial measures and timelines for completion of remediation;**

None

d) **Accidents or incidents relating to the occupational and community health and safety, and the environment;**

Neither accidents nor incidents happen during this monitoring period.

e) **Monitoring data on environmental parameters and conditions as committed in the EMP or otherwise required.**

Please refer to the attached Environmental Monitoring Form.

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED MJTD

3. Construction Progress

Thilawa SEZ Zone B Development Project construction activities is submitted enclosed with monthly progress reports from contractor in Appendix A to D.

A. Monthly Progress Report for June, 2017

B. Monthly Progress Report for July, 2017

C. Monthly Progress Report for August, 2017

4. Monitoring Result

Environmental Monitoring plan report for Construction Phase implemented according to the following table, reference on Table 10.2-2, Chapter 10, EIA for Industrial Area of Zone-B.

Monitoring Plan (Construction Phase)

Category	Item	Location	Frequency	Remark
Air Quality	NO_2, SO_2, CO, $PM_{2.5}$, PM_{10}	Construction site (1 point)	Once/ 3month	July 2017, Monitoring Report
Water Quality	Water temperature, pH, SS, DO, BOD_5, COD, coliforms, oil and grease, chromium	- Over flow of construction site to the creek (at least 3 sampling points/ mixing point: i) discharge water, ii) upstream water and iii) downstream water - Well near the construction site (1 point)	Once/ 2 month	June 2017 Monitoring Report
Waste	Amount and kind of solid waste	Construction site	Once/ 3 month	Monthly Progress Reports (June, July and August) 2017
Noise and Vibration	- Noise and vibration level - Traffic Count	Preservation area such as residence around the proposed construction site (at least 1 point)	Once/ 3 month (peak period)	Noise and Vibration Monitoring Report June 2017
		Preservation site such as residence along the route for on-site vehicles (1 point for noise and vibration and 2 points for traffic count)		Traffic Count Monitoring Report June 2017
Ground Subsidence	- Ground water level - Ground elevation level - Consumption of ground water amount	Representative (1 point)	Every week	Monthly Progress Reports (June, July and August) 2017
Hydrology				
Risk for infectious disease such as AIDS/HIV	Status of measures of infectious disease	Construction site	Once/month	Monthly Progress Reports (June, July and August) 2017
Working conditions (including occupational safety)	Prehension of condition of occupational safety and health Prehension of infectious disease	Construction site	Once/ month	
Accident	Existence of accident	Construction site	As occasion arise	

Thilawa Special Economic Zone (Zone B)
Development Project –Phase 1

Environment Monitoring Form

Environment Monitoring Form

The latest results of the below monitoring items shall be submitted to Authorities on once at Pre-Construction Phase and on quarterly basis at Construction Phase, and on bi-annually base at Operation Phase. The items, standards to be applied, measurement points, and frequency for each monitoring parameter are established based on the EIA Report for Thilawa Special Economic Zone Development Project (Industrial Area of Zone B). Should there be any changes to the original plan, such change shall be reviewed and evaluated by environmental expert.

(1) General

1) Phase of the Project

- Please mark the current phase.

☐ Pre-Construction Phase ☑ Construction Phase ☐ Operation Phase

2) Obtainment of Environmental Permits

Name of permits	Expected issuance date	Actual issuance date	Concerned authority	Remarks (Conditions, etc.)
Approved letter for Environmental Impact Assessment (EIA) Report of Industrial Area, Thilawa Special Economic Zone (Zone-B)		29th December 2016	Thilawa SEZ Management Committee	

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED MJTD

3) Response/Actions to Comments and Guidance from Government Authorities and the Public

Monitoring Item	Monitoring Results during Report Period	Duration of Report Period	Frequency
Number and contents of formal comments made by the public			Upon receipt of comments/ complaints
Number and contents of responses from Government agencies			

(2) Monitoring Results

1) Ambient Air Quality (July 2017)

NO_2, SO_2, CO, $PM_{2.5}$, PM_{10}

Location	Item	Unit	Measured Value (Mean)	Measured Value (Max)	Country's Standard	Target value to be applied*	Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
AQ-1	NO_2	mg/m³	0.065	0.119	0.2 mg/m³ (1 Hour)	0.2 mg/m³ (1 Hour)	-	One time / 3 months		
	SO_2	mg/m³	0.017	0.036	0.02 mg/m³ (24 Hours)	0.02 mg/m³ (24 Hours)	-			
	CO	mg/m³	0.03	0.156	-	10.26 mg/m³ (24 Hours)	-			
	$PM_{2.5}$	mg/m³	0.011	0.169	0.025 mg/m³ (24 Hours)	0.025 mg/m³ (24 Hours)	-			
	PM_{10}	mg/m³	0.015	0.152	0.05 mg/m³ (24 Hours)	0.05 mg/m³ (24 Hours)	-			

*Remarks: Referred to the tentative target value of ambient air quality (EIA Report for industrial area, Table 2.4-1), Reference to the air quality monitoring report (July 2017)

Complaints from Residents

- Are there any complaints from residents regarding air quality in this monitoring period? ☐ Yes ☑ No
If yes, please describe the contents of complains and its countermeasures to fill in below the table.

Contents of Complaints from Residents	Countermeasures

2) Water Quality – June 2017

Measurement Point: Effluent of Wastewater (SW-2, SW-3 and SW-4 are attach as reference point only and they are natural creek water which are combine all the wastewater from the Local industrial water and domestic water from existing living environment. SW-7 is the main discharging point and SW-8 is mixing point of discharge water but in this monitoring time SW-7 and SW-8 location are almost same location. GW-2 is also as reference point for monitoring of existing tube well located in the Monastery Compound near Zone-B area)

- Are there any effluents to water body in this monitoring period? ☐ Yes, ☑ No
If yes, please attach "Analysis Record" and fill in the items not to comply with Refereed International Standard

Location	Item	Unit	Measured Value (Max)	Country's Standard*2	Target value to be applied*1	Frequency	Method	Note (Reason of excess of the standard)
SW-2 (reference point)	Temperature	°C	26.8	< 3 (increase)	40	Once per 2 months	Instrument Analysis Method	
	pH	-	7.3	6-9	6.0 – 9.0		Instrument Analysis Method	
	SS*3	mg/L	38	50	30		APHA 2540D (Dry at 103-105°C Method)	
	DO	mg/L	4.43	-	-		Instrument Analysis Method	
	BOD_5	mg/L	1.71	50	20		APHA 5210 B (5days BOD Test)	
	COD_{Cr}	mg/L	21.5	250	70		APHA 5220 D (Close Reflux Colorimetric Method)	
	Total Coliform*4	MPN/100ml	92,000	400	400		APHA 9221 B (Standard Total Coliform Fermentation Technique)	
	Oil and Grease	mg/L	4.73	10	10		APHA 5520 B (partition Gravimetric Method)	
	Chromium	mg/L	≤ 0.002	0.5	0.5		APHA (Inductively Coupled Plasma (ICP) Method)	

SW-3 (reference point)	Temperature	°C	27.9	< 3 (increase)	40	Once per 2 months	Instrument Analysis Method	
	pH	-	6.9	6-9	6.0 – 9.0		Instrument Analysis Method	
	SS*3	mg/L	70	50	30		APHA 2540D (Dry at 103-105°C Method)	
	DO	mg/L	3.38	-	-		Instrument Analysis Method	
	BOD_5	mg/L	0.00	50	20		APHA 5210 B (5days BOD Test)	
	COD_{Cr}	mg/L	11.3	250	70		APHA 5220 D (Close Reflux Colorimetric Method)	
	Total Coliform*4	MPN/100ml	35,000	400	400		APHA 9221 B (Standard Total Coliform Fermentation Technique)	
	Oil and Grease	mg/L	< 3.1	10	10		APHA 5520 B (partition Gravimetric Method)	
	Chromium	mg/L	≤ 0.002	0.5	0.5		APHA (Inductively Coupled Plasma (ICP) Method)	
SW-4 (reference point)	Temperature	°C	28.2	< 3 (increase)	40	Once per 2 months	Instrument Analysis Method	
	pH	-	7.1	6-9	6.0 – 9.0		Instrument Analysis Method	
	SS*3	mg/L	82	50	30		APHA 2540D (Dry at 103-105°C Method)	
	DO	mg/L	6.86	-	-		Instrument Analysis Method	
	BOD_5	mg/L	2.99	50	20		APHA 5210 B (5days BOD Test)	
	COD_{Cr}	mg/L	11.6	250	70		APHA 5220 D (Close Reflux Colorimetric Method)	
	Total Coliform*4	MPN/100ml	54,000	400	400		APHA 9221 B (Standard Total Coliform Fermentation Technique)	
	Oil and Grease	mg/L	< 3.1	10	10		APHA 5520 B (partition Gravimetric Method)	
	Chromium	mg/L	≤ 0.002	0.5	0.5		APHA (Inductively Coupled Plasma (ICP) Method)	
SW-7	Temperature	°C	28.3	< 3 (increase)	40	Once per 2 months	Instrument Analysis Method	
	pH	-	7.3	6-9	6.0 – 9.0		Instrument Analysis Method	
	SS*3	mg/L	36	50	30		APHA 2540D (Dry at 103-105°C Method)	
	DO	mg/L	4.79	-	-		Instrument Analysis Method	
	BOD_5	mg/L	0.00	50	20		APHA 5210 B (5days BOD Test)	
	COD_{Cr}	mg/L	21	250	70		APHA 5220 D (Close Reflux Colorimetric Method)	

	Total Coliform*4	MPN/100ml	> 160,000	400	400		APHA 9221 B (Standard Total Coliform Fermentation Technique)	
	Oil and Grease	mg/L	4.18	10	10		APHA 5520 B (partition Gravimetric Method)	
	Chromium	mg/L	≤ 0.002	0.5	0.5		APHA (Inductively Coupled Plasma (ICP) Method)	
SW-8	Temperature	°C	28.3	< 3 (increase)	40	Once per 2 months	Instrument Analysis Method	
	pH	-	7.3	6-9	6.0 – 9.0		Instrument Analysis Method	
	SS*3	mg/L	36	50	30		APHA 2540D (Dry at 103-105°C Method)	
	DO	mg/L	4.79	-	-		Instrument Analysis Method	
	BOD_5	mg/L	0.00	50	20		APHA 5210 B (5days BOD Test)	
	COD_{Cr}	mg/L	21	250	70		APHA 5220 D (Close Reflux Colorimetric Method)	
	Total Coliform*4	MPN/100ml	> 160,000	400	400		APHA 9221 B (Standard Total Coliform Fermentation Technique)	
	Oil and Grease	mg/L	4.18	10	10		APHA 5520 B (partition Gravimetric Method)	
	Chromium	mg/L	≤ 0.002	0.5	0.5		APHA (Inductively Coupled Plasma (ICP) Method)	
GW-2 (reference point)	Temperature	°C	28	< 3 (increase)	40	Once per 2 months	Instrument Analysis Method	
	pH	-	7	6-9	6.0 – 9.0		Instrument Analysis Method	
	SS	mg/L	6	50	30		APHA 2540D (Dry at 103-105°C Method)	
	DO	mg/L	7.71	-	-		Instrument Analysis Method	
	BOD_5	mg/L	2.41	50	20		APHA 5210 B (5days BOD Test)	
	COD_{Cr}	mg/L	< 0.7	250	70		APHA 5220 D (Close Reflux Colorimetric Method)	
	Total Coliform	MPN/100ml	23	400	400		APHA 9221 B (Standard Total Coliform Fermentation Technique)	
	Oil and Grease	mg/L	< 3.1	10	10		APHA 5520 B (partition Gravimetric Method)	
	Chromium	mg/L	≤ 0.002	0.5	0.5		APHA (Inductively Coupled Plasma (ICP) Method)	

*1Remark: Reference to the Water and Wastewater Quality Monitoring Report (April 2017)

*2Remark: Referred to the National Emission Quality Guideline (NEQG) 29th December 2015

*3Remark: For the reference monitoring point of SW-2, SW-3, SW-4, SW-7 and SW-8 the result of SS is excess than the target value due to the three expected reasons; i) surface

water run-off from bare land in Zone-B, ii) delivered from upstream area such as natural origin and wastewater from local industrial zone outside of Thilawa SEZ and iii) influence by water from the local industrial zone outside of Thilawa SEZ.

*4Remark: For the reference monitoring point of SW-2, SW-3, SW-4, SW-7 and SW-8 the result of Total coliform is excess than the target value due to two expected reasons i) natural bacteria existed in discharged creek because there are various kinds of vegetation and creature such as birds, and small animals in and along the discharged creek and ii) wastewater from the local industrial zone outside of Thilawa SEZ.

3) Soil Contamination (only operation phase)

Situations environmental report from tenants

- **Are there any serious issues regarding soil contamination in this monitoring period?** ☐ Yes, ☑ No

If yes please describe the contents of complains and its countermeasures to fill in below the table.

Contents of Issues on Soil Contamination	Countermeasures

4) Noise Level (June 2017)

Location	Item	Unit	Measured Value (Mean)	Measured Value (Max)	Country's Standard	Target value to be applied	Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
Residential Area NV-2	Leq (day)	dB(A)	53	61	Refer to NEQG Article 1.3	75	Refer the section 2.4 in EIA main report	One time / 3 months		
	Leq (evening)	dB(A)	65	66		60				
	Leq(night)	dB(A)	52	60		55				
Along the road (NV-1)	Leq (day)	dB(A)	62	66		75				
	Leq(night)	dB(A)	53	56		70				

***Remarks:** Referred to the tentative target value of ambient air quality (EIA Report for industrial area, Table 2.4-8), Reference to the noise and vibration monitoring report (June 2017)

Complaints from Residents

- Are there any complaints from residents regarding noise in this monitoring period? ☐ Yes, ☑ No
  If yes, please describe the contents of complains and its countermeasures to fill in below the table.

Contents of Complaints from Residents	Countermeasures

5) Solid Waste

Measurement Point: Construction Site (Construction Phase), Storage for Sludge (Operation Phase)

- Are there any wastes if sludge in this monitoring period? ☐ Yes, ☑ No

If yes, please report the amount of sludge and fill in the results of solid waste management activities.

Item	Date	Generated from	Unit	Value	Solid Waste Management Activities
Amount of sludge	29-Jul-2017	Construction Waste	Loads	2	Waste disposing to authorized waste collector (YCDC)
Amount of sludge	3-Aug-2017	Construction Waste	Loads	1	Waste disposing to authorized waste collector (YCDC)

6) (a)Ground Subsidence Hydrology

Duration (Week)	Water Consumption		Ground Level		Note
	Quantity	Unit	Quantity	Unit	
1-Jun-2017	36	m^3/ week	6.299	m	
8-Jun-2017	37	m^3/ week	6.300	m	
15-Jun-2017	48	m^3/ week	6.300	m	
22-Jun-2017	46	m^3/ week	6.299	m	
29-Jun-2017	62	m^3/ week	6.298	m	

Remarks: Reference to Monthly Progress Report (June-2017)

6) (b)Ground Subsidence Hydrology

Duration (Week)	Water Consumption		Ground Level		Note
	Quantity	Unit	Quantity	Unit	
6-Jul-2017	74	m^3/ week	6.298	m	
13-Jul-2017	75.34	m^3/ week	6.299	m	
20-Jul-2017	102.33	m^3/ week	6.300	m	
27-Jul-2017	86.79	m^3/ week	6.299	m	

Remarks: Reference to Monthly Progress Report (July-2017)

6) (c)Ground Subsidence Hydrology

Duration (Week)	Water Consumption		Ground Level		Note
	Quantity	Unit	Quantity	Unit	
3-Aug-2017	107.33	m^3/ week	6.299	m	
10-Aug-2017	116.6	m^3/ week	6.298	m	
17-Aug-2017	114.15	m^3/ week	6.298	m	
24-Aug-2017	115.15	m^3/ week	6.299	m	
31-Aug-2017	113.24	m^3/ week	6.299	m	

Remarks: Reference to Monthly Progress Report (August-2017)

7) Offensive Odor (only operation phase)

Complaints from Residents

- Are there any complaints from residents regarding offensive odor in this monitoring period? ☐ Yes, ☑ No
  If yes, please describe the contents of complains and its countermeasures to fill in below the table.

Contents of Complaints from Residents	Countermeasures

Situations environmental report from tenants

- Are there any serious issues regarding offensive odor in this monitoring period? ☐ Yes, ☑ No
  If yes, please describe the contents of complains and its countermeasures to fill in below the table.

Contents of Issues on Soil Contamination	Countermeasures

8) Infectious disease, Working Environment, Accident

Information from contractor (construction phase) or tenants (operation phase)

- Are there any incidents regarding infectious disease, Working Environment, Accident in this monitoring period? ☐ Yes, ☑ No
  If yes, please describe the contents of complains and its countermeasures to fill in below the table.

Contents of Incidents	Countermeasures

Note: If emergency incidents are occurred, the information shall be reported to the relevant organizations and authorities immediately.

9) Resettlement Works for Project Affected Persons (PAPs) and Common Assets

Information from TSMC

- Please describe the progress and remarkable issues (if any) to fill in below the table.

Resentment Works		Progress in Narrative	Remarkable Issues
Projected Affected Persons	Land Acquisition and Relocation	Land Acquisition was taken from 15 numbers of Project Affected Households. (7) PAHs from Area 2-1 and (83) PAHs from Area 2-2 (East) will be relocated in Myaing Thar Yar village, Naung Waing Village Tract in Kyauktan Township at the end of June 2017.	
	Income Restoration Program		
Common Assets	Relocation		

- Are there any grievances submitted, solved and pending regarding resettlement works? ☐ Yes, ☑ No
  If yes, please describe the contents of grievances to fill in below the table.

Contents of Grievance	Response/ Countermeasures

10) CSR activities such as Community Support Program
- Are there any CSR activities implemented in this monitoring period? ☑ Yes, ☐ No

If yes, please describe the outline of CSR activities implemented to fill in below the table.

Date	Activities	Description (Location, Participant etc)
June 2017 to March 2018	Scholarship Program	Annual supporting program for high school students. This program is supported 11 high school students (6 grade-7 students and 5 grade-9 students)
27th July 2017	Planting activity for green environment	Location – PAP relocation site Zone B Participant – PAP household people, village head and MJTD officers
25th August 2017	Pregnant women nutrition in Kyauk Tan region	Supporting activity for pregnant women in activity as social welfare Location – Kyauk Tan hospital Participant – pregnant women and authorized person from hospital
22nd August 2017	Health supporting activity for community	Supported hand gel and hand wash for Thanlyin & Kyauk Tan region which affected by H1N1
23rd August 2017	Garbage collection activity	Location – Alwan Sut village Participant – Villagers and Dowa garbage collection team
14th August 2017	Basic English class for community (2nd batch)	Location – Myaing Thar Yar Kindergarten school Participant – 10 standard passed students around Thanlyin kyauk tan region

End of Document

Thilawa Special Economic Zone (Zone B)
Development Project –Phase 1

Appendix

Water and Waste Water Monitoring Report

June 2017

WATER QUALITY MONITORING REPORT

FOR DEVELOPMENT OF INDUSTRIAL AREA

IN THILAWA SEZ ZONE B

(PHASE 1 CONSTRUCTION STAGE)

(Bi-Monthly Monitoring)

June 2017

Myanmar Koei International Ltd.

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CHAPTER 1: INTRODUCTION

1.1 General

Thilawa Special Economic Zone (SEZ) is located in southern district of Yangon region and about 23 km southeast of Yangon city. As the developer of Thilawa SEZ, Myanmar Japan Thilawa Development Ltd. (MJTD) has a responsibility to carry out regular monitoring in the industrial area of Zone B in accordance with the approved Environmental Impact Assessment (EIA) report and Environmental Management Plan (EMP). MJTD has implemented monitoring various environmental items with the specified time frame to know the environmental conditions in and around the area. As for the monitoring of the water quality, total six sampling points are set for water quality survey, named SW-2, SW-3, SW-4, SW-7, SW-8 and GW-2 have been monitored in Thilawa SEZ and its surrounding area in timely manner. Among the six locations, SW-7 is main discharging point of Zone B during the construction stage. Moreover, GW-2 is monitored as a reference of existing tube well which located in the monastery compound of Phalan village. Location of sampling points for water quality monitoring is shown in Figure 1.1-1.

Figure 1.1- 1 Location of Sampling Points of Water Quality Monitoring

CHAPTER 2: WATER QUALITY MONITORING

2.1 Monitoring Items

Sampling points and parameters for water quality monitoring are determined to cover the environmental monitoring plan of the EIA report.

Water quality sampling was carried out at six locations. Among the six locations, water flow measurement was carried out at two locations (SW-2 and SW-4) where can be measured by current meter. Monitoring items and sampling points are summarized in Table 2.1-1.

Table 2.1-1 Monitoring Items for Water Quality

No.	Parameters	SW-2	SW-3	SW-4	SW-7	SW-8	GW-2	Remarks
1	pH	O	O	O	O	O	O	On-site measurement
2	Water temperature	O	O	O	O	O	O	On-site measurement
3	DO	O	O	O	O	O	O	On-site measurement
4	BOD (5)	O	O	O	O	O	O	Laboratory analysis
5	COD (Cr)	O	O	O	O	O	O	Laboratory analysis
6	Suspended solids	O	O	O	O	O	O	Laboratory analysis
7	Total coliform	O	O	O	O	O	O	Laboratory analysis
8	Oil and grease	O	O	O	O	O	O	Laboratory analysis
9	Chromium	O	O	O	O	O	O	Laboratory analysis
10	Flow Rate	O	-	O	-	-	-	On-site measurement

Source: Myanmar Koei International Ltd.

2.2 Description of Sampling Points

The outline of sampling points is mentioned in Table 2.2-1. The photos of conducting field survey at each sampling points are mentioned in Appendix-1.

Table 2.2-1 Outline of Sampling Points

No.	Station	Detailed Information
1	SW-2	**Coordinate**- N-16° 40' 20.70", E- 96° 17' 18.70"
		Location - Upstream of Shwe Pyauk Creek
		Survey Item – Surface water sampling.
2	SW-3	**Coordinate**- N-16° 40' 5.50", E- 96° 16' 41.60"
		Location - Upstream of Shwe Pyauk Creek, mixing point of Thilawa SEZ Zone A and Zone B.
		Survey Item – Surface water sampling.
3	SW-4	**Coordinate**- N-16° 39' 41.00", E- 96° 16' 26.50"
		Location - Downstream of Shwe Pyauk Creek
		Survey Item – Surface water sampling.
4	SW-7	**Coordinate**- N-16° 40' 18.90", E- 96° 17' 17.50"
		Location - Discharge drain of Zone B construction site before connect to Shwe Pyauk Creek
		Survey Item – Discharge water sampling.
5	SW-8	**Coordinate**- N-16° 40' 18.90", E- 96° 17' 17.50"
		Location – Upstream of Shwe Pyauk Creek, mixing point of SW-2 and discharge water from construction site of Zone B.
		Survey Item – Surface water sampling.
6	GW-2	**Coordinate**- N- 16° 39' 25.30", E- 96° 17' 15.60"E
		Location – In the monastery compound of Phalan village
		Survey Item – Ground water sampling.

Source: Myanmar Koei International Ltd.

SW-2 (Reference Point)

SW-2 was collected at the upstream of Shwe Pyauk creek and the distance is about 50 m upstream of SW-7. This sampling point is located at the northeast of Zone B area and at the south of Dagon-Thilawa road. The surrounding area are Zone A in the northwest, local industrial zone in the east and paddy field in the west respectively.

SW-3 (Reference Point)

SW-3 was collected at the Shwe Pyauk creek, mixing point of Zone A and Zone B, which is flowing from east to west and then entering into the Yangon river. The distance is about 1.2 km downstream of SW-7. This sampling point is located at south of Zone A area and Dagon-Thilawa road. The surrounding area are Zone A in the north, Zone B in the south, local industrial zone in the east and paddy field in the south and west respectively.

SW-4 (Reference Point)

SW-4 was collected at the downstream of Shwe Pyauk creek, after mixing of discharged water from local industrial zone, construction site of Zone B and Zone A, which is flowing from east to west and then entering into the Yangon river. The distance is about 800 m downstream of SW-3. This sampling point is located at north of Zone A area and Dagon-Thilawa road. The surrounding area are Zone A in the north, Zone B in the south, local industrial zone in the east and paddy field in the south and west respectively.

SW-7 (Discharging Point)

SW-7 is main discharging point of Zone B during construction stage. This sampling point is located at the northeast of Zone B area and at the south of Dagon-Thilawa road. The surrounding area are Zone A in the northwest, local industrial zone in the east and paddy field in the west respectively.

SW-8

SW-8 is mixing point of discharge water from Zone B construction site and local industrial zone, upstream of Shwe Pyauk creek. This sampling point is almost same location as SW-7 and it is at the Shwe Pyauk creek.

GW-2 (Reference of Existing Tube Well)

GW-2 was collected from tube well as ground water sample. It is located in the monastery compound of Phalan village. The surrounding area are Thilawa SEZ Zone A in north, Phalan village in the south and fields in west and local industrial zone in northeast, and construction of Thilawa SEZ Zone B in east and northeast respectively.

2.3 Monitoring Method

All water samples were collected with cleaned sampling bottle and analyzed by the following standard method as shown in Table 2.3-1. All samples were kept in iced boxes keeping at 2-4° C and were transported to the laboratory. Among the parameters; water temperature, pH and DO, were measured by the on-site instrument "Horiba, U-52" and water flow rate was also conducted by using the on-site instrument "Tamaya Digital Current Meter".

Table 2.3-1 Analytic Method for Water Quality

No.	Parameter	Method
1	Temperature	Instrument Analysis Method (Horiba, U-52, Multi Water Quality Checker)
2	pH	Instrument Analysis Method (Horiba, U-52, Multi Water Quality Checker)
3	Dissolved oxygen (DO)	Instrument Analysis Method (Horiba, U-52, Multi Water Quality Checker)
4	BOD (5)	APHA 5210 B (5 days BOD Test)
5	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)
6	Suspended solids (SS)	APHA 2540D (Dry at 103-105℃ Method)
7	Total coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)
8	Oil and grease	APHA 5520B (Partition-Gravimetric Method)
9	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
10	Flow Rate	Detection of Electromagnetic Elements (Real-time measurement by UC-200V Digital Current Meters)

Source: Myanmar Koei International Ltd.

2.4 Monitoring Period

Water quality and water flow rate monitoring were conducted on 27th June 2017 and sampling time is shown in Table 2.4-1 to avoid tidal effect. The tide record for Yangon river, Myanmar on 27th June 2017 is shown in Table 2.4-2.

Table 2.4-1 Sampling Time of Each Station

No.	Station	Sampling Time
1	SW-2	27/6/2017 9:41
2	SW-3	27/6/2017 11:22
3	SW-4	27/6/2017 12:10
4	SW-7	27/6/2017 10:37
5	SW-8	27/6/2017 10:37
6	GW-2	27/6/2017 16:00

Source: Myanmar Koei International Ltd.

Table 2.4-2 Tide Record for Yangon River, Myanmar

Date	Time	Height	Tide Conditions
27/6/2017	02:10	0.89	Low Tide
	06:29	5.89	High Tide
	13:56	1.08	Low Tide
	18:37	6.24	High Tide

Source: Myanma Port Authority, Tide Table for the Yangon River and Elephant Point, 2017

2.5 Monitoring Results

Results of water quality monitoring at discharge point and discharged creek is summarized in Table 2.5-1. Analytical results of the laboratory are described in Appendix-2. The results were compared with the target value of effluent water quality discharging to water body stipulated in the EIA report.

2.5.1 Results of Discharging points and Discharged Creek

As the comparison with the target value, the results of SS and total coliform were exceeded than the target value. As for the result of SS, results at the surface water monitoring points (SW-2, SW-3, SW-4, SW-7 and SW-8) exceeded the target value due to three expected reasons; i) surface water run-off from bare land in Zone B, ii) delivered from upstream area such as natural origin and wastewater from local industrial zone outside of Thilawa SEZ, and iii) influence by water from the downstream of monitoring points due to flow back by tidal fluctuation.

As for the result of total coliform of surface water, results at the other surface water monitoring points (SW-2, SW-3, SW-4, SW-7 and SW-8) exceeded the target value due to two expected reasons; i) natural bacteria existed in discharged creek because there are various kinds of vegetation and creature such as birds, and small animals in and along the discharged creek and ii) wastewater from the local industrial zone outside of Thilawa SEZ.

Table 2.5-1 Results of Water Quality Monitoring at Discharge point and Discharged Creek

No.	Parameters	Unit	SW-2	SW-3	SW-4	SW-7	SW-8	Target Value
1	Temperature	°C	26.8	27.9	28.2	28.3	28.3	40.0
2	pH	-	7.3	6.9	7.1	7.3	7.3	6.0~9.0
3	Suspended solid (SS)	mg/L	38	70	82	36	36	30
4	Dissolved oxygen (DO)	mg/L	4.43	3.38	6.86	4.79	4.79	-
5	BOD (5)	mg/L	1.71	0.00	2.99	0.00	0.00	20.00
6	COD (Cr)	mg/L	21.5	11.3	11.6	21.0	21.0	70.0
7	Total coliform	MPN/ 100ml	92,000	35,000	54,000	>160,000	>160,000	400
8	Oil and grease	mg/L	4.73	< 3.10	< 3.10	4.18	4.18	10.00
9	Chromium	mg/L	≤0.002	≤0.002	≤0.002	≤0.002	≤0.002	0.500
10	Flow rate	m^3/s	0.25	-	1.81	-	-	-

Source: Myanmar Koei International Ltd.

2.5.2 Result of Reference Tube Well

Result of water quality monitoring at reference monitoring point is shown in Table 2.5-2. All parameters of result are below the target value.

Table 2.5-2 Results of Water Quality Monitoring at Reference Tube Well

No.	Parameters	Unit	GW-2	Target Value
1	Temperature	°C	28.0	40.0
2	pH	-	7.0	6.0–9.0
3	Suspended solid (SS)	mg/L	6.00	30
4	Dissolved oxygen (DO)	mg/L	7.71	-
5	BOD (5)	mg/L	2.41	20.00
6	COD (Cr)	mg/L	< 0.7	70.0
7	Total coliform	MPN/ 100ml	23	400
8	Oil and grease	mg/L	< 3.10	10.00
9	Chromium	mg/L	≤0.002	0.500
10	Escherichia coli	100ml	-	-
11	Flow Rate	m^3/s	-	-

Source: Myanmar Koei International Ltd.

CHAPTER 3: CONCLUSION AND RECOMMENDATIONS

As described in Chapter 2 (Section 2.5), parameter of SS and total coliform in surface water were exceeded the target value at SW-2, SW-3, SW-4, SW-7 and SW-8 in this period for construction stage of Thilawa SEZ Zone B.

For SW-2, SW-3, SW-4, SW-7 and SW-8, there are some possible reasons for exceeding the target values of SS and total coliform due to delivered from upstream area such as natural origin and wastewater from the local industrial zone outside of Thilawa SEZ, surface water run-off from bare land in Zone B and delivered from surrounding area by tidal effect. However, it cannot reach to the conclusion of what is the reason to be exceeded the target values, the continuous monitoring and seasonal data and yearly trend analysis will be necessary.

As for future subject for main discharging points of Thilawa SEZ Zone B, the following action may be taken to achieve the target levels and appropriate water quality monitoring:

- To monitor Escherichia coli (E. Coli) level to identify health impact by coliform bacteria; and
- To examine the possibility of the overflow water from construction sites.

End of the Document

APPENDIX-1 FIELD SURVEY PHOTOS

FOR DISCHARGING POINT OF THILAWA SEZ ZONE B

Surface water sampling and onsite measurement at SW-7 and SW-8

FOR REFERENCE MONITORING POINTS FOR COMPARISON WITH DISCHARGING POINTS AND BASELINE OF DISCHARGED CREEK

Surface water sampling and onsite measurement at SW-2

Surface water sampling and onsite measurement at SW-3

Surface water sampling and onsite measurement at SW-4

Ground water sampling and onsite measurement at GW-2

APPENDIX-2 LABORATORY RESULTS

FOR DISCHARGING POINT

DOWA

GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD.
[illegible]

Report No. : GEM-LAB-201707069
Revision No. : 1
Report Date : 11 July, 2017
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa
Project Name : -
Sample Description

Sample Name : MKI-SW-7-0627 — Sampling Date : 27 June, 2017
Sample No. : W-1706212 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 27 June, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105°C Method)	mg/l	38.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	1.00	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	21.0	0.7
4	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	4.18	3.1
5	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	< 0.002	0.002
6	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	> 160000	1.8

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 Supervisor

LAB GEM

Approved By
Tomoya Suzuki
Director

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED
MJTD

FOR REFERENCE MONITORING POINTS FOR COMPARISON WITH DISCHARGING POINTS AND BASELINE OF DISCHARGED CREEK

DOWA

[illegible]

Report No : GEM-LAB-2017070366
Revision No : 1
Report Date : 11 July, 2017
Application No : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No 1A /2B, Mya Thidar Housing, Ward 11, South Okkalapa
Project Name :
Sample Description :
Sample Name : MKI SW 2 0617 Sampling Date : 27 June, 2017
Sample No : W 1706209 Sampling By : Customer
Waste Profile No : Sample Received Date : 27 June, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	TS	APHA 2540D (Dry at 103-105°C Method)	mg/l	38 00	
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	< 71	0.90
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	21.8	0.7
4	Oil and Grease	APHA 5520B (Partition Gravimetric Method)	mg/l	< 7.1	3.1
5	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	5,000	1.8
6	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	1.9	0.2
7	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	< 0.05	0.03
8	Color	APHA 2120C (Spectrophotometric Method)	TCU	64.79	0.90
9	Odor	APHA 2150 B (Threshold Odor Test)	TON	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	< 0.002	0.002
12	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.018	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	< 0.001	0.001
15	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	< 0.01	0.01
16	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.004	0.002
17	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	< 0.002	0.002
18	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.018	0.001
19	Nickel	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.008	0.002
20	Cyanide	HACH 8027 (Pyridine - Pyrazolone Method	mg/l	0.026	0.002
21	Free Chlorine	APHA 4500 Cl G (DPD Colorimetric Method)	mg/l	0.1	0.1
22	Sulphide	HACH 8131 (USEPA Methylene Blue Method)	mg/l	0.065	0.025
23	Formaldehyde	HACH 8110 (MBTH Method)	mg/l	0.052	0.001
24	Phenol	[illegible]	mg/l	< 0.001	0.002

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

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DOWA

GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD.
[illegible]
[illegible]

Report No : GEM-LAB-201707067
Revision No : 1
Report Date : 11 July, 2017
Application No : 9049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No. LA /3B, Pya Thidar Housing, Ward 11, South Okkalapa
Project Name : -
Sample Description

Sample Name : MKI-SW-3-0627
Sample No : W-1706210
Waste Profile No : -

Sampling Date : 27 June, 2017
Sampling By : Customer
Sample Received Date : 27 June, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105C Method)	mg/l	70.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	9.00	3.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	11.3	6.7
4	Oil and Grease	APHA 5520B (Partition Gravimetric Method)	mg/l	< 3.1	3.1
5	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	33000	1.8
6	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	2.0	0.5
7	Total Phosphorus	APHA 4500-P E (Ascorbic Acid Method)	mg/l	< 0.05	0.05
8	Color	APHA 2120C (Spectrophotometric Method)	TCU	27.49	5.00
9	Odor	APHA 2150 B (Threshold Odor Test)	TON	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	0.017	0.002
12	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.010	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	< 0.001	0.001
15	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	< 0.01	0.01
16	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.004	0.002
17	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.002	0.001
18	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.028	0.001
19	Nickel	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.018	0.002
20	Cyanide	HACH 8027 (Pyridine - Pyrazalone Method)	mg/l	0.323	0.002
21	Free Chlorine	APHA 4500 Cl G (DPD Colorimetric Method)	mg/l	0.0	0.1
22	Sulphide	HACH 8131 (USEPA Methylene Blue Method)	mg/l	0.166	0.005
23	Formaldehyde	HACH 8110 (MBTH Method)	mg/l	0.092	0.003
24	Phenol	USEPA Method 420.1 (Phenolics (Spectrophotometric, Manual 4AAP with Distillation))	mg/l	0.008	0.002

Remark : LOQ : Limit of Quantitation
APHA : American Public Health Association (APHA), the American Water Works Association (AWWA), and the Water Environment Federation (2012), Standard Methods for the Examination of Water and Wastewater, 22nd edition

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DOWA

GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD.

Report No : GEM-LAB-201707068
Revision No : 1
Report Date : 11 July, 2017
Application No : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa
Project Name : -
Sample Description
Sample Name : MKI-SW-A-0617 — Sampling Date : 27 June, 2017
Sample No : W-1706211 — Sampling By : Customer
Waste Profile No : - — Sample Received Date : 27 June, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105°C Method)	mg/l	82.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	[illegible]	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	11.6	0.7
4	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
5	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	54000	1.8
6	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	1.7	0.5
7	Total Phosphorus	APHA 4500-P E (Ascorbic Acid Method)	mg/l	< 0.05	0.05
8	Color	APHA 2120C (Spectrophotometric Method)	TCU	26.75	0.00
9	Odor	APHA 2150 B (Threshold Odor Test)	TON	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	0.004	0.002
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	< 0.001	0.001
15	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	< 0.01	0.01
16	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.004	0.002
17	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.002	0.001
18	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.324	0.001
19	Nickel	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.216	0.002
20	Cyanide	HACH 8027 (Pyridine - Pyrazalone Method)	mg/l	0.171	0.002
21	Free Chlorine	APHA 4500 Cl G (DPD Colorimetric Method)	mg/l	1.3	0.1
22	Sulphide	HACH 8131 (USEPA Methylene Blue Method)	mg/l	0.218	0.005
23	Formaldehyde	HACH 8110 (MBTH Method)	mg/l	0.588	0.003
24	Phenol	USEPA Method 420.1 (Phenolics (Spectrophotometric, Manual 4AAP with Distillation))	mg/l	< 0.002	0.002

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

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MJTD

DOWA

GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD

Report No. : GEM-LAB-201707070
Revision No. : 1
Report Date : 11 July, 2017
Application No. : 0149-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa
Project Name : -
Sample Description
Sample Name : MKI-GW-2-0627 Sampling Date : 27 June, 2017
Sample No. : W-1706213 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 27 June, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105 C Method)	mg/l	6.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	2.41	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	< 0.7	0.7
4	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
5	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	< 0.002	0.002
6	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	23.0	1.8

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

Analysed By :
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Approved By :
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MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED
MJTD

Thilawa Special Economic Zone (Zone B)
Development Project –Phase 1

Appendix

Air Quality Monitoring Report

July 2017

AIR QUALITY MONITORING

REPORT

FOR DEVELOPMENT OF INDUSTRIAL AREA

THILAWA SEZ ZONE B

(PHASE 1 CONSTRUCTION STAGE)

(QUARTERLY MONITORING)

July 2017

Myanmar Koei International Ltd.

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CHAPTER 1: OUTLINES AND SUMMARY OF MONITORING PLAN

1.1 General

Thilawa Special Economic Zone (TSEZ) is located in southern district of Yangon region and about 23 km southeast of Yangon city. As the developer of Thilawa SEZ, Myanmar Japan Thilawa Development Ltd. (MJTD) has a responsibility to carry out regular environmental monitoring in the industrial area of Zone B in accordance with the approved Environmental Impact Assessment (EIA) report with Environmental Management Plan (EMP). MJTD has implemented monitoring various environmental items with the specified time frame to know the environmental conditions in and around the area.

1.2 Outlines of Monitoring Plan

To assess the environmental condition under the construction of industrial area in and around Thilawa SEZ Zone B, Air quality had been monitored from 3rd July 2017 – 10th July 2017 as follows;

Table 1.2-1 Outlines of Air Quality Monitoring Plan

Monitoring Date	Monitoring Item	Parameters	Number of Point	Duration	Monitoring Methodology
From 3rd July– 10th July, 2017	Air Quality	CO, NO_2, $PM_{2.5}$, PM_{10}, and SO_2	1	7 Days	On site measurement by Haz-Scanner Environmental Perimeter Air Station (EPAS)

CHAPTER 2: AIR QUALITY MONITORING

2.1 Monitoring Item

The parameters for air quality monitoring were CO, NO_2, $PM_{2.5}$, PM_{10}, and SO_2.

2.2 Monitoring Location

The air quality measurement equipment, "Haz-Scanner Environmental Perimeter Air Station (EPAS) was set up at the south of the Thilawa SEZ Zone B, N: 16°39'24.20", E: 96°17'15.80", inside the monastery compound of Phalan village, surrounded by the residential houses of Phalan village in the south and fields in west, Thilawa SEZ Zone A in north, local Thilawa Industrial Zone in northeast, and construction of Thilawa SEZ Zone B in east and northeast respectively. The air quality monitoring is carried out above location where is near to the residential houses of Phalan village. Possible emission sources are dust emissions from construction activities and exhaust emissions from construction fuel-burning equipment and daily human activities in Phalan village. The location of air quality monitoring is shown in the Figure 2.2-1.

Figure 2.2-1 Location of Air Quality Monitoring Point

2.3 Monitoring Period

Air quality monitoring was conducted seven consecutive days from 3rd July – 10th July, 2017.

2.4 Monitoring Method

Monitoring of CO, NO_2, $PM_{2.5}$, PM_{10}, and SO_2 were conducted by referring to the recommendation of the United States Environmental Protection Agency (U.S. EPA). The Haz-Scanner EPAS was used to collect ambient air pollutants. The EPAS measures automatically every one minute and directly read and recorded onsite for CO, NO_2, $PM_{2.5}$, PM_{10}, and SO_2. The state of air quality monitoring is shown in Figure 2.4-1.

Figure 2.4-1 Status of Air Quality Monitoring Point

2.5 Monitoring Results

The daily average value of air quality monitoring results of CO, NO_2, $PM_{2.5}$, PM_{10}, and SO_2 are described in Table 2.5-1. Construction activities of Thilawa SEZ Zone B are described in Table 2.5-2. Comparing with the target value of CO, NO_2, $PM_{2.5}$, PM_{10}, and SO_2 prescribed in EIA report for Thilawa SEZ development project Zone B, all of results are not exceeded the target value.

Table 2.5-1 Air Quality Monitoring Result (Daily Average)

Date	CO	NO_2	$PM_{2.5}$	PM_{10}	SO_2
	ppm	ppm	mg/m^3	mg/m^3	ppm
03 ~ 04 Jul, 2017	0.027 (0.031 mg/m^3)	0.032 (0.060 mg/m^3)	0.017	0.029	0.008 (0.020 mg/m^3)
04 ~ 05 Jul, 2017	0.021 (0.024 mg/m^3)	0.032 (0.060 mg/m^3)	0.010	0.016	0.005 (0.013 mg/m^3)
05 ~ 06 Jul, 2017	0.029 (0.033 mg/m^3)	0.034 (0.064 mg/m^3)	0.009	0.012	0.005 (0.013 mg/m^3)
06 ~ 07 Jul, 2017	0.022 (0.025 mg/m^3)	0.036 (0.068 mg/m^3)	0.011	0.010	0.007 (0.018 mg/m^3)
07 ~ 08 Jul, 2017	0.027 (0.031 mg/m^3)	0.035 (0.066 mg/m^3)	0.010	0.010	0.006 (0.016 mg/m^3)
08 ~ 09 Jul, 2017	0.023 (0.026 mg/m^3)	0.036 (0.068 mg/m^3)	0.010	0.010	0.007 (0.018 mg/m^3)
9 ~ 10 Jul, 2017	0.033 (0.038 mg/m^3)	0.037 (0.070 mg/m^3)	0.010	0.016	0.007 (0.018 mg/m^3)
7 Days Average Value	0.026 (0.030 mg/m^3)	0.035 (0.065 mg/m^3)	0.011	0.015	0.006 (0.017 mg/m^3)
Target Value	9.000 (10.26 mg/m^3)*1	0.050 (0.1 mg/m^3)*1	0.025	0.050	0.008 (0.02 mg/m^3)

Note: The target value of CO, NO_2 and SO_2 were converted to ppm units from mg/m^3.

Table 2.5-2 Construction Activities of Thilawa SEZ Zone B

Date	Time	Location	Construction Activities
03 Jul, 2017	8:30-12:00	Near monastery	Excavation
	13:00-18:00	Near monastery	Excavation
04 Jul, 2017	8:30-12:00	Near monastery	Excavation, Backfilling
	13:00-18:00	Near monastery	Excavation, Backfilling
05 Jul, 2017	8:30-12:00	Near monastery	Rebar installation, Backfilling
	13:00-18:00	Near monastery	Rebar installation, Backfilling
06 Jul, 2017	8:30-12:00	Near monastery	Rebar installation, Backfilling
	13:00-18:00	Near monastery	Rebar installation, Backfilling
07 Jul, 2017	8:30-12:00	Near monastery	Soft soil removing
	13:00-18:00	Near monastery	Soft soil removing
08 Jul, 2017	8:30-12:00	Near monastery	Off
	13:00-18:00	Near monastery	Off
09 Jul, 2017	8:30-12:00	Near monastery	Soft soil removing
	13:00-18:00	Near monastery	Soft soil removing
10 Jul, 2017	8:30-12:00	Near monastery	Backfilling, RBC cleaning
	13:00-18:00	Near monastery	Backfilling
11 Jul, 2017	8:30-12:00	Near monastery	Material delivery, backfilling, compaction, soft soil removing
	13:00-18:00	Near monastery	Backfilling, compaction, soft soil removing

CHAPTER 3: CONCLUSION AND ISSUES TO BE SOLVED

The result of air quality of CO, NO_2, $PM_{2.5}$, PM_{10} and SO_2 in each day are not exceeded the target value, thus there are no significant impacts on the surrounding air quality.

The continuous monitoring will be necessary to grasp the environmental conditions in construction stage of Thilawa SEZ Zone B. The mitigation measures for environmental management will be considered in collected periodical environmental data has been reviewed in future.

APPENDIX - HOURLY AIR RESULT

Date	Time	CO	NO_2	$PM_{2.5}$	PM_{10}	SO_2
		ppm	ppm	mg/m^3	mg/m^3	ppm
		Hourly	Hourly	Hourly	Hourly	Hourly
03 Jul, 2017	10:00 ~ 10:59	0.000	0.063	0.169	0.152	0.000
03 Jul, 2017	11:00 ~ 11:59	0.046	0.036	0.014	0.031	0.006
03 Jul, 2017	12:00 ~ 12:59	0.010	0.032	0.013	0.016	0.003
03 Jul, 2017	13:00 ~ 13:59	0.021	0.041	0.008	0.021	0.002
03 Jul, 2017	14:00 ~ 14:59	0.038	0.039	0.009	0.023	0.005
03 Jul, 2017	15:00 ~ 15:59	0.023	0.038	0.014	0.028	0.009
03 Jul, 2017	16:00 ~ 16:59	0.071	0.035	0.018	0.035	0.016
03 Jul, 2017	17:00 ~ 17:59	0.150	0.038	0.007	0.009	0.015
03 Jul, 2017	18:00 ~ 18:59	0.014	0.030	0.008	0.013	0.002
03 Jul, 2017	19:00 ~ 19:59	0.037	0.035	0.011	0.026	0.008
03 Jul, 2017	20:00 ~ 20:59	0.002	0.031	0.012	0.032	0.004
03 Jul, 2017	21:00 ~ 21:59	0.004	0.031	0.013	0.027	0.003
03 Jul, 2017	22:00 ~ 22:59	0.000	0.027	0.012	0.023	0.011
03 Jul, 2017	23:00 ~ 23:59	0.000	0.025	0.010	0.023	0.008
04 Jul, 2017	0:00 ~ 0:59	0.000	0.025	0.008	0.024	0.012
04 Jul, 2017	1:00 ~ 1:59	0.001	0.028	0.007	0.023	0.012
04 Jul, 2017	2:00 ~ 2:59	0.001	0.030	0.007	0.020	0.011
04 Jul, 2017	3:00 ~ 3:59	0.001	0.028	0.008	0.021	0.010
04 Jul, 2017	4:00 ~ 4:59	0.003	0.030	0.013	0.020	0.008
04 Jul, 2017	5:00 ~ 5:59	0.027	0.032	0.010	0.018	0.017
04 Jul, 2017	6:00 ~ 6:59	0.085	0.033	0.009	0.019	0.015
04 Jul, 2017	7:00 ~ 7:59	0.045	0.031	0.012	0.033	0.006
04 Jul, 2017	8:00 ~ 8:59	0.022	0.021	0.015	0.030	0.004
04 Jul, 2017	9:00 ~ 9:59	0.036	0.021	0.009	0.022	0.010

Max	0.150 (0.172 mg/m^3)	0.063 (0.119 mg/m^3)	0.169	0.152	0.017 (0.044 mg/m^3)
Avg	0.027 (0.031 mg/m^3)	0.032 (0.060 mg/m^3)	0.017	0.029	0.008 (0.020 mg/m^3)
Min	0.000 (0.000 mg/m^3)	0.021 (0.040 mg/m^3)	0.007	0.009	0.000 (0.000 mg/m^3)

Date	Time	CO	NO_2	$PM_{2.5}$	PM_{10}	SO_2
		ppm	ppm	mg/m^3	mg/m^3	ppm
		Hourly	Hourly	Hourly	Hourly	Hourly
04 Jul, 2017	10:00 ~ 10:59	0.011	0.024	0.003	0.010	0.009
04 Jul, 2017	11:00 ~ 11:59	0.005	0.018	0.002	0.004	0.012
04 Jul, 2017	12:00 ~ 12:59	0.004	0.023	0.009	0.014	0.007
04 Jul, 2017	13:00 ~ 13:59	0.007	0.027	0.018	0.016	0.000
04 Jul, 2017	14:00 ~ 14:59	0.011	0.031	0.007	0.011	0.001
04 Jul, 2017	15:00 ~ 15:59	0.010	0.034	0.021	0.030	0.001
04 Jul, 2017	16:00 ~ 16:59	0.036	0.036	0.013	0.008	0.001
04 Jul, 2017	17:00 ~ 17:59	0.009	0.036	0.017	0.014	0.005
04 Jul, 2017	18:00 ~ 18:59	0.014	0.039	0.008	0.011	0.012
04 Jul, 2017	19:00 ~ 19:59	0.026	0.035	0.006	0.012	0.008
04 Jul, 2017	20:00 ~ 20:59	0.005	0.033	0.004	0.016	0.003
04 Jul, 2017	21:00 ~ 21:59	0.002	0.028	0.007	0.022	0.001
04 Jul, 2017	22:00 ~ 22:59	0.020	0.037	0.008	0.013	0.012
04 Jul, 2017	23:00 ~ 23:59	0.027	0.032	0.015	0.029	0.013
05 Jul, 2017	0:00 ~ 0:59	0.012	0.034	0.008	0.019	0.004
05 Jul, 2017	1:00 ~ 1:59	0.000	0.033	0.005	0.016	0.003
05 Jul, 2017	2:00 ~ 2:59	0.009	0.033	0.006	0.017	0.001
05 Jul, 2017	3:00 ~ 3:59	0.003	0.033	0.010	0.019	0.000
05 Jul, 2017	4:00 ~ 4:59	0.016	0.037	0.012	0.015	0.000
05 Jul, 2017	5:00 ~ 5:59	0.030	0.040	0.021	0.025	0.001
05 Jul, 2017	6:00 ~ 6:59	0.094	0.039	0.012	0.012	0.001
05 Jul, 2017	7:00 ~ 7:59	0.131	0.036	0.007	0.014	0.007
05 Jul, 2017	8:00 ~ 8:59	0.009	0.031	0.007	0.017	0.005
05 Jul, 2017	9:00 ~ 9:59	0.011	0.027	0.003	0.012	0.006

Max	0.131 (0.150 mg/m^3)	0.040 (0.075 mg/m^3)	0.021	0.030	0.013 (0.034 mg/m^3)
Avg	0.021 (0.024 mg/m^3)	0.032 (0.060 mg/m^3)	0.010	0.016	0.005 (0.013 mg/m^3)
Min	0.000 (0.000 mg/m^3)	0.018 (0.034 mg/m^3)	0.002	0.004	0.000 (0.000 mg/m^3)

Date	Time	CO	NO2	PM2.5	PM10	SO2
		ppm	ppm	mg/m³	mg/m³	ppm
		Hourly	Hourly	Hourly	Hourly	Hourly
05 Jul, 2017	10:00 ~ 10:59	0.010	0.041	0.019	0.021	0.001
05 Jul, 2017	11:00 ~ 11:59	0.008	0.037	0.007	0.010	0.002
05 Jul, 2017	12:00 ~ 12:59	0.004	0.029	0.004	0.006	0.010
05 Jul, 2017	13:00 ~ 13:59	0.008	0.015	0.006	0.014	0.008
05 Jul, 2017	14:00 ~ 14:59	0.006	0.025	0.008	0.016	0.004
05 Jul, 2017	15:00 ~ 15:59	0.075	0.044	0.011	0.006	0.002
05 Jul, 2017	16:00 ~ 16:59	0.044	0.042	0.014	0.008	0.002
05 Jul, 2017	17:00 ~ 17:59	0.065	0.044	0.010	0.008	0.001
05 Jul, 2017	18:00 ~ 18:59	0.019	0.040	0.011	0.011	0.001
05 Jul, 2017	19:00 ~ 19:59	0.024	0.041	0.008	0.007	0.004
05 Jul, 2017	20:00 ~ 20:59	0.012	0.041	0.008	0.008	0.001
05 Jul, 2017	21:00 ~ 21:59	0.015	0.041	0.008	0.010	0.000
05 Jul, 2017	22:00 ~ 22:59	0.009	0.038	0.010	0.012	0.002
05 Jul, 2017	23:00 ~ 23:59	0.027	0.038	0.006	0.006	0.007
06 Jul, 2017	0:00 ~ 0:59	0.052	0.037	0.008	0.014	0.006
06 Jul, 2017	1:00 ~ 1:59	0.004	0.030	0.005	0.012	0.004
06 Jul, 2017	2:00 ~ 2:59	0.009	0.033	0.009	0.025	0.003
06 Jul, 2017	3:00 ~ 3:59	0.006	0.032	0.015	0.022	0.004
06 Jul, 2017	4:00 ~ 4:59	0.026	0.035	0.008	0.017	0.003
06 Jul, 2017	5:00 ~ 5:59	0.120	0.035	0.013	0.020	0.006
06 Jul, 2017	6:00 ~ 6:59	0.148	0.036	0.013	0.020	0.007
06 Jul, 2017	7:00 ~ 7:59	0.012	0.022	0.004	0.009	0.002
06 Jul, 2017	8:00 ~ 8:59	0.000	0.015	0.003	0.002	0.007
06 Jul, 2017	9:00 ~ 9:59	0.000	0.018	0.002	0.001	0.026

Max	0.148 (0.169 mg/m³)	0.044 (0.083 mg/m³)	0.019	0.025	0.026 (0.068 mg/m³)
Avg	0.029 (0.033 mg/m³)	0.034 (0.064 mg/m³)	0.009	0.012	0.005 (0.013 mg/m³)
Min	0.000 (0.000 mg/m³)	0.015 (0.028 mg/m³)	0.002	0.001	0.000 (0.000 mg/m³)

Date	Time	CO	NO_2	$PM_{2.5}$	PM_{10}	SO_2
		ppm	ppm	mg/m^3	mg/m^3	ppm
		Hourly	Hourly	Hourly	Hourly	Hourly
06 Jul, 2017	10:00 ~ 10:59	0.002	0.019	0.012	0.006	0.035
06 Jul, 2017	11:00 ~ 11:59	0.000	0.026	0.033	0.013	0.011
06 Jul, 2017	12:00 ~ 12:59	0.000	0.025	0.002	0.001	0.023
06 Jul, 2017	13:00 ~ 13:59	0.000	0.027	0.007	0.007	0.036
06 Jul, 2017	14:00 ~ 14:59	0.000	0.037	0.037	0.027	0.001
06 Jul, 2017	15:00 ~ 15:59	0.009	0.039	0.026	0.014	0.002
06 Jul, 2017	16:00 ~ 16:59	0.010	0.040	0.020	0.018	0.001
06 Jul, 2017	17:00 ~ 17:59	0.101	0.043	0.020	0.014	0.004
06 Jul, 2017	18:00 ~ 18:59	0.014	0.041	0.007	0.008	0.001
06 Jul, 2017	19:00 ~ 19:59	0.031	0.044	0.007	0.007	0.002
06 Jul, 2017	20:00 ~ 20:59	0.034	0.039	0.006	0.009	0.002
06 Jul, 2017	21:00 ~ 21:59	0.021	0.042	0.003	0.004	0.002
06 Jul, 2017	22:00 ~ 22:59	0.023	0.038	0.006	0.007	0.004
06 Jul, 2017	23:00 ~ 23:59	0.010	0.040	0.006	0.007	0.003
07 Jul, 2017	0:00 ~ 0:59	0.045	0.043	0.004	0.004	0.004
07 Jul, 2017	1:00 ~ 1:59	0.022	0.039	0.007	0.009	0.009
07 Jul, 2017	2:00 ~ 2:59	0.005	0.039	0.010	0.018	0.001
07 Jul, 2017	3:00 ~ 3:59	0.025	0.039	0.007	0.006	0.000
07 Jul, 2017	4:00 ~ 4:59	0.014	0.037	0.011	0.014	0.005
07 Jul, 2017	5:00 ~ 5:59	0.071	0.037	0.011	0.011	0.003
07 Jul, 2017	6:00 ~ 6:59	0.040	0.034	0.008	0.015	0.009
07 Jul, 2017	7:00 ~ 7:59	0.007	0.032	0.008	0.017	0.003
07 Jul, 2017	8:00 ~ 8:59	0.031	0.032	0.008	0.014	0.003
07 Jul, 2017	9:00 ~ 9:59	0.003	0.026	0.003	0.003	0.004

Max	0.101 (0.116 mg/m^3)	0.044 (0.083 mg/m^3)	0.037	0.027	0.036 (0.094 mg/m^3)
Avg	0.022 (0.025 mg/m^3)	0.036 (0.068 mg/m^3)	0.011	0.010	0.007 (0.018 mg/m^3)
Min	0.000 (0.000 mg/m^3)	0.019 (0.036 mg/m^3)	0.002	0.001	0.000 (0.000 mg/m^3)

Date	Time	CO	NO_2	$PM_{2.5}$	PM_{10}	SO_2
		ppm	ppm	mg/m^3	mg/m^3	ppm
		Hourly	Hourly	Hourly	Hourly	Hourly
07 Jul, 2017	10:00 ~ 10:59	0.018	0.022	0.003	0.002	0.008
07 Jul, 2017	11:00 ~ 11:59	0.000	0.037	0.014	0.005	0.019
07 Jul, 2017	12:00 ~ 12:59	0.000	0.034	0.003	0.002	0.016
07 Jul, 2017	13:00 ~ 13:59	0.000	0.025	0.002	0.001	0.013
07 Jul, 2017	14:00 ~ 14:59	0.004	0.027	0.002	0.001	0.015
07 Jul, 2017	15:00 ~ 15:59	0.004	0.029	0.003	0.006	0.012
07 Jul, 2017	16:00 ~ 16:59	0.008	0.031	0.025	0.020	0.005
07 Jul, 2017	17:00 ~ 17:59	0.044	0.039	0.027	0.022	0.002
07 Jul, 2017	18:00 ~ 18:59	0.033	0.039	0.020	0.017	0.001
07 Jul, 2017	19:00 ~ 19:59	0.112	0.036	0.018	0.013	0.007
07 Jul, 2017	20:00 ~ 20:59	0.038	0.040	0.009	0.006	0.000
07 Jul, 2017	21:00 ~ 21:59	0.026	0.043	0.006	0.005	0.001
07 Jul, 2017	22:00 ~ 22:59	0.016	0.038	0.007	0.012	0.004
07 Jul, 2017	23:00 ~ 23:59	0.016	0.041	0.009	0.014	0.004
08 Jul, 2017	0:00 ~ 0:59	0.017	0.038	0.009	0.013	0.005
08 Jul, 2017	1:00 ~ 1:59	0.020	0.037	0.008	0.012	0.002
08 Jul, 2017	2:00 ~ 2:59	0.027	0.041	0.008	0.012	0.002
08 Jul, 2017	3:00 ~ 3:59	0.015	0.041	0.010	0.011	0.002
08 Jul, 2017	4:00 ~ 4:59	0.019	0.041	0.008	0.010	0.005
08 Jul, 2017	5:00 ~ 5:59	0.048	0.036	0.012	0.018	0.004
08 Jul, 2017	6:00 ~ 6:59	0.091	0.039	0.011	0.012	0.007
08 Jul, 2017	7:00 ~ 7:59	0.026	0.031	0.007	0.013	0.005
08 Jul, 2017	8:00 ~ 8:59	0.010	0.033	0.012	0.012	0.009
08 Jul, 2017	9:00 ~ 9:59	0.053	0.026	0.004	0.002	0.007

Max	0.112 (0.128 mg/m^3)	0.043 (0.081 mg/m^3)	0.027	0.022	0.019 (0.050 mg/m^3)
Avg	0.027 (0.031 mg/m^3)	0.035 (0.066 mg/m^3)	0.010	0.010	0.006 (0.016 mg/m^3)
Min	0.000 (0.000 mg/m^3)	0.022 (0.041 mg/m^3)	0.002	0.001	0.000 (0.000 mg/m^3)

Date	Time	CO	NO_2	$PM_{2.5}$	PM_{10}	SO_2
		ppm	ppm	mg/m^3	mg/m^3	ppm
		Hourly	Hourly	Hourly	Hourly	Hourly
08 Jul, 2017	10:00 ~ 10:59	0.000	0.021	0.004	0.002	0.021
08 Jul, 2017	11:00 ~ 11:59	0.000	0.033	0.013	0.010	0.021
08 Jul, 2017	12:00 ~ 12:59	0.000	0.034	0.013	0.003	0.003
08 Jul, 2017	13:00 ~ 13:59	0.000	0.022	0.004	0.001	0.022
08 Jul, 2017	14:00 ~ 14:59	0.000	0.031	0.002	0.001	0.015
08 Jul, 2017	15:00 ~ 15:59	0.000	0.032	0.021	0.017	0.012
08 Jul, 2017	16:00 ~ 16:59	0.000	0.039	0.040	0.026	0.001
08 Jul, 2017	17:00 ~ 17:59	0.036	0.039	0.026	0.022	0.000
08 Jul, 2017	18:00 ~ 18:59	0.076	0.038	0.016	0.015	0.002
08 Jul, 2017	19:00 ~ 19:59	0.072	0.041	0.012	0.007	0.006
08 Jul, 2017	20:00 ~ 20:59	0.036	0.042	0.007	0.003	0.005
08 Jul, 2017	21:00 ~ 21:59	0.020	0.044	0.006	0.007	0.004
08 Jul, 2017	22:00 ~ 22:59	0.015	0.044	0.007	0.007	0.002
08 Jul, 2017	23:00 ~ 23:59	0.027	0.040	0.005	0.009	0.000
09 Jul, 2017	0:00 ~ 0:59	0.032	0.039	0.003	0.007	0.002
09 Jul, 2017	1:00 ~ 1:59	0.005	0.041	0.004	0.011	0.005
09 Jul, 2017	2:00 ~ 2:59	0.021	0.044	0.007	0.013	0.002
09 Jul, 2017	3:00 ~ 3:59	0.031	0.040	0.007	0.016	0.005
09 Jul, 2017	4:00 ~ 4:59	0.035	0.037	0.009	0.018	0.008
09 Jul, 2017	5:00 ~ 5:59	0.031	0.039	0.010	0.014	0.008
09 Jul, 2017	6:00 ~ 6:59	0.020	0.040	0.012	0.017	0.003
09 Jul, 2017	7:00 ~ 7:59	0.047	0.042	0.003	0.004	0.003
09 Jul, 2017	8:00 ~ 8:59	0.048	0.032	0.002	0.006	0.010
09 Jul, 2017	9:00 ~ 9:59	0.000	0.018	0.005	0.005	0.003

Max	0.076 (0.087 mg/m^3)	0.044 (0.083 mg/m^3)	0.040	0.026	0.022 (0.058 mg/m^3)
Avg	0.023 (0.026 mg/m^3)	0.036 (0.068 mg/m^3)	0.010	0.010	0.007 (0.018 mg/m^3)
Min	0.000 (0.000 mg/m^3)	0.018 (0.034 mg/m^3)	0.002	0.001	0.000 (0.000 mg/m^3)

Date	Time	CO	NO_2	$PM_{2.5}$	PM_{10}	SO_2
		ppm	ppm	mg/m³	mg/m³	ppm
		Hourly	Hourly	Hourly	Hourly	Hourly
09 Jul, 2017	10:00 ~ 10:59	0.000	0.022	0.006	0.005	0.009
09 Jul, 2017	11:00 ~ 11:59	0.001	0.029	0.002	0.001	0.017
09 Jul, 2017	12:00 ~ 12:59	0.000	0.032	0.007	0.007	0.007
09 Jul, 2017	13:00 ~ 13:59	0.001	0.032	0.002	0.001	0.003
09 Jul, 2017	14:00 ~ 14:59	0.001	0.027	0.005	0.009	0.008
09 Jul, 2017	15:00 ~ 15:59	0.000	0.031	0.017	0.018	0.004
09 Jul, 2017	16:00 ~ 16:59	0.033	0.047	0.024	0.017	0.005
09 Jul, 2017	17:00 ~ 17:59	0.069	0.042	0.011	0.009	0.002
09 Jul, 2017	18:00 ~ 18:59	0.099	0.041	0.004	0.008	0.006
09 Jul, 2017	19:00 ~ 19:59	0.083	0.039	0.007	0.011	0.006
09 Jul, 2017	20:00 ~ 20:59	0.001	0.038	0.009	0.012	0.005
09 Jul, 2017	21:00 ~ 21:59	0.001	0.037	0.009	0.013	0.005
09 Jul, 2017	22:00 ~ 22:59	0.006	0.041	0.008	0.012	0.009
09 Jul, 2017	23:00 ~ 23:59	0.000	0.040	0.004	0.014	0.011
10 Jul, 2017	0:00 ~ 0:59	0.002	0.044	0.008	0.018	0.006
10 Jul, 2017	1:00 ~ 1:59	0.006	0.041	0.007	0.014	0.005
10 Jul, 2017	2:00 ~ 2:59	0.015	0.044	0.011	0.022	0.005
10 Jul, 2017	3:00 ~ 3:59	0.006	0.037	0.007	0.018	0.018
10 Jul, 2017	4:00 ~ 4:59	0.020	0.039	0.020	0.036	0.003
10 Jul, 2017	5:00 ~ 5:59	0.028	0.038	0.024	0.047	0.008
10 Jul, 2017	6:00 ~ 6:59	0.075	0.040	0.010	0.025	0.008
10 Jul, 2017	7:00 ~ 7:59	0.156	0.042	0.008	0.016	0.010
10 Jul, 2017	8:00 ~ 8:59	0.128	0.040	0.010	0.017	0.012
10 Jul, 2017	9:00 ~ 9:59	0.052	0.036	0.016	0.028	0.006

Max	0.156 (0.179 mg/m³)	0.047 (0.088 mg/m³)	0.024	0.047	0.018 (0.047 mg/m³)
Avg	0.033 (0.038 mg/m³)	0.037 (0.070 mg/m³)	0.010	0.016	0.007 (0.018 mg/m³)
Min	0.000 (0.000 mg/m³)	0.022 (0.041 mg/m³)	0.002	0.001	0.002 (0.005 mg/m³)

Thilawa Special Economic Zone (Zone B)
Development Project –Phase 1

Appendix

Noise and Vibration Monitoring Report

June 2017

NOISE AND VIBRATION

MONITORING REPORT

FOR DEVELOPMENT OF INDUSTRIAL AREA

THILAWA SEZ ZONE B

(PHASE 1 CONSTRUCTION STAGE)

(QUARTERLY MONITORING)

June 2017

Myanmar Koei International Ltd.

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CHAPTER 1: OUTLINES AND SUMMARY OF MONITORING PLAN

1.1 General

Thilawa Special Economic Zone (TSEZ) is located in southern district of Yangon region and about 23 km southeast of Yangon city. As the developer of Thilawa SEZ, Myanmar Japan Thilawa Development Ltd. (MJTD) has a responsibility to carry out regular environmental monitoring in the industrial area of Zone B in accordance with the approved Environmental Impact Assessment (EIA) report with Environmental Management Plan (EMP). MJTD has implemented monitoring various environmental items with the specified time frame to know the environmental conditions in and around the area.

1.2 Outlines of Monitoring Plan

To assess the environmental condition under the construction of industrial area in and around Thilawa SEZ Zone B, noise and vibration levels had been monitored from 20th June 2017 – 23rd June 2017 as follows;

Table 1.2-1 Outlines of Noise and Vibration Level Monitoring

Monitoring Date	Monitoring Item	Parameters	Number of Points	Duration	Monitoring Methodology
From 20th June–21st June, 2017	Noise Level	L_{Aeq}(dB)	1 (NV2)	24 hours	On-site measurement by "Rion NL-42 sound level meter"
From 22nd June–23rd June, 2017	Noise Level	L_{Aeq}(dB)	1 (NV1)	24 hours	On-site measurement by "Rion NL-42 sound level meter"
From 20th June–21st June, 2017	Vibration Level	L_{v10} (dB)	1 (NV2)	24 hours	On-site measurement by "Vibration Level Meter- VM-53A"
From 22nd June–23rd June, 2017	Vibration Level	L_{v10} (dB)	1 (NV1)	24 hours	On-site measurement by "Vibration Level Meter- VM-53A"

CHAPTER 2: NOISE AND VIBRATION LEVEL MONITORING

2.1 Monitoring Item

The noise and vibration level monitoring items are shown in Table 2.1-1.

Table 2.1-1 Monitoring Parameters for Noise and Vibration Level

No.	Item	Parameter
1	Noise	A-weighted loudness equivalent (L_{Aeq})
2	Vibration	Vibration level, vertical, percentile (L_{V10})

2.2 Monitoring Location

Noise and vibration levels were measured at the northeast corner of the Thilawa SEZ Zone B, monitoring point (NV-1); N: 16°40'17.90", E: 96°17'18.20" for traffic noise concerned and at the south of the Thilawa SEZ Zone B, sampling point (NV-2); N: 16°39'24.90", E: 96°17'16.70", inside the monastery compound of Phalan village. The location of the noise and vibration monitoring points are shown in Figure 2.2-1.

Figure 2.2-1 Location of Noise and Vibration Level Monitoring Points

NV-1

NV-1 is located in front of temporary gate of construction site of Thilawa SEZ Zone B and next to Thilawa Development road. The surrounding area are Zone A in the northwest, local industrial zone in the east and paddy field in the west respectively. Possible sources of noise and vibration is generated from construction activities and road traffic.

NV-2

NV-2 is located at the south of the Thilawa SEZ Zone B, inside the monastery compound of Phalan village, surrounded by the residential houses of Phalan village in the south and fields in west, Thilawa SEZ Zone A in north, local industrial zone in northeast respectively. Possible sources of noise and vibration is generated from construction activities from Zone B and daily human activities from nearby Phalan village.

2.3 Monitoring Method

Noise level was measured by "Rion NL-42 sound level meter" and automatically recorded every 10 minutes in a memory card. The vibration level meter was, VM-53A (Rion Co. Ltd., Japan), accompanied by a 3-axis accelerometer PV-83C (Rion Co. Ltd.) was placed on solid soil ground. Vertical vibration (Z axis), L_v, was measured every 10 minutes within the adaptable range of (10-70) dB at NV-1 and (10-70) dB at NV-2 and recorded to a memory card.
The measurement period of noise and vibration was 24 hours for each monitoring point. The status of the noise and vibration level monitoring on NV-1 and NV-2 are shown in Figure 2.3-1.

Figure 2.3-1 Status of Noise and Vibration Level Monitoring at NV-1 and NV-2

2.4 Monitoring Results

Noise Monitoring Results

Noise monitoring results are separated daytime (6:00 AM to 10:00 PM), evening time (10:00 PM to 6:00 AM) time frames for NV-1 and daytime (7:00 AM to 7:00 PM), evening time (7:00 PM to 10:00 PM), and night time (10:00 PM to 7:00 AM) time frames respectively for NV-2. Noise measurement was carried out for one location on a 24-hour basis. The monitoring results are summarized in Table 2.4-1 and Table 2.4-2. Comparing with the target value of noise level in construction stage prescribed in EIA report for Thilawa SEZ development project Zone B, all results were under the target values at NV-1 but noise level at NV-2 in the evening time (7:00 PM – 10:00 PM) is exceeded than the target value. There were no construction activities in Zone B in evening and night time (from 18:00 to 7:00). In addition, the noise sources other than the sound from loudspeakers in surrounding village were not confirmed. Therefore, the result in evening time at NV-2 was exceeded the target value due to sound from loudspeaker in surrounding village.

Table 2.4-1 Results of Noise Levels (L_{Aeq}) Monitoring at NV-1

Date	(Traffic Noise Level) Equivalent Noise Level (L_{Aeq} dB)	
	Day Time (6:00 AM – 10:00 PM)	Night Time (10:00 PM – 6:00 AM)
22nd June – 23rd June, 2017	62	53
Target Value	75	70

Note: Target value is applied to the noise standard along main road stipulated in the Noise Regulation Law (Japan) (Law No. 98 of 1968, Latest Amendment by Law No.91 of 2000).

Table 2.4-2 Results of Noise Levels (L_{Aeq}) Monitoring at NV-2

Date	(Residential area & monastery located less than 150m from the construction site) Equivalent Noise Level (L_{Aeq} dB)		
	Day Time (7:00 AM – 7:00 PM)	Evening Time (7:00 PM – 10:00 PM)	Night Time (10:00 PM – 7:00 AM)
20th June – 21st June, 2017	53	65*	52
Target Value	75	60	55

Note: Target value is applied to the noise level during the construction stage in the EIA Report for Thilawa SEZ Development Project (Industrial Area of Zone B).
Note: * The result of time frame (19:00-23:00) had been affected sound from loudspeakers from surrounding village.

Table 2.4-3 Hourly Noise Level (L_{Aeq}) Monitoring Results at NV-1

Date	Time	(L_{Aeq}, dB)	(L_{Aeq}, dB) Each Category	(L_{Aeq}, dB) Target Value	Remark
22nd June – 23rd June, 2017	6:00-7:00	61	62	75	No Construction Activity
	7:00-8:00	60			
	8:00-9:00	58			Construction Activity: Soft soil removing and good soil filling, slope repairing, crashing stone leveling, excavation
	9:00-10:00	65			
	10:00-11:00	62			
	11:00-12:00	64			
	12:00-13:00	61			No Construction Activity
	13:00-14:00	66			Construction Activity: Soft soil removing and good soil filling, concrete carrying, crashing stone leveling
	14:00-15:00	62			
	15:00-16:00	62			
	16:00-17:00	64			
	17:00-18:00	62			
	18:00-19:00	61			No Construction Activity
	19:00-20:00	59			
	20:00-21:00	56			
	21:00-22:00	55			
	22:00-23:00	55	53	70	
	23:00-24:00	55			
	24:00-1:00	51			
	1:00-2:00	51			
	2:00-3:00	50			
	3:00-4:00	47			
	4:00-5:00	48			
	5:00-6:00	56			

Table 2.4-4 Hourly Noise Level (L_{Aeq}) Monitoring Results at NV-2

Date	Time	(L_{Aeq}, dB)	(L_{Aeq}, dB) Each Category	(L_{Aeq}, dB) Target Value	Remark
20th June – 21st June, 2017	7:00-8:00	49	53	75	No Construction Activity
	8:00-9:00	52			Construction Activity: Soft soil removing and good soil filling, leveling
	9:00-10:00	51			
	10:00-11:00	50			
	11:00-12:00	49			
	12:00-13:00	50			No Construction Activity
	13:00-14:00	61			Construction Activity: Soft soil removing and good soil filling
	14:00-15:00	50			
	15:00-16:00	50			
	16:00-17:00	51			
	17:00-18:00	53			
	18:00-19:00	53			
	19:00-20:00	62	65	60	-No Construction Activity -Sound from the villages
	20:00-21:00	66			
	21:00-22:00	65			
	22:00-23:00	60	52	55	
	23:00-24:00	51			No Construction Activity
	24:00-1:00	45			
	1:00-2:00	44			
	2:00-3:00	44			
	3:00-4:00	50			
	4:00-5:00	47			
	5:00-6:00	51			
	6:00-7:00	49			

Figure 2.4-1 Results of Noise Levels (LA_{eq}) Monitoring at NV-1

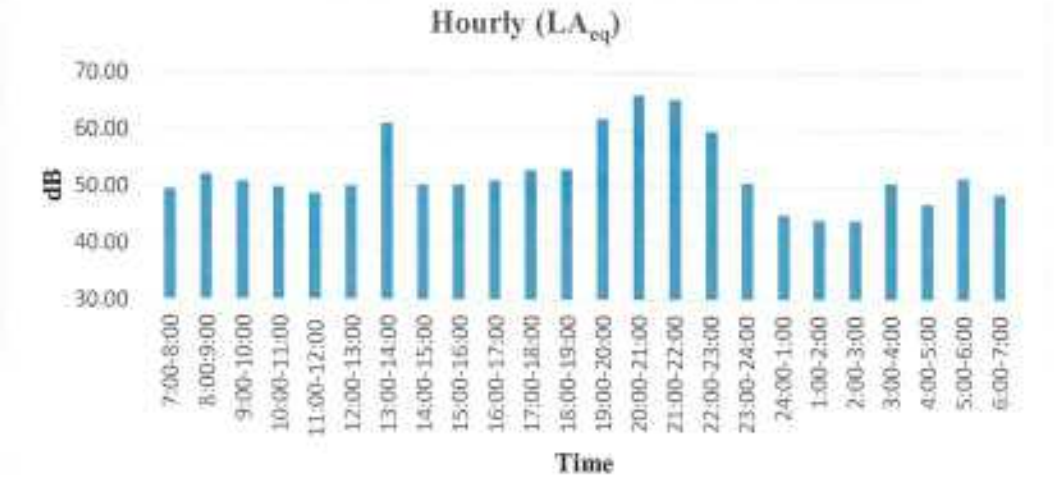

Figure 2.4-2 Results of Noise Levels (LA_{eq}) Monitoring at NV-2

Vibration Monitoring Results

The results of vibration level are shown in Table 2.4-5 and Table 2.4-6. By comparing with the target vibration level in construction stage in EIA report for Thilawa SEZ development project Zone B, all of results were under the target values.

Table 2.4-5 Results of Vibration Levels (L_{v10}) Monitoring at NV-1

Location	Date	(Residential and commercial and industrial areas) Equivalent Vibration Level (L_{v10}, dB)		
		Day Time (7:00 AM – 7:00 PM)	Evening Time (7:00 PM – 10:00 PM)	Night Time (10:00 PM – 7:00 AM)
NV-1	22nd – 23rd June, 2017	40	36	33
Target Value		70	70	65

Note: Target value is applied to the noise level during the construction stage in the EIA Report for Thilawa SEZ Development Project (Industrial Area of Zone B).

Table 2.4-6 Results of Vibration Levels (L_{v10}) Monitoring at NV-2

Location	Date	(Monastery and residential area) Equivalent Vibration Level (L_{v10}, dB)		
		Day Time (7:00 AM – 7:00 PM)	Evening Time (7:00 PM – 10:00 PM)	Night Time (10:00 PM – 7:00 AM)
NV-2	20th – 21st June, 2017	44	41	17
Target Value		65	65	60

Note: Target value is applied to the noise level during the construction stage in the EIA Report for Thilawa SEZ Development Project (Industrial Area of Zone B).

Table 2.4-7 Results of Hourly Vibration Levels (L_{v10}) Monitoring at NV-1

Date	22nd – 23rd Jun 2017	(L_{v10},dB) (NV-1) Each Category	(L_{v10},dB) Target Value	Remark
Time	L_{v10}(NV-1)			
7:00-8:00	36	40	70	No construction activity
8:00-9:00	37			Construction Activity: -Soft soil removing and good soil filling, slope repairing, crashing stone leveling, excavation at near NV-1.
9:00-10:00	42			
10:00-11:00	41			
11:00-12:00	41			
12:00-13:00	38			No construction activity
13:00-14:00	43			Construction Activity: -Soft soil removing and good soil filling, concrete carrying, crashing stone leveling at near NV-1.
14:00-15:00	41			
15:00-16:00	42			
16:00-17:00	41			
17:00-18:00	41			
18:00-19:00	38			No construction activity
19:00-20:00	39	36	70	
20:00-21:00	36			
21:00-22:00	34			
22:00-23:00	34	33	65	
23:00-24:00	35			
24:00-1:00	28			
1:00-2:00	27			
2:00-3:00	32			
3:00-4:00	22			
4:00-5:00	23			
5:00-6:00	33			
6:00-7:00	37			

Table 2.4-8 Results of Hourly Vibration Levels (L_{v10}) Monitoring at NV-2

Date	20th – 21st Jun 2017	(L_{v10}, dB) (NV-2) Each Category	(L_{v10}, dB) Target Value	Remark
Time	L_{v10} (NV-2)			
7:00-8:00	15	44	65	No construction activity
8:00-9:00	23			Construction Activity: -Soft soil removing and good soil filling, leveling at near NV-2.
9:00-10:00	21			
10:00-11:00	41			
11:00-12:00	47			
12:00-13:00	51			No construction activity
13:00-14:00	37			Construction Activity: -Soft soil removing and good soil filling at near NV-2.
14:00-15:00	23			
15:00-16:00	37			
16:00-17:00	45			
17:00-18:00	45			
18:00-19:00	47			No construction activity
19:00-20:00	43	41	65	
20:00-21:00	39			
21:00-22:00	40			
22:00-23:00	19	17	60	
23:00-24:00	19			
24:00-1:00	16			
1:00-2:00	19			
2:00-3:00	15			
3:00-4:00	14			
4:00-5:00	15			
5:00-6:00	14			
6:00-7:00	13			

Figure 2.4-3 Results of Vibration Levels (L_{v10}) Monitoring at NV-1

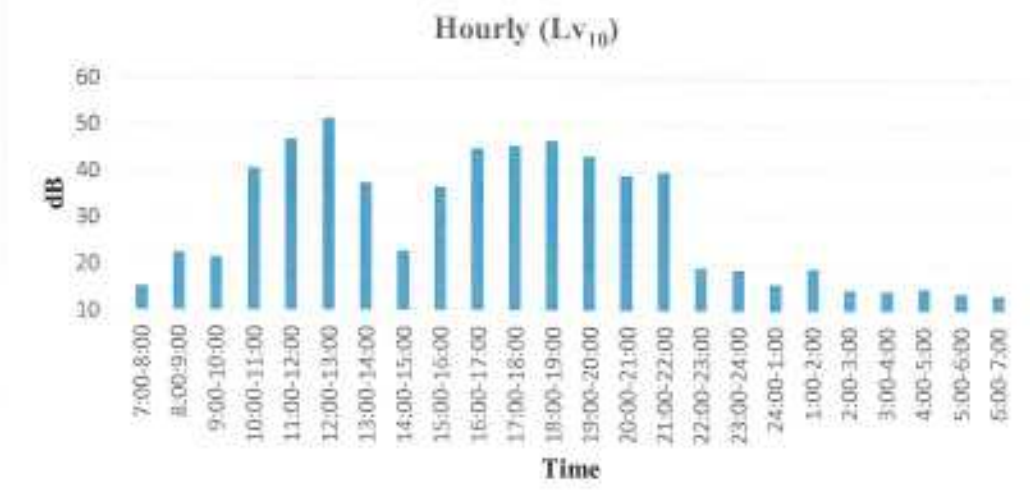

Figure 2.4-4 Results of Vibration Levels (L_{v10}) Monitoring at NV-2

CHAPTER 3: CONCLUSION AND ISSUES TO BE SOLVED

By comparing with the target noise and vibration level in construction stage in EIA report for Thilawa SEZ development project Zone B, all results were under the target values at NV-1. There were no construction activities in Zone B in evening and night time (from 18:00 to 7:00). In addition, the noise sources other than the sound from loudspeakers in surrounding village were not confirmed. Therefore, the result in evening time at NV-2 was exceeded the target value due to sound from loudspeaker in surrounding village. The results of vibration level for NV-1 is approximately half of the target levels and NV-2 is under target value. Thus, there is no negative impact on noise and vibration from construction activities of Zone B to the surrounding environment.

In conclusion of this environmental monitoring, there are no specific noise and vibration impacts to the surrounding area of industrial area of Thilawa SEZ Zone B during the monitoring period.

Thilawa Special Economic Zone (Zone B)
Development Project –Phase 1

Appendix

Traffic Volume Monitoring Report

June 2017

TRAFFIC VOLUME MONITORING REPORT

FOR DEVELOPMENT OF INDUSTRIAL AREA

THILAWA SEZ ZONE B

(PHASE 1 CONSTRUCTION STAGE)

(QUARTERLY MONITORING)

June 2017

Myanmar Koei International Ltd.

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CHAPTER 1: OUTLINES AND SUMMARY OF MONITORING PLAN

1.1 General

Thilawa Special Economic Zone (TSEZ) is located in southern district of Yangon region and about 23 km southeast of Yangon city. As the developer of Thilawa SEZ, Myanmar Japan Thilawa Development Ltd. (MJTD) has a responsibility to carry out regular environmental monitoring in the industrial area of Zone B in accordance with the approved Environmental Impact Assessment (EIA) report with Environmental Management Plan (EMP). MJTD has implemented monitoring various environmental items with the specified time frame to know the environmental conditions in and around the area.

1.2 Outlines of Monitoring Plan

To assess the environmental condition under the construction of industrial area in and around Thilawa SEZ Zone B, Traffic volume had been monitored from 22nd June 2017 – 23rd June 2017 as follows;

Table 1.2-1 Outlines of Traffic Volume Monitoring

Monitoring Date	Monitoring Item	Parameters	Number of Point	Duration	Monitoring Methodology
From 22nd June–23rd June, 2017	Traffic Volume	-	1 (TV-1)	24 hours	Manual Count

CHAPTER 2: TRAFFIC VOLUME MONITORING

2.1 Monitoring Item

The traffic volume monitoring item are shown in Table 2.1-1. All vehicles were classified into four types as detailed in Table 2.1-2.

Table 2.1-1 Monitoring Parameters for Traffic Volume

No.	Item	Parameter
1	Traffic volume	Number of Vehicle (4 Types)

Table 2.1-2 Classification of Vehicles Types

No.	Classification		Description
1	Two-wheeled vehicle		Motorbike, Motorcycle taxi
2	Four-wheeled light vehicle		Pick-up car, Jeep, Taxi, Saloon car, Light truck (under 2 tons)
3	Four-wheeled heavy vehicle		Medium bus, Express, Big bus, Medium truck, Heavy truck
4	Others		Tractor

2.2 Monitoring Location

Traffic volume was measured at the northeast corner of the Thilawa SEZ Zone B, monitoring point (TV-1); N: 16°40'17.90", E: 96°17'18.20". The location of the traffic volume monitoring point is shown in Figure 2.2-1.

Figure 2.2-1 Location of Traffic Volume Monitoring Point

TV-1

TV-1 is located in front of main gate of construction site of Thilawa SEZ Zone B and next to Thilawa Development road. The surrounding area are Zone A in the northwest, local industrial zone in the east and paddy field in the west respectively.

2.3 Monitoring Method

The traffic volume monitoring was conducted for 24 hours at the same time as the traffic noise and vibration level monitoring. Traffic volume monitoring was conducted to count the numbers of vehicles moving in each direction. Manual count method is used and data are recorded using tally sheets. The status of the traffic volume monitoring on TV-1 is shown in Figure 2.3-1.

Figure 2.3-1 Status of Traffic Volume Monitoring at TV-1

2.4 Monitoring Results

The traffic volume monitoring results are summarized in Table 2.4-1. Hourly quantities of each type of vehicle were recorded. The table 2.4-1 shows that the number of 2-wheel vehicles are distinctly higher utilized in weekdays. The number of 4-wheel heavy vehicles are slightly lower than the number of 4-wheel light vehicles for each direction.

Table 2.4-1 Summary of Traffic Volume Recorded at TV-1

Survey Point	Direction	Date	Weekday	2-wheel Vehicles	4-wheel Light Vehicles	4-wheel Heavy Vehicles	Others	Total
TV-1	Phalan village to Dagon-Thilawa road	22nd June-23rd June 2017	Thursday & Friday	1,402	528	352	47	2329
	Dagon-Thilawa road to Phalan village			1,291	542	357	43	2233

The summary monitoring results of hourly traffic volume at TV-1 is shown in Table 2.4-2 and Table 2.4-3, respectively. Compare the result of each direction in morning peak hours as 6:30 to 9:30 and in the evening peak hours as 16:30 to 18:30, traffic volume from Phalan village to Dagon-Thilawa road is higher than another direction in the morning peak hours. In the evening peak hours, traffic volume from Dagon-Thilawa road to Phalan village is higher than another direction. It may be possible commuting vehicles are passing from Phalan village to Dagon-Thilawa road in the morning peak hours and returning from Dagon-Thilawa road to Phalan village in the evening peak hours in this monitoring period.

Table 2.4-2 Hourly Traffic Volume Results at TV-1 (From Phalan Village to Dagon-Thilawa Road)

From	To	Classification				Total
		Type of vehicles				
		Two-wheeled vehicle	Four-wheeled light vehicle	Four-wheeled heavy vehicle	Others	
9:30	10:30	67	27	29	5	128
10:30	11:30	84	32	32	6	154
11:30	12:30	54	32	31	3	120
12:30	13:30	64	47	16	3	130
13:30	14:30	59	46	23	1	129
14:30	15:30	65	32	26	6	129
15:30	16:30	54	36	33	2	125
16:30	17:30	87	43	26	6	162
17:30	18:30	111	52	34	2	199
18:30	19:30	50	25	13	1	89
19:30	20:30	37	19	15	1	72
20:30	21:30	8	9	8	0	25
21:30	22:30	7	9	10	0	26
22:30	23:30	0	0	3	0	3
23:30	00:30	8	1	1	0	10
00:30	1:30	2	2	10	0	14
1:30	2:30	0	2	0	0	2
2:30	3:30	1	3	0	0	4
3:30	4:30	3	0	0	0	3
4:30	5:30	6	4	0	0	10
5:30	6:30	40	19	4	0	63
6:30	7:30	295	34	13	6	348
7:30	8:30	209	29	11	4	253
8:30	9:30	91	25	14	1	131
Total		1402	528	352	47	2329

Table 2.4-3 Hourly Traffic Volume Results at TV-1 (From Dagon-Thilawa Road to Phalan Village)

From	To	Classification				Total
		Type of vehicles				
		Two-wheeled vehicle	Four-wheeled light vehicle	Four-wheeled heavy vehicle	Others	
9:30	10:30	64	30	18	2	114
10:30	11:30	62	41	32	3	138
11:30	12:30	70	44	35	4	153
12:30	13:30	58	47	8	3	116
13:30	14:30	73	34	26	2	135
14:30	15:30	50	41	18	2	111
15:30	16:30	54	25	34	3	116
16:30	17:30	170	38	30	7	245
17:30	18:30	170	43	32	6	251
18:30	19:30	60	21	10	0	91
19:30	20:30	49	17	17	0	83
20:30	21:30	17	10	4	0	31
21:30	22:30	21	13	12	1	47
22:30	23:30	8	7	9	0	24
23:30	00:30	6	6	8	1	21
00:30	1:30	2	7	7	0	16
1:30	2:30	1	3	4	0	8
2:30	3:30	2	2	8	0	12
3:30	4:30	5	1	0	0	6
4:30	5:30	5	2	1	0	8
5:30	6:30	32	8	5	0	45
6:30	7:30	128	29	13	5	175
7:30	8:30	112	45	7	3	167
8:30	9:30	72	28	19	1	120
Total		1291	542	357	43	2233

CHAPTER 3: CONCLUSION AND ISSUES TO BE SOLVED

The results of the traffic volume show that the number of 2-wheel vehicles are distinctly higher utilized in this monitoring period. The number of 4-wheel heavy vehicles are slightly lower than the number of 4-wheel light vehicles for each direction. It seems that commuting vehicles are much utilized during this monitoring period as compare with construction related vehicles (4-wheel heavy vehicles).

The continuous monitoring will be necessary to grasp the traffic volume data in construction stage of Thilawa SEZ Zone B. Once enough traffic volume data will be collected, the mitigation measures for traffic volume management will be considered in future.

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