MJTD

Thilawa Special Economic Zone (Zone A) Development

Environmental Monitoring Report (Operation Phase)

Myanmar Japan Thilawa Development Limited.

October 2019

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 with oversight by Thilawa SEZ Management Committee.

The monitoring record from April 2019 to September 2019 according to the Environment Monitoring Plan is submitted in conformity with the provision of Chapter 9.1, Table 9.1-2 and 9.2, Table 9.2-2 Content of the EIA Report of Thilawa SEZ Development Project (Zone A).

2. Summary of Monitoring Activities

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

We already submitted EMP for TSEZ Zone-A as following table.

Report No.	Description	Phase	Submission
1	Environmental Monitoring Report	Phase-1 Operation Phase	April, 2016
2	Environmental Monitoring Report	Phase-1 Operation Phase	October, 2016
3	Environmental Monitoring Report	Phase-1 & 2 Operation Phase	April, 2017
4	Environmental Monitoring Report	Phase-1 & 2 Operation Phase	October, 2017
5	Environmental Monitoring Report	Phase-1 & 2 Operation Phase	April, 2018
6	Environmental Monitoring Report	Phase-1 & 2 Operation Phase	October, 2018
7	Environmental Monitoring Report	Phase-1 & 2 Operation Phase	April, 2019
8	Environmental Monitoring Report	Phase-1 & 2 Operation Phase	October, 2019

Report (No.8) is submitted this day attached with Operation Phase implementation schedule. Subsequent Operation Phase reports will be submitted on Bi-Annually.

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

Required clear guideline for the reference and target standard of water (such as surface water, wastewater, ground water etc.) in order to report TSEZ discharging impact.

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:

There were eight cases of accidents happened during monitoring period at Thilawa SEZ common area. Each tenant's accidents will report directly to Environmental Section, One Stop Service Center, Thilawa SEZ Management Committee.

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

Please refer to the attached Environmental Monitoring Form.

3. Monitoring Result

Environmental Monitoring plan report for Operation Phase implemented according to the following table, reference on Table 4.2-2, Chapter 4, EIA Report

Monitoring Plan (Operation Phase)

Category	Item	Location	Frequency	Remark
Air Quality	NO_2, SO_2, CO, TSP, PM_{10}	Representative point inside TSEZ Zone-A area	1 week each in dry and wet season (First 3 years after operation stage)	August 2019, Air quality monitoring report (Bi-Annually)
Water Quality	Water temperature, pH, SS, DO, BOD, COD, T-coliform T-N, T-P, Color and odor, HS, HCN, Oil and grease, Formaldehyde, Phenols, Cresols Free Chlorine, Zinc, Chromium, Arsenic, Copper, Mercury, Cadmium, Barium, Selenium, Lead and Nickel	Discharging points and reference points (6 points) which including outflow of retention pond to the river (1 point) Well in the Monastery (1 point)	Bi-monthly for water, temperature, pH, SS, DO, BOD, COD, T-Coliform, T-N, T-P, Color and odor Bi-annually for all parameters	April 2019 and August 2019, Water and waste water quality monitoring report (Bi-Monthly) June 2019, Water and wastewater quality monitoring report (Bi-Annually)
Waste	Status of non-hazardous waste management Status of hazardous waste management	Each tenant	Twice/ year (Submission of environmental reports by tenants	General waste disposal record (Waste generated from common area of TSEZ and Admin complex)
Noise and Vibration	Noise level at the monastery and residences to check effect of buffer zone for sound proofing to	Each tenant	One time in each dry and wet season (First 3 years after operation stage)	August 2019, Noise and vibration Monitoring Report (Bi-Annually)
Ground Subsidence	Ground elevation Consumption of ground water amount	Representative site (1 point)	Weekly	Refer to Environmental Monitoring form
Offensive Odor	Status offensive odor control by tenants	Each tenant	Twice/ year (Submission of environmental report by tenants)	Refer to Environmental Monitoring form
Bottom Sediment	Combined with water quality monitoring	Same as water quality monitoring	Same as water quality monitoring	Refer to Environmental Monitoring Form
Hydrological situation	Combined with ground subsidence monitoring	Same as ground subsidence monitoring	Same as ground subsidence monitoring	Refer to Environmental Monitoring Form
Risk for infectious disease such as AIDS/HIV	Status of measures of infectious disease	Each tenant	Twice/year (Submission of environmental report by tenants)	Refer to Environmental Monitoring form
Working conditions (including occupational safety)	Prehension of condition of occupational safety and health Prehension of infectious disease	Work site	Twice/year (Submission of environmental report by tenants)	
Accident	Existence of accident	Work site	As occasion arise	-

*Remark: Each locator will report their monitoring result directly to Environmental Section, One Stop Service Center, Thilawa SEZ Management Committee.

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Thilawa Special Economic Zone (Zone A)

Development Project (Operation Phase)

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 (Zone A). 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 (Not Applicable)

Name of permits	Expected issuance date	Actual issuance date	Concerned authority	Remarks (Conditions, etc.)
Confirming report of Environmental Impact Assessment		3rd December 2013	Thilawa SEZ Management Committee	
Notification of the comments of Ministry of Natural Resources and Environmental Conservation regarding with the Standard Change of Wastewater Quality of Industrial Zone, Internal Regulations of Thilawa SEZ Zone-A and Zone-B	5th January 2018	10th January 2018	Thilawa SEZ Management Committee	As Attachment

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3) Response/Actions to Comments and Guidance from Government Authorities and the Public (Not Applicable)

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

(2) Monitoring Results

1) Ambient/ Air Quality – February 2019

NO_2, SO_2, CO, TSP, PM10

Location	Item	Unit	Measured Value (Mean)	Measured Value (Min~Max.)	Country's Standard	Target value to be applied	*Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
Centralized Sewage treatment plant area	NO_2	ppm	0.017	0.000 - 0.066	Refer to NEQG	< 0.06	Japan	1 week each in dry and wet season	HAZSCANNER, EPAS	
	SO_2	ppm	0.019	0.000 – 0.105		< 0.04	Japan		HAZSCANNER, EPAS	
	CO	ppm	0.070	0.002- 0.166		< 10	Japan		HAZSCANNER, EPAS	
	TSP	mg/m³	0.093	0.004 – 0.466		< 0.33	Thailand		HAZSCANNE1R, EPAS	
	PM10	mg/m³	0.034	0.002 -0.170		< 0.12	Thailand		HAZSCANNER, EPAS	

***Remark:** Referred to the Japan and Thailand Standard (EIA Report, Table 6.4-1) and Air Quality Monitoring Report (February 2019)

Complains 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)(a) Water Quality – April 2019

Measuring Point: Effluent of Wastewater (Thilawa SEZ discharging point which need to be monitored according to EIA are SW-1, SW-5 and SW-6. SW-2 and SW-4 natural creek water which are combine all the wastewater from the Local industrial water and domestic water from existing living environment are attach as reference points only. GW-1 is also as reference point for monitoring of existing tube well located in the Monastery compound.)

- 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	Country's Standard*2	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
SW-1	pH	-	8.34	6-9	5.0-9.0	>=4	Once in two months	Instrument Analysis Method	
	SS	ppm	18	50	Max.50			APHA 2540D Method	
	DO	ppm	8.84	-	-			Instrument Analysis Method	
	COD(Cr)	ppm	26.4	250	Max.70			APHA 5220D Method	
	BOD	ppm	7.07	50	Max.20			APHA-5210B Method	
	T-N	ppm	1.9	-	Max.80			HACH Method 10072	
	T-P	ppm	<0.050	2	Max 8			APHA 4500-PE	
	Color	Co.Pt	4.09	-	-			APHA 2120C	

Location	Item	Unit	Measured Value	Country's Standard*2	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
	Odor	Co.Pt	1	-	-			APHA 2150B	
	Total coliforms*3	MPN/100ml	24,000	400	Max.400	7.5×10^3		APHA 9221B	
SW-5	pH	-	8.76	6-9	5.0-9.0	>=4	Once in two months	Instrument Analysis Method	
	SS	ppm	40	50	Max.50			APHA 2540D Method	
	DO	ppm	7.85	-	-			Instrument Analysis Method	
	COD(Cr)	ppm	26	250	Max.70			APHA 5220D Method	
	BOD	ppm	8.16	50	Max.20			APHA-5210B Method	
	T-N	ppm	2.5	-	Max.80			HACH Method 10072	
	T-P	ppm	0.39	2	-			APHA 4500-PE	
	Color	Co.Pt	6.18	-	-			APHA 2120C	
	Odor	Co.Pt	1.4	-	-			APHA 2150B	
	Total coliforms*3	MPN/100ml	160,000	400	Max.400	7.5×10^3		APHA 9221B	
SW-6	pH	-	7.15	6-9	5.0-9.0	>=4	Once in two months	Instrument Analysis Method	
	SS	ppm	4	50	Max.50			APHA 2540D Method	
	DO	ppm	6.65	-	-			Instrument Analysis Method	
	COD(Cr)	ppm	17.8	250	Max.70			APHA 5220D Method	
	BOD	ppm	0.66	50	Max.20			APHA-5210B Method	
	T-N	ppm	17.3	-	Max.80			HACH Method 10072	
	T-P	ppm	0.639	2	-			APHA 4500-PE	
	Color	Co.Pt	4.64	-	-			APHA 2120C	
	Odor	Co.Pt	1.4	-	-	7.5×10^3		APHA 2150B	

Location	Item	Unit	Measured Value	Country's Standard*2	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
	Total coliforms	MPN/100ml	< 1.8	400	Max.400			APHA 9221B	
SW-2 (Reference Point)	pH	-	8.26	6-9	5.0-9.0	>=4	Once in two months	Instrument Analysis Method	
	SS*4	ppm	82	50	Max.50			APHA 2540D Method	
	DO	ppm	6.78	-	-			Instrument Analysis Method	
	COD(Cr)	ppm	70	250	Max.70			APHA 5220D Method	
	BOD	ppm	6.44	50	Max.20			APHA-5210B Method	
	T-N	ppm	4.5	-	Max.80			HACH Method 10072	
	T-P	ppm	< 0.050	2	-			APHA 4500-PE	
	Color	Co.Pt	14.42	-	-			APHA 2120C	
	Odor	Co.Pt	1.4	-	-			APHA 2150B	
	Total coliforms*5	MPN/100ml	> 160,000	400	Max.400			APHA 9221B	
SW-4 (Reference Point)	pH	-	7.73	6-9	5.0-9.0	>=4	Once in two months	Instrument Analysis Method	
	SS*4	ppm	80	50	Max.50			APHA 2540D Method	
	DO	ppm	6.76	-	-			Instrument Analysis Method	
	COD(Cr)	ppm	31.4	250	Max.70			APHA 5220D Method	
	BOD	ppm	4.86	50	Max.20			APHA-5210B Method	
	T-N	ppm	1.7	-	Max.80			HACH Method 10072	
	T-P	ppm	<0.050	2	-			APHA 4500-PE	
	Color	Co.Pt	3.9	-	-			APHA 2120C	
	Odor	Co.Pt	1	-	-			APHA 2150B	
	Total coliforms*5	MPN/100ml	2,100	400	Max.400			APHA 9221B	

Location	Item	Unit	Measured Value	Country's Standard*2	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
GW-1 (Reference Point)	pH	-	8.07	None (Available Guideline value determined by MONREC)	None (Available Guideline Value determined by MOI)	5.5~9.0	Once in two months	Instrument Analysis Method	
	SS	ppm	2			50		APHA 2540D Method	
	DO	ppm	6.49			>=4		Instrument Analysis Method	
	COD(Cr)	ppm	5.4			60		APHA 5220D Method	
	BOD	ppm	2.14			15		APHA-5210B Method	
	T-N	ppm	2.5			0.1		HACH Method 10072	
	T-P	ppm	0.067			0.04		APHA 4500-PE	
	Color	Co.Pt	2.14					APHA 2120C	
	Odor	Co.Pt	1					APHA 2150B	
	Total coliforms	MPN/100ml	79			7.5×10^3		APHA 9221B	

*1Remark: Referred to the Vietnam Standard (EIA Report), Reference to the Water Quality Monitoring Report, April 2019.

*2Remarks: There is no current country standard but Ministry of Natural Recourses and Environmental Conservation submitted the National Emission Quality Guidelines (NEQG) for environmental guidelines. The guidelines filled as the country standards in the environmental monitoring form.

*3Remark: In SW-1 and SW-5, Total coliform are higher than the target value due to the expected reason-i) the potential expected reason might natural bacteria existed in all area of Zone-A because there are various kind of vegetation and creature such as birds, and small animals in and along the retention canals and retention ponds. Total coliform do not affect human health directly, self-monitoring for E.Coli analysis was carried out to identify health impact by coliform bacteria. As for the result of E.Coli for SW1 was 21 & SW5 was 17 and they were under the reference under target value. It is considered that there is no significant impact to human health.

*4 Remark: In SW-2 and SW-4, the results of SS are higher than the target value due to the expected reason i) delivered from upstream area such as natural origin and wastewater from local industrial zone which outside of Thilawa SEZ ii) influence by water from the downstream of monitoring points due to flow back by tidal fluctuation.

*5Remark: For reference monitoring points (SW-2 and SW-4), the result of total coliforms is higher than the standard due to two expected reason: i) runoff of animal waste from the undeveloped area and delivered from local industrial zone and illegal dumping site from outside of Thilawa SEZ in the upstream area ii) delivered from surrounding area

by tidal effect.

2)(b) Water Quality – June 2019

Measuring Point: Effluent of Wastewater

- 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	Country's Standard	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
SW-1	Temperature	°C	30	< 3 (increase)	Max 40		Twice in one year	Instrument Analysis Method	
	pH	-	8.7	6-9	5.0-9.0			Instrument Analysis Method	
	SS*2	mg/l	182	50	Max 50			APHA 2540D Method	
	DO	mg/l	6.67	-	-	>=4		Instrument Analysis Method	
	BOD	mg/l	9.2	50	Max 20			APHA-5210B Method	
	COD(Cr)	mg/l	30.6	250	Max 70*4			APHA 5220D Method	
	Total Coliform*3	MPN/10	11000	400	Max 400	7.5×10^3		APHA-9221B Method	
	T-N	0ml	3.5	-	Max 80			HACH Method 10072	
	T-P	mg/l	0.342	2	-			APHA 4500-P E Method	
	Color	mg/l	2.47	-	Max 150			APHA-2120C Method	
	Odor	Co.Pt	1	-	-			APHA-2150B Method	
	HS	Co Pt		1	Max 1			HACH 8131 Method	
	Oil and Grease	mg/l	< 3.1	10	Max 5			APHA-5520B Method	
	Formaldehyde	mg/l	0.115	-	Max 1			USEPA Method 420.1 Method	

Location	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
	Phenols	mg/l	0.052	0.5	Max 1			APHA 3120B	
	Free Chlorine	mg/l	< 0.1	0.2	Max 1			HACH 8131	
	Zinc	mg/l	≤ 0.002	2	Max 5			APHA-3120B Method	
	Chromium	mg/l	0.02	0.5	Max 0.5			APHA-3120B Method	
	Arsenic	mg/l	0.01	0.1	Max 0.25			APHA-3120B Method	
	Copper	mg/l	0.003	0.5	Max 1			APHA-3120B Method	
	Mercury	mg/l	≤ 0.002	0.01	Max 0.005			APHA-3120B Method	
	Cadmium	mg/l	≤ 0.002	0.1	Max 0.03		Twice in one	APHA-3120B Method	
SW-1	Barium	mg/l	0.032	-	Max 1		year	APHA-3120B Method	
	Selenium	mg/l	≤ 0.01	0.1	Max 0.02			APHA-3120B Method	
	Lead	mg/l	≤ 0.002	0.1	Max 0.2			APHA-3120B Method	
	Nickel	mg/l	0.026	0.5	Max 0.2			HACH 8027 Method	
	Cyanide	mg/l	< 0.002	1	Max 1			APHA 4500 CL G Method	
	Sulphide	mg/l	0.157	1	Max 1			HACH 8131 Method	
	Iron*7	mg/l	9.098	3.5	Max 3.5			APHA 3120 B ICP Method	
	Total Dissolved Solids	mg/l	1046	-	Max 2000			APHA 2540C Method	
	Total Residual Chlorine	mg/l	< 0.1	-	Max 0.2			APHA 4500-CI G Method	
	Chromium (Hexavalent)	mg/l	<0.05	0.1	Max 0.1			Spectrometric Method	
	Ammonia	mg/l	0.066	10	Max 10			HACH 10205 Method	
	Fluoride	mg/l	0.620	20	Max 20			APHA 4110 B Method	
	Silver		0.334	0.5	Max 0.5			APHA 3120 B ICP Method	

Location	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
SW-5	Temperature	°C	31	< 3 (increase)	Max 40		Twice in one year	Instrument Analysis Method	
	pH	-	9.0	6-9	5.0-9.0			Instrument Analysis Method	
	SS*2	mg/l	70	50	Mas 50			APHA 2540D Method	
	DO	mg/l	9.19	-	-			Instrument Analysis Method	
	BOD	mg/l	9.41	50	Max 20			APHA-5210B Method	
	COD(Cr)	mg/l	38.4	250	Max 70*4			APHA 5220D Method	
	Total Coliform*3	MPN/10	92,000	400	Max 400			APHA-9221B Method	
	T-N	0ml	2.1	-	Max 80			HACH Method 10072	
	T-P	mg/l	0.189	2	-			APHA 4500-P E Method	
	Color	mg/l	6.91	-	Max 150			APHA-2120C Method	
	Odor	Co.Pt	1	-	-			APHA-2150B Method	
	HS	Co Pt		1	Max 1	>=4		HACH 8131 Method	
	Oil and Grease	mg/l	<3.1	10	Max 5			APHA-5520B Method	
	Formaldehyde	mg/l	0.128	-	Max 1			USEPA Method 420.1 Method	
	Phenols	mg/l	0.032	0.5	Max 1	7.5×10^3		APHA 3120B	
	Free Chlorine	mg/l	<0.1	0.2	Max 1			HACH 8131	
	Zinc	mg/l	≤0.002	2	Max 5			APHA-3120B Method	
	Chromium	mg/l	0.01	0.5	Max 0.5			APHA-3120B Method	
	Arsenic	mg/l	≤0.01	0.1	Max 0.25			APHA-3120B Method	
	Copper	mg/l	0.004	0.5	Max 1			APHA-3120B Method	
	Mercury	mg/l	≤0.002	0.01	Max 0.005			APHA-3120B Method	

Location	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
	Cadmium	mg/l	≤0.002	0.1	Max 0.03			APHA-3120B Method	
	Barium	mg/l	0.036	-	Max 1			APHA-3120B Method	
	Selenium	mg/l	≤0.01	0.1	Max 0.02			APHA-3120B Method	
	Lead	mg/l	≤0.002	0.1	Max 0.2			APHA-3120B Method	
	Nickel	mg/l	0.012	0.5	Max 0.2			HACH 8027 Method	
	Cyanide	mg/l	<0.002	1	Max 1			APHA 4500 CL G Method	
	Sulphide	mg/l	0.092	1	Max 1			HACH 8131 Method	
	Iron	mg/l	3.336	3.5	Max 3.5			APHA 3120B ICP Method	
	Total Dissolved Solids	mg/l	214	-	Max 2000			APHA 2540C Method	
	Total Residual Chlorine	mg/l	0.1	-	Max 0.2			APHA 4500-CI G Method	
	Chromium (Hexavalent)	mg/l	< 0.05	0.1	Max 0.1			Spectrometric Method	
	Ammonia	mg/l	0.280	10	Max 10			HACH 10205 Method	
	Fluoride	mg/l	0.206	20	Max 20			APHA 4110 B Method	
	Silver	mg/l	0.196	0.5	Max 0.5			APHA 3120B ICP Method	
	Temperature	°C	30	< 3 (increase)	Max 40			Instrument Analysis Method	
	pH	-	6.9	6-9	5.0-9.0			Instrument Analysis Method	
	SS	mg/l	2	50	Mas 30		Twice in one	APHA 2540D Method	
	DO	mg/l	5.19	-	-	>=4	year	Instrument Analysis Method	
	BOD	mg/l	2.92	50	Max 20			APHA-5210B Method	
SW-6	COD(Cr)	mg/l	14	250	Max 70*4			APHA 5220D Method	
	Total Coliform*4	MPN/10	< 1.8	400	Max 400	7.5×10^3		APHA-9221B Method	

Location	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
	T-N	0ml	9.3	-	Max 80			HACH Method 10072	
	T-P	mg/l	0.356	2	-			APHA 4500-P E Method	
	Color	mg/l	0.62	-	Max 150			APHA-2120C Method	
	Odor	Co.Pt	1	-	-			APHA-2150B Method	
	HS	-	-	1	Max 1			HACH 8131 Method	
	Oil and Grease	mg/l	< 3.1	10	Max 5			APHA-5520B Method	
SW-6	Formaldehyde	mg/l	0.040	-	Max 1			USEPA Method 420.1 Method	
	Phenols	mg/l	<0.002	0.5	Max 1		Twice in one	APHA 3120B	
	Free Chlorine	mg/l	0.2	0.2	Max 1		year	HACH 8131	
	Zinc	mg/l	0.038	2	Max 5			APHA-3120B Method	
	Chromium	mg/l	≤ 0.002	0.5	Max 0.5			APHA-3120B Method	
	Arsenic	mg/l	≤ 0.01	0.1	Max 0.25			APHA-3120B Method	
	Copper	mg/l	≤ 0.002	0.5	Max 1			APHA-3120B Method	
	Mercury	mg/l	≤ 0.002	0.01	Max 0.005			APHA-3120B Method	
	Cadmium	mg/l	≤ 0.002	0.1	Max 0.03			APHA-3120B Method	
	Barium	mg/l	0.006	-	Max 1			APHA-3120B Method	
	Selenium	mg/l	≤ 0.01	0.1	Max 0.02			APHA-3120B Method	
	Lead	mg/l	≤ 0.002	0.1	Max 0.2			APHA-3120B Method	
	Nickel	mg/l	0.008	0.5	Max 0.2			HACH 8027 Method	
	Cyanide	mg/l	< 0.002	1	Max 1			APHA 4500 CL G Method	
	Sulphide	mg/l	< 0.005	1	Max 1			HACH 8131 Method	

Location	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
	Iron	mg/l	0.060	3.5	Max 3.5			APHA 3120B ICP Method	
	Total Dissolved Solids	mg/l	490	-	Max 2000			APHA 2540C Method	
	Total Residual Chlorine	mg/l	0.3	-	Max 0.2			APHA 4500-CI G Method	
	Chromium (Hexavalent)	mg/l	< 0.05	0.1	Max 0.5			Spectrometric Method	
	Ammonia	mg/l	0.267	10	Max 10			HACH 10205 Method	
	Fluoride	mg/l	1.653	20	Max 20			APHA 4110 B Method	
	Silver		≤ 0.002	0.5	Max 0.5			APHA 3120B ICP Method	
	Temperature	°C	29	< 3 (increase)	Max 40			Instrument Analysis Method	
	pH	-	7.5	6-9	5.0-9.0			Instrument Analysis Method	
	SS	mg/l	10	50	Mas 30			APHA 2540D Method	
	DO	mg/l	3.03	-	-	>=4		Instrument Analysis Method	
	BOD	mg/l	6.96	50	Max 20			APHA-5210B Method	
	COD(Cr)	mg/l	65	250	Max 70[4*]			APHA 5220D Method	
	Total Coliform[*5]	MPN/10	35,000	400	Max 400	7.5×10^3		APHA-9221B Method	
SW-2	T-N	0ml	1.2	-	Max 80			HACH Method 10072	
(Reference	T-P	mg/l	0.174	2	-			APHA 4500-P E Method	
Point)	Color	mg/l	22.12	-	Max 150		Twice in one	APHA-2120C Method	
	Odor	Co.Pt	1	-	-		year	APHA-2150B Method	
	HS	-	-	1	Max 1			HACH 8131 Method	
	Oil and Grease	mg/l	< 3.1	10	Max 5			APHA-5520B Method	
	Formaldehyde	mg/l	0.128	-	Max 1			USEPA Method 420.1 Method	

Location	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
SW-2 (Reference Point)	Phenols	mg/l	0.004	0.5	Max 1		Twice in one year	APHA 3120B	
	Free Chlorine	mg/l	0.1	0.2	Max 1			HACH 8131	
	Zinc	mg/l	≤ 0.002	2	Max 5			APHA-3120B Method	
	Chromium	mg/l	0.004	0.5	Max 0.5			APHA-3120B Method	
	Arsenic	mg/l	≤ 0.01	0.1	Max 0.25			APHA-3120B Method	
	Copper	mg/l	≤ 0.002	0.5	Max 1			APHA-3120B Method	
	Mercury	mg/l	≤ 0.002	0.01	Max 0.005			APHA-3120B Method	
	Cadmium	mg/l	≤ 0.002	0.1	Max 0.03			APHA-3120B Method	
	Barium	mg/l	0.034	-	Max 1			APHA-3120B Method	
	Selenium	mg/l	≤ 0.01	0.1	Max 0.02			APHA-3120B Method	
	Lead	mg/l	≤ 0.002	0.1	Max 0.2			APHA-3120B Method	
	Nickel	mg/l	0.004	0.5	Max 0.2			HACH 8027 Method	
	Cyanide	mg/l	<0.002	1	Max 1			APHA 4500 CL G Method	
	Sulphide	mg/l	0.011	1	Max 1			HACH 8131 Method	
	Iron	mg/l	2.862	3.5	Max 3.5			APHA 3120B ICP Method	
	Total Dissolved Solids	mg/l	222	-	Max 2000			APHA 2540C Method	
	Total Residual Chlorine	mg/l	0.1	-	Max 0.2			APHA 4500-CI G Method	
	Chromium (Hexavalent)	mg/l	< 0.05	0.1	Max 0.5			Spectrometric Method	
	Ammonia	mg/l	0.490	10	Max 10			HACH 10205 Method	
	Fluoride	mg/l	0.099	20	Max 20			APHA 4110 B Method	
	Silver		0.042	0.5	Max 0.5			APHA 3120B ICP Method	

Location	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
SW-4 (Reference Point)	Temperature	°C	30	< 3 (increase)	Max 40		Twice in one year	Instrument Analysis Method	
	pH	-	7.9	6-9	5.0-9.0			Instrument Analysis Method	
	SS*4	mg/l	82	50	Mas 30			APHA 2540D Method	
	DO	mg/l	7.05	-	-			Instrument Analysis Method	
	BOD	mg/l	8.32	50	Max 20			APHA-5210B Method	
	COD(Cr)	mg/l	18.3	250	Max 70*4			APHA 5220D Method	
	Total Coliform*5	MPN/10	54,000	400	Max 400			APHA-9221B Method	
	T-N	0ml	1.7	-	Max 80			HACH Method 10072	
	T-P	mg/l	0.205	2	-			APHA 4500-P E Method	
	Color	mg/l	6.22	-	Max 150			APHA-2120C Method	
	Odor	Co.Pt	1	-	-			APHA-2150B Method	
	HS	-	-	1	Max 1	>=4		HACH 8131 Method	
	Oil and Grease	mg/l	< 3.1	10	Max 5			APHA-5520B Method	
	Formaldehyde	mg/l	0.126	-	Max 1			USEPA Method 420.1 Method	
	Phenols	mg/l	< 0.002	0.5	Max 1	7.5×10^3		APHA 3120B	
	Free Chlorine	mg/l	0.1	0.2	Max 1		Twice in one year	HACH 8131	
	Zinc	mg/l	0.066	2	Max 5			APHA-3120B Method	
	Chromium	mg/l	0.018	0.5	Max 0.5			APHA-3120B Method	
	Arsenic	mg/l	0.01	0.1	Max 0.25			APHA-3120B Method	
	Copper	mg/l	≤ 0.002	0.5	Max 1			APHA-3120B Method	
	Mercury	mg/l	≤ 0.002	0.01	Max 0.005			APHA-3120B Method	

Location	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
	Cadmium	mg/l	≤ 0.002	0.1	Max 0.03			APHA-3120B Method	
	Barium	mg/l	0.036	-	Max 1			APHA-3120B Method	
	Selenium	mg/l	≤ 0.01	0.1	Max 0.02			APHA-3120B Method	
	Lead	mg/l	≤ 0.002	0.1	Max 0.2			APHA-3120B Method	
	Nickel	mg/l	0.018	0.5	Max 0.2			HACH 8027 Method	
	Cyanide	mg/l	< 0.002	1	Max 1			APHA 4500 CL G Method	
	Sulphide	mg/l	0.015	1	Max 1			HACH 8131 Method	
	Iron*7	mg/l	5.920	3.5	Max 3.5			APHA 3120B ICP Method	
	Total Dissolved Solids	mg/l	764	-	Max 2000			APHA 2540C Method	
	Total Residual Chlorine	mg/l	0.1	-	Max 0.2			APHA 4500-CI G Method	
	Chromium (Hexavalent)	mg/l	< 0.05	0.1	Max 0.5			Spectrometric Method	
	Ammonia	mg/l	0.260	10	Max 10			HACH 10205 Method	
	Fluoride	mg/l	0.216	20	Max 20			APHA 4110 B Method	
	Silver		0.24	0.5	Max 0.5			APHA 3120B ICP Method	
	Temperature	°C	32	None	Max 40			Instrument Analysis Method	
	pH	-	8.1	(Available	5.0-9.0			Instrument Analysis Method	
	SS	mg/l	50	Guideline	Max 30			APHA 2540D Method	
GW-1	DO	mg/l	6.85	value	-	>=4	Twice in one	Instrument Analysis Method	
(Reference	BOD	mg/l	5.42	determined	Max 20		year	APHA-5210B Method	
Point)	COD(Cr)	mg/l	6.9	by	Max 70*4			APHA 5220D Method	
	Total Coliform*6	MPN/10	920	MONREC)	Max 400	7.5×10^3		APHA-9221B Method	

Location	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
	T-N	0ml	2		Max 80			HACH Method 10072	
	T-P	mg/l	< 0.05		-			APHA 4500-P E Method	
	Color	mg/l	0		Max 150			APHA-2120C Method	
	Odor	Co.Pt	1		-			APHA-2150B Method	
	HS	-	-		Max 1			HACH 8131 Method	
	Oil and Grease	mg/l	< 3.1		Max 5			APHA-5520B Method	
	Formaldehyde	mg/l	0.069		Max 1			USEPA Method 420.1 Method	
	Phenols	mg/l	< 0.002		Max 1			APHA 3120B	
	Free Chlorine	mg/l	< 0.1		Max 1			HACH 8131	
GW-1	Zinc	mg/l	< 0.034		Max 5			APHA-3120B Method	
(Reference	Chromium	mg/l	≤ 0.002		Max 0.5			APHA-3120B Method	
Point)	Arsenic	mg/l	≤ 0.01		Max 0.25			APHA-3120B Method	
	Copper	mg/l	≤ 0.002		Max 1			APHA-3120B Method	
	Mercury	mg/l	≤ 0.002		Max 0.005			APHA-3120B Method	
	Cadmium	mg/l	≤ 0.002		Max 0.03		Twice in one	APHA-3120B Method	
	Barium	mg/l	0.102		Max 1		year	APHA-3120B Method	
	Selenium	mg/l	≤ 0.01		Max 0.02			APHA-3120B Method	
	Lead	mg/l	≤ 0.002		Max 0.2			APHA-3120B Method	
	Nickel	mg/l	≤ 0.002		Max 0.2			HACH 8027 Method	
	Cyanide	mg/l	< 0.002		Max 1			APHA 4500 CL G Method	
	Sulphide	mg/l	< 0.005		Max 1			HACH 8131 Method	

Location	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*[1]Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
GW-1 (Reference Point)	Iron	mg/l	0.654		Max 3.5			APHA 3120B ICP Method	
	Total Dissolved Solids	mg/l	1,556		Max 2000			APHA 2540C Method	
	Total Residual Chlorine	mg/l	0.1		Max 0.2			APHA 4500-CI G Method	
	Chromium (Hexavalent)	mg/l	< 0.05		Max 0.5			Spectrometric Method	
	Ammonia	mg/l	2.16		Max 10			HACH 10205 Method	
	Fluoride	mg/l	0.022		Max 20			APHA 4110 B Method	
	Silver	mg/l	≤ 0.002		Max 0.5			APHA 3120B ICP Method	

*[1]Remark: Referred to the Vietnam Standard (EIA Report), Reference to the Water Quality Monitoring Report, June 2019.

*[2]Remark: In SW1 and SW-5, SS are higher than the target value due to the expected reason- i) surface water run-off from bare land in Zone A.

*[3]Remark: In SW-1 and SW-5, Total coliform are higher than the target value due to the expected reason- i) the potential expected reason might natural bacteria existed in all area of Zone A because there are various kinds of vegetation and creature such as birds and small animals in and along the retention canals and retention pond. Total coliform do not affect human health directly, self-monitoring for E.Coli analysis was carried out to identify health impact by coliform bacteria. As for the result of E.Coli for SW1 was 12 & SW5 was 3.6 and they were under the reference under target value. It is considered that there is no significant impact to human health.

*[4]Remark: For reference monitoring points SW-4, the result of suspended solids is higher than the target value due to two expected reason: i) delivered from upstream area such as natural origin and wastewater from the other industrial area outside of Thilawa SEZ and ii) influence by water from downstream of monitoring points due to flow back by tidal fluctuation.

*[5]Remark: For reference monitoring points (SW2 and SW-4), the result of total coliform is higher than the target value due to two expected reason: i) runoff of animal waste from the undeveloped area and delivered from local industrial zone and illegal dumping site from outside of Thilawa SEZ in the upstream area ii) delivered from surrounding area by tidal effect.

*[6]Remark: In GW-1, Total coliform are higher than the target value due to the expected reason- i) the poor maintenance of well which can increase the risk of bacteria and other harmful organisms ii) the well was not operated regularly and didn't use for local people long time. Total coliform do not affect human health directly, self-monitoring for E.Coli

analysis was carried out to identify health impact by coliform bacteria. As for the result of E.Coli for GW1 was 2 and it was under the reference under target value. It is considered that there is no significant impact to human health.

*7Remark: For reference monitoring points (SW-1 and SW-4), the result of iron is higher than the target value due to the expected reason is due to the influence of natural origin (iron can reach out from the soil by run-off). For the living environment item, the standard value for soluble iron level is 10mb/L. As the comparison with the living environment standard value in Japan, iron results are lower than the standard value. Therefore, it can be considered that there is no significant impact on the living environment.

2)(c) Water Quality – August 2019

Measuring Point: Effluent of Wastewater

- 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	Country's Standard	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
SW-1	pH	-	7.5	6-9	5.0-9.0		Once in two months	Instrument Analysis Method	
	SS*2	ppm	96	50	Max.30			APHA 2540D Method	
	DO	ppm	7.03	-	-	>=4		Instrument Analysis Method	
	COD(Cr)	ppm	42	250	Max.70			APHA 5220D Method	
	BOD	ppm	4.45	50	Max.20			APHA-5210B Method	
	T-N	ppm	2.4	-	Max.80			HACH Method 10072	
	T-P	ppm	0.24	2	-			APHA 4500-P E Method	
	Color	Co.Pt	1.79	-	-	7.5×10^3		APHA 2120C Method	
	Odor	Co.Pt	1	-	-			APHA 2150B Method	
	Total coliforms*3	MPN/100ml	>160000	400	Max.400			APHA 9221B Method	
	pH	-	7.8	6-9	5.0-9.0		Once in two months	Instrument Analysis Method	

Location	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
SW-5	SS*2	ppm	244	50	Max.30	>=4		APHA 2540D Method	
	DO	ppm	6.87	-	-			Instrument Analysis Method	
	COD(Cr)	ppm	5.7	250	Max.70			APHA 5220D Method	
	BOD	ppm	3.24	50	Max.20			APHA-5210B Method	
	T-N	ppm	5.2	-	Max.80			HACH Method 10072	
	T-P	ppm	0.543	2	-	7.5×10^3		APHA 4500-P E Method	
	Color	Co.Pt	1.45	-	-			APHA 2120C Method	
	Odor	Co.Pt	1	-	-			APHA 2150B Method	
	Total coliforms*3	MPN/100ml	54000	400	Max.400			APHA 9221B Method	
SW-6	pH	-	7.1	6-9	5.0-9.0		Once in two months	Instrument Analysis Method	
	SS	ppm	10	50	Max.30			APHA 2540D Method	
	DO	ppm	6.10	-	-			Instrument Analysis Method	
	COD(Cr)	ppm	9.4	250	Max.70			APHA 5220D Method	
	BOD	ppm	0.26	50	Max.20	>=4		APHA-5210B Method	
	T-N	ppm	6.7	-	Max.80			HACH Method 10072	
	T-P	ppm	0.371	2	-			APHA 4500-P E Method	
	Color	Co.Pt	2.37	-	-			APHA 2120C Method	
	Odor	Co.Pt	1	-	-			APHA 2150B Method	
	Total coliforms	MPN/100ml	< 1.8	400	Max.400	7.5×10^3		APHA 9221B Method	
	pH	-	6.9	6-9	5.0-9.0		Once in two months	Instrument Analysis Method	
	SS*4	ppm	78	50	Max.30	>=4		APHA 2540D Method	

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Location	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
SW-2 (Reference Point)	DO	ppm	6.91	-	-			Instrument Analysis Method	
	COD(Cr)	ppm	11.6	250	Max.70			APHA 5220D Method	
	BOD	ppm	4.10	50	Max.20			APHA-5210B Method	
	T-N	ppm	2.6	-	Max.80			HACH Method 10072	
	T-P	ppm	0.225	2	-			APHA 4500-P E Method	
	Color	Co.Pt	6.54	-	-			APHA 2120C Method	
	Odor	Co.Pt	1	-	-			APHA 2150B Method	
	Total coliforms*5	MPN/100ml	>160,000	400	Max.400			APHA 9221B Method	
SW-4 (Reference Point)	pH	-	7.1	6-9	5.0-9.0	>=4	Once in two months	Instrument Analysis Method	
	SS*4	ppm	232	50	Max.30			APHA 2540D Method	
	DO	ppm	6.43	-	-			Instrument Analysis Method	
	COD(Cr)	ppm	5.2	250	Max.70			APHA 5220D Method	
	BOD	ppm	2.99	50	Max.20			APHA-5210B Method	
	T-N	ppm	3.2	-	Max.80			HACH Method 10072	
	T-P	ppm	0.470	2	-			APHA 4500-P E Method	
	Color	Co.Pt	3.49	-	-			APHA 2120C Method	
	Odor	Co.Pt	1	-	-			APHA 2150B Method	
	Total coliforms*5	MPN/100ml	11,000	400	Max.400			APHA 9221B Method	
	pH	-	8.1	None (Available Guideline value	None (Available Guideline	5.5~9.0	Once in two months	Instrument Analysis Method	
	SS	ppm	4			50		APHA 2540D Method	
	DO	ppm	7.90			>=4		Instrument Analysis Method	

Location	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*[1]Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
GW-1 (Reference Point)	COD(Cr)	ppm	7	determined by MONREC)	Value determined by MOI)	60		APHA 5220D Method	
	BOD	ppm	2.27			15		APHA-5210B Method	
	T-N	ppm	4.1			-		HACH Method 10072	
	T-P	ppm	0.124			-		APHA 4500-P E Method	
	Color	Co.Pt	0.00			-		APHA 2120C Method	
	Odor	Co.Pt	1			-		APHA 2150B Method	
	Total coliforms	MPN/100ml	23			7.5×10^3		APHA 9221B Method	

[1]*Remark: Referred to the Vietnam Standard (EIA Report), Reference to the Water Quality Monitoring Report, August 2019.

*[2]Remark: In SW-1 and SW-5, suspended solids are higher than the standard due to the expected reason- i) surface water run-off from bare land in Zone A.

*[3]Remark: In SW1, SW5 Total coliform is higher than the standard due to the expected reason i) the potential expected reason might natural bacteria existed in all area of Zone A because there are various kinds of vegetation and creature such as birds, and small animals in and along the retention canals and retention ponds. Total coliform do not affect human health directly, self-monitoring for E.Coli analysis was carried out to identify health impact by coliform bacteria. As for the result of E.Coli for SW1 was 9.1, SW5 was 6 and it was under the target value. It is considered that there is no significant impact to human health.

*[4]Remark: For reference monitoring points SW2 and SW-4, the result of suspended solids is higher than the standard due to two expected reason: i) delivered from upstream area such as natural origin and wastewater from the local industrial zone which outside of Thilawa SEZ and ii) influence by water from downstream of monitoring points due to flow back by tidal fluctuation.

*[5]Remark: For reference monitoring points (SW-2 and SW-4), the result of total coliforms is higher than the standard due to two expected reason: i) runoff of animal waste from the undeveloped area and delivered from local industrial zone and illegal dumping site from outside of Thilawa SEZ in the upstream area and ii) delivered from surrounding area by tidal effect.

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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
Regular Soil Contamination Monitoring conducted and attached the Report in Appendix.	

4) Noise

Remarks: According to EIA report, Chapter 4- Table 4-2.2, monitoring plan is one time each in dry and wet season (First 3 years after operation stage). In the environmental monitoring report (Phase-1, operation phase) No.1, one time noise and vibration monitoring survey is finished as a record and there is no excess the standard in all of survey points. There is not much operation stage industry in current and monitoring will start after consult with environmental expert.

Noise Level (Along the Thilawa Development Road)

Location	Item	Unit	Measured Value (Mean)	Measured Value (Min~Max)	Country's Standard	Target value to be applied	*Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
NV-1	Leq (day)	dB(A)	61	58-64	N/A	75		One time each in dry and wet season	Sound Level Meter	
	Leq(eve)	dB(A)	56	52-59		70				

*Remark: Referred to the Target Noise Standard (Thilawa SEZ Zone-A EIA Report) and Reference to Noise and Vibration Monitoring Report (August 2019)

Noise Level (Living Environment)

Location	Item	Unit	Measured Value (Mean)	Measured Value (Min~Max)	Country's Standard	*Target value to be applied	Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
NV-2	Leq (day)	dB(A)	67	60-66	N/A	70		One time each in dry and wet season	Sound Level Meter	
	Leq(eve)	dB(A)	60	53-59		65				
	Leq(night)	dB(A)	54	44-57		60				
NV-3	Leq(day)	dB(A)	52	49-54	N/A	70			Sound level Meter	
	Leq(eve)	dB(A)	51	49-52		65				
	Leq(night)	dB(A)	49	46-53		60				

*Remark: Referred to the Target Noise Standard (Thilawa SEZ Zone-A EIA Report) and Reference to Noise and Vibration Monitoring Report (August 2019)

Complaints from Residents

- Are there any complains 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 Complains from Residents	Countermeasures

5) Solid Waste (Disposal from admin complex compound)

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

- Are there any wastes of 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.

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No.	Date	Description	No. of Kgs	Remarks
1	April 2019	General Waste Disposal	2080	Golden Dowa Eco-system Myanmar Co.,Ltd
2	May 2019	General Waste Disposal	3860	Golden Dowa Eco-system Myanmar Co.,Ltd
3	June 2019	General Waste Disposal	2780	Golden Dowa Eco-system Myanmar Co.,Ltd
4	July 2019	General Waste Disposal	5320	Golden Dowa Eco-system Myanmar Co.,Ltd
5	August 2019	General Waste Disposal	2880	Golden Dowa Eco-system Myanmar Co.,Ltd
6	September 2019	General Waste Disposal	2240	Golden Dowa Eco-system Myanmar Co.,Ltd

Remark: Attached general waste disposal record (Admin Complex Compound) in appendix.

Remark: Admin complex compound waste disposal reported in the Operation phase, Environmental Monitoring Report because the waste from common area of Thilawa SEZ is storing in the admin complex trash storage. Each locator will submit according to ECPP approval for the waste disposal record directly to the Environmental Section, One Stop Service Center, Thilawa SEZ Management Committee.

6) (a) Ground Subsidence and Hydrology- April 2019

Duration (Week)	Water Consumption		Ground Level		Frequency	Note
	Quantity	Unit	Quantity	Unit		
8-April-2019	-	m3/week	+7.134	m	Once a week	
22- April -2019	-	m3/week	+7.133	m		
30- April 2019	-	m3/week	+7.131	m		

*** Remarks: Attached ground subsidence monitoring status (Operation Phase) in appendix. There is no ground water consumption in Zone-A industrial area and will monitor and descript the water consumption quantity if using the tube well.**

(b) Ground Subsidence and Hydrology- May 2019

Duration (Week)	Water Consumption		Ground Level		Frequency	Note
	Quantity	Unit	Quantity	Unit		
9-May-2019	-	m3/week	+7.132	m	Once a week	
10-May-2019	-	m3/week	+7.132	m		
22- May -2019	-	m3/week	+7.131	m		
31- May -2019	-	m3/week	+7.131	m		

* Remarks: Attached ground subsidence monitoring status (Operation Phase) in appendix.

(c) Ground Subsidence and Hydrology- June 2019

Duration (Week)	Water Consumption		Ground Level		Frequency	Note
	Quantity	Unit	Quantity	Unit		
7-June-2019	-	m3/week	+7.130	m	Once a week	
14- June -2019	-	m3/week	+7.131	m		
21- June -2019	-	m3/week	+7.132	m		
28- June -2019	-	m3/week	+7.132	m		

* Remarks: Attached ground subsidence monitoring status (Operation Phase) in appendix.

(d) Ground Subsidence and Hydrology- July 2019

Duration (Week)	Water Consumption		Ground Level		Frequency	Note
	Quantity	Unit	Quantity	Unit		
5-July-2019	-	m3/week	+7.132	m	Once a week	
12-July -2019	-	m3/week	+7.133	m		
24-July 2019	-	m3/week	+7.133	m		
31-July 2019	-	m3/week	+7.133	m		

* Remarks: Attached ground subsidence monitoring status (Operation Phase) in appendix.

(e) Ground Subsidence and Hydrology- August 2019

Duration (Week)	Water Consumption		Ground Level		Frequency	Note
	Quantity	Unit	Quantity	Unit		
5-August-2019	-	m3/week	+7.133	m	Once a week	
12-August-2019	-	m3/week	+7.134	m		
20-August-2019	-	m3/week	+7.133	m		
30-August-2019	-	m3/week	+7.134	m		

* Remarks: Attached ground subsidence monitoring status (Operation Phase) in appendix.

(f) Ground Subsidence and Hydrology- September 2019

Duration (Week)	Water Consumption		Ground Level		Frequency	Note
	Quantity	Unit	Quantity	Unit		
6-September-2019	-	m3/week	+7.135	m	Once a week	
13-September-2019	-	m3/week	+7.135	m		
20-September-2019	-	m3/week	+7.136	m		
30-September-2019	-	m3/week	+7.136	m		

* Remarks: Attached ground subsidence monitoring status (Operation Phase) in appendix.

7) Offensive Odor (only operation phase) Not Applicable at Construction Phase Report

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 Not Applicable at Construction Phase Report

- 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
An accident was occurred on 11th April 2019 a car was bump to composite of Main Gate. This car was from CAS construction group (D-1 D-2 under construction site sub com).	MjTD take the action as per following: - Remind to drive carefully in furture.
An accident was occurred on 21th May 2019 car and motorbike was happened accidence case in front of (A-21). They come from same direction and car immediately turn left. So incident case happened. There was no injury in this case.	MjTD take the action as per following: - Remind to drive carefully in furture.
An accident was occurred on 13th June 2019 on Dagon Thilawa road in front of MJTD Admin building. They drove same direction and the motorbike rider followed the dump truck. The dump truck didn't show signal and turned to left way suddenly. So the worker fell down on the road. He got small injury in his left leg and his bike was damaged. The dump truck ran away with high speed.	MjTD take the action as per following: - We called ambulance car. - Send the injured persons to hospital.
An accident was occurred on 17th June 2019 on the Dagon Thilawa Road in front of Admin	MjTD take the action as per following:

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED MJTD

Contents of Incidents	Countermeasures
Building outside area of Thilawa SEZ. The perpetrated lorry truck was hit with high speed to the back of another lorry truck. The perpetrated truck driver had serious injury and the lorry truck also.	- We called ambulance car. - Send the injured persons to hospital.
An accident was occurred on 20th July 2019 on the Dagon Thilawa road Outside area of Thilawa SEZ Zone A .Car and motorbike were accident happened.The two motorbike person were injuried and bringing to Thanlyin General hospital. Motobike was also little damaged.	MjTD take the action as per following: - We called thanlyin police. - Send the injured persons to hospital.
An accident was occurred on 23th July 2019 on Thilawa Development road near A-2 site Outside area of Thilawa SEZ Zone A. A car hit the MJTD temporary fence near A-2. Car was little damage and there was no injury.	MjTD take the action as per following: - Remind to drive carefully in furture and explained the traffic rule.
An accident was occurred on 13th August 2019 on Thilawa Development road (External area of Thilawa SEZ Zone A).A car was happened incident case due to his wheel pop off.	MjTD take the action as per following: - We inform kyaut tan traffic police.

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

End of Document

Thilawa Special Economic Zone (Zone A)

Development Project (Operation Phase)

Appendix

Water and Waste Water Monitoring Report

April, 2019

WATER QUALITY MONITORING REPORT

FOR DEVELOPMENT OF INDUSTRIAL AREA

IN THILAWA SEZ ZONE A

(OPERATION STAGE)

(Bi-Monthly Monitoring)

April 2019

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 A 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-1, SW-2, SW-4, SW-5, SW-6, and GW-1 have been monitored in Thilawa SEZ and its surrounding area in timely manner. Among the six locations, SW-1 and SW-5 are main discharged points of Thilawa SEZ and SW-6 is discharged from centralized Sewage Treatment Plant (STP) which is required to monitor by Environmental Monitoring Plan (EMoP) in EIA report of Thilawa SEZ Zone A. The remaining points SW-2 and SW-4 are sampled as a reference monitoring for comparison with discharged points and baseline of discharged creek. Moreover, GW-1 is monitored as a reference of existing tube well which is located in the monastery compound. Location of sampling points for water quality monitoring is shown in Figure 1.1-1.

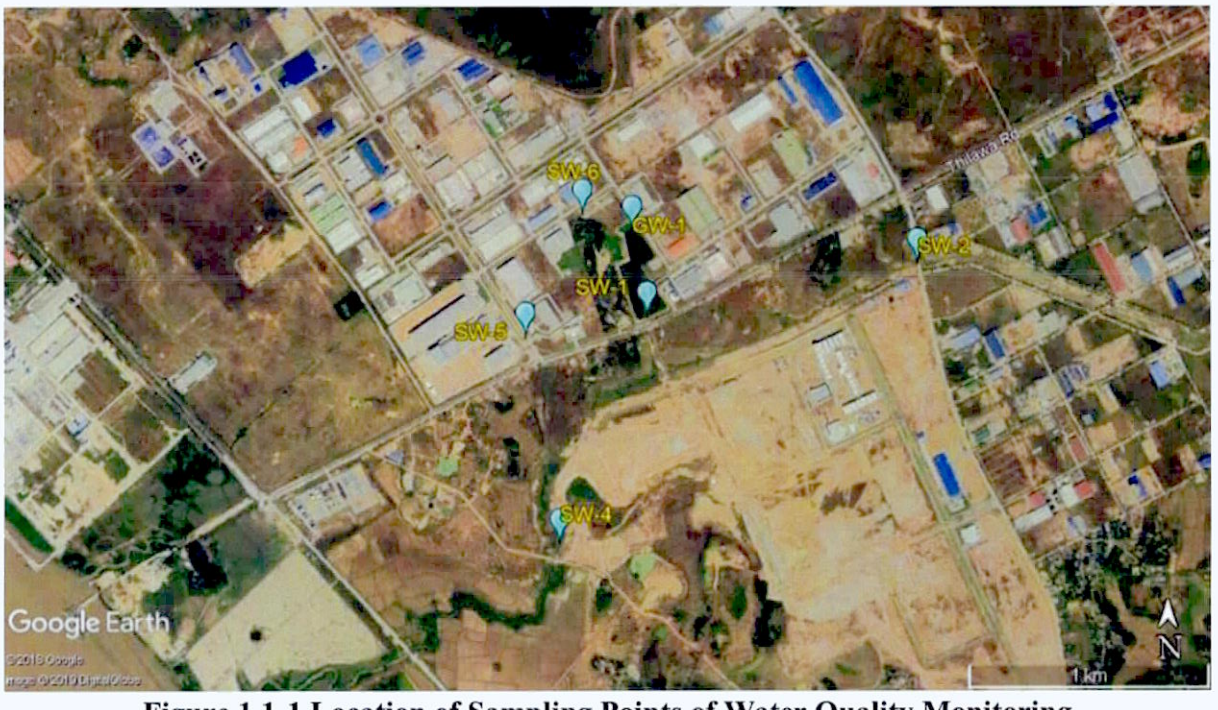

Figure 1.1-1 Location of Sampling Points of Water Quality Monitoring

CHAPTER 2: WATER QUALITY MONITORING

2.1 Monitoring Items

Sampling points and parameters for water quality monitoring are determined so as 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 carried out at three locations (SW-4, SW-5 and SW-6) 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-1	SW-2	SW-4	SW-5	SW-6	GW-1	Remarks
1	pH	○	○	○	○	○	○	On-site measurement
2	Water Temperature	○	○	○	○	○	○	On-site measurement
3	DO	○	○	○	○	○	○	On-site measurement
4	$BOD_{(5)}$	○	○	○	○	○	○	Laboratory analysis
5	$COD_{(Cr)}$	○	○	○	○	○	○	Laboratory analysis
6	Total Nitrogen	○	○	○	○	○	○	Laboratory analysis
7	Suspended Solids	○	○	○	○	○	○	Laboratory analysis
8	Total Coliform	○	○	○	○	○	○	Laboratory analysis
9	Total Phosphorous	○	○	○	○	○	○	Laboratory analysis
10	Color	○	○	○	○	○	○	Laboratory analysis
11	Odor	○	○	○	○	○	○	Laboratory analysis
12	Oil and Grease (Self-monitoring)	○	○	○	○	○	○	Laboratory analysis
13	Total Dissolved Solids (Self-monitoring)	○	○	○	○	○	○	Laboratory analysis
14	Iron (Self-monitoring)	○	○	○	○	○	○	Laboratory analysis
15	Mercury (Self-monitoring)	○	○	○	○	○	○	Laboratory analysis
16	Escherichia Coli (Self-monitoring)	○	-	-	○	-	○	Laboratory analysis
17	Flow Rate	-	-	○	○	○	-	On-site measurement

Source: Myanmar Koei International Ltd.

2.2 Description of Sampling Points

The outline of sampling points is mentioned in Table 2.1-1. 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-1	**Coordinate** - N - 16° 40' 13.5", E - 96° 16' 39.8"
		Location - Outlet of Retention Pond
		Survey Item – Surface water sampling.
2	SW-2	**Coordinate** - N - 16° 40' 20.69", E - 96° 17' 18.04"
		Location - Upstream of Shwe Pyauk Creek
		Survey Item – Surface water sampling.
3	SW-4	**Coordinate**- N - 16° 39' 42.84", E - 96° 16' 27.42"
		Location - Downstream of Shwe Pyauk Creek
		Survey Item – Surface water sampling and water flow rate measurement.
4	SW-5	**Coordinate**- N - 16° 40' 10.7", E - 96° 16' 22.6"
		Location - Outlet of Retention Canal
		Survey Item – Surface water sampling and water flow rate measurement.
5	SW-6	**Coordinate**- N - 16° 40' 27.13", E - 96° 16' 30.68"
		Location - Outlet from STP to Retention Pond
		Survey Item – Surface water sampling and water flow rate measurement.
6	GW-1	**Coordinate**- N - 16° 40' 25.10", E - 96° 16' 31.70"
		Location - In Moegyoe Swan Monastery
		Survey Item – Ground Water Sampling.

Source: Myanmar Koei International Ltd.

SW-1

SW-1 was collected at the discharge point of retention pond which is located in the east of Moegyoe Swan monastery. This drainage is flowing from north to south and then connected to the Shwe Pyauk creek through earth drain. The water quality of this monitoring point has been influenced by the water from downstream due to flow back by tidal fluctuation. In addition, it seems that a part of wastewater from monastery has reached to the culvert in the SEZ area and discharging to the retention pond.

SW-2 (Reference Point)

SW-2 was collected at the upstream of Shwe Pyauk creek. This sampling point is located in the southeast of Zone A area and at the south of Dagon-Thilawa road. The surrounding areas are Zone B in the southwest and local industrial zone in the east respectively.

SW-4 (Reference Point)

SW-4 was collected at the downstream of Shwe Pyauk creek, after mixing of discharge 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. This sampling point is located in the southwest of Zone A area and in the south of Dagon-Thilawa road. The surrounding areas are Zone B and local industrial zone in the east respectively.

SW-5

SW-5 was collected at retention canal near main gate of Thilawa SEZ. Most of the water collected in this canal is rain water and domestic wastewater from surrounding. This canal is also connected to the Shwe Pyauk creek. The water quality of this monitoring point may have been influenced by the water from downstream due to flow back by tidal fluctuation.

SW-6

SW-6 was collected at the drain outlet of centralized STP which is located in the north of Moegyoe Swan monastery compound and retention pond (SW-1). Then the treated water is flowing to the retention pond.

GW-1 (Reference of Existing Tube Well)

GW-1 was collected from tube well as ground water sample. It is located in the compound of Moegyoe Swan monastery. The surrounding areas are Zone A in the west, retention pond in the east and Dagon-Thilawa road in the south respectively.

2.3 Monitoring Method

All water samples were collected with cleaned sampling bottles 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	Water 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	Total Nitrogen (T-N)	HACH Method 10072(TNT Persulfate Digestion Method)
7	Suspended Solids (SS)	APHA 2540D (Dry at 103-105°C Method)
8	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)
9	Total Phosphorous (T-P)	APHA 4500-P E (Ascorbic Acid Method)
10	Color	APHA 2120C (Spectrophotometric Method)
11	Odor	APHA 2150 B (Threshold Odor Test)
12	Oil and Grease	APHA 5520 B (Partition – Gravimetric Method)
13	Total Dissolved Solids	APHA 2540 C (Total Dissolved Solids Dried at 180°C)
14	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
15	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
16	Escherichia Coli	APHA 9221 F (Escherichia Coli Procedure Using Fluorogenic Substrate)
17	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 conducted on 24 April 2019 and sampling time is shown in Table 2.4-1 to avoid tidal effect. The tide record for Yangon River, Myanmar on 24 April 2019 is shown in Table 2.4-2

Table 2.4-1 Sampling Time of Each Station

No.	Station	Sampling Time
1	SW-1	24/04/2019 10:24
2	SW-2	24/04/2019 12:37
3	SW-4	24/04/2019 09:07
4	SW-5	24/04/2019 10:56
5	SW-6	24/04/2019 10:01
6	GW-1	24/04/2019 14:34

Source: Myanmar Koei International Ltd.

Table 2.4-2 Tide Record for Yangon River, Myanmar

Date	Time	Height	Tide Conditions
24/04/2019	02:59	0.50	Low Tide
	07:42	5.19	High Tide
	14:35	0.71	Low Tide
	19:48	5.45	High Tide

Source: Myanmar Port Authority, Tide Table for the Yangon River and Elephant Point, 2019.

2.5 Monitoring Results

Results of water quality monitoring are summarized in Table 2.5-1. Analytical results of the laboratory are described in Appendix-2, Appendix-3 and Appendix-4. 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 Water Quality at the Outlet of Sewage Treatment Plant of Industrial Area of Thilawa SEZ and at the Point before Discharging to Creek

As the comparison with the target value, the results of total coliform, total dissolved solids (TDS) and iron exceeded than the target values.

As for the result of total coliform of surface water, the result at the outlet of the centralized STP (SW-6) complied with the target value. It may prove that effluents from each locator was treated well by the STP. On the other hand, results at monitoring points of retention pond (SW-1) and retention canal (SW-5) exceeded the target value due to the expected reason; the potential expected reason might be natural bacteria existed in all area of Zone A because there are various kinds of vegetation and creature such as birds, and small animals in and along the retention canals and retention ponds.

Since the composition of the total coliform include bacteria from natural origin, and even after total coliform do not affect human health directly, self-monitoring for E. Coli analysis was carried out to identify health impact by coliform bacteria. As for the result of E.Coli of surface water, all of results were under the reference value. Therefore, although the target value of total coliform exceeded at monitoring point of retention pond (SW-1) and retention canal (SW-5), but it is considered that there is no significant impact on human health.

As for the result of total dissolved solids (TDS), the result at the outlet of the centralized STP (SW-6) complied with the target value. It implied that effluents from each locator was treated well by the STP. On the other hand, results at monitoring point of retention pond (SW-1), exceeded the target value due to the expected reason; it maybe due to the soil erosion caused by construction of factories in Zone A and the eroded soil particles may contain soluble components that can dissolve in water. Moreover, the decaying plants and animals in the retention pond may lead to the increase of dissolved solids. However, since it cannot reach to the conclusion of what is the reason for this result, the continuous monitoring will be necessary.

As for the result of the iron, the result at the outlet of the centralized STP (SW-6) complied with the target value. It implied that effluents from each locator was treated well by the STP. On the other hand, the result at the monitoring point of retention canal (SW-5) exceeded the target value may be due to the influence of natural origin (iron can reach out from the soil by run-off). Japan set effluent standards for two items as follows; i) health item and ii) living environment item. In the health item, there is no standard value for iron. On the other hand, for the living environment item, the standard value for soluble iron level is 10 mg/l. As the comparison with the living environment standard value in Japan, iron result in SW-5 is lower than the standard value. Therefore, it can be considered that there is no significant impact on the living environment.

On the bases of the above examinations, the following actions shall be taken to monitor the impact on human health;

- To continue the self-monitoring for Escherichia coli (E. Coli) level to identify health impact by coliform bacteria (While result of Total coliform exceeded the target value)

Perhaps, the possibility that water flowing through the retention canals might include overflowed water from some construction sites with insufficient treatment of coliform should not be excluded from the possible cause.

Table 2.5-1 Results of Water Quality Monitoring at Main Discharged Gates and Discharged from Centralized STP

No.	Parameters	Unit	SW-1	SW-5	SW-6	Target Value (Reference Value for Self-Monitoring)
1	Temperature	°C	29	31	28	≤ 35
2	pH	-	8.34	8.76	7.15	6 ~ 9
3	Suspended Solid (SS)	mg/L	18.00	40.00	4.00	50
4	Dissolved Oxygen (DO)	mg/L	8.84	7.85	6.65	-
5	BOD (5)	mg/L	7.07	8.16	0.66	30
6	COD (Cr)	mg/L	26.4	26	17.8	125
7	Total Coliform	MPN/ 100ml	24000	160000	<1.8	400
8	Total Nitrogen (T-N)	mg/L	1.9	2.5	17.3	80
9	Total Phosphorous (T-P)	mg/L	<0.050	0.39	0.639	2
10	Color	TCU (True Color Unit)	4.09	6.18	4.64	150
11	Odor	TON (Threshold Odor Number)	1	1.4	1.4	-
12	Oil and Grease	mg/L	<3.1	<3.1	<3.1	10
13	Total Dissolved Solids	mg/L	5432.00	308.00	672.00	2000
14	Iron	mg/L	0.362	6.542	0.068	3.5
15	Mercury	mg/L	≤0.002	≤0.002	≤0.002	0.005
16	Escherichia Coli	MPN/100ml	21.0	17.0	-	(1,000)* (CFU/100ml)
17	Flow Rate	m^3/s	-	0.012	0.025	-

Note: Red color means exceeded value than target value.

*Note: Based on the water utilization at discharged creek, water quality C of quality standard for water baths in Japan, (Ministry of Environment, 1997) is set as a reference value for self-monitoring of E. coli for surface water monitoring. However, due to limitation of capacity for analytical laboratory in Myanmar, the method to analyze the "Colony Forming Unit (CFU)" is not available in Myanmar. Therefore, the results of "Most Probable Number (MPN)" are assumed similar to CFU values and compared with reference values. Once the method to analyze the CFU will be available in Myanmar, the analytical method will be changed.

According to the quality standard for water baths in Japan, (Ministry of Environment, 1997), in case of E.Coli result is exceeding 1,000 CFU/100 ml, since it is assumed unsafety, it is considered unsuitable for water baths.

Source: Myanmar Koei International Ltd.

2.5.2 Results of Reference Monitoring for Comparison with Discharged Points and Baseline of Discharged Creek

Results of water quality monitoring are summarized in Table 2.5-2. The results were compared with the target value of effluent water quality discharging to water body stipulated in the EIA report.

As the comparison with the target value, the results of Suspended Solid (SS), Total Dissolved Solids (TDS) and total coliform exceeded than the target value.

As for the result of SS and TDS, results at the surface water monitoring points (SW-2 and SW-4) exceeded the target value due to two expected reasons; i) delivered from upstream area such as natural origin and wastewater from local industrial zone which outside of Thilawa SEZ, and ii) 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 surface water monitoring points (SW-2 and SW-4) exceeded the target value due to two expected reasons; i) runoff of animal waste from the undeveloped area and delivered from local industrial zone and illegal dumping site from outside of Thilawa SEZ in the upstream area, and ii) delivered from surrounding area by tidal effect.

Table 2.5-2 Result of Water Quality Monitoring for Reference Monitoring Points for Comparison with Discharged Points and Baseline of Discharged Creek

No.	Parameters	Unit	SW-2	SW-4	GW-1	Target Value (Reference Value for Self-Monitoring)
1	Temperature	°C	27	26	30	≤ 35
2	pH	-	8.26	7.73	8.07	6 ~ 9
3	Suspended Solid (SS)	mg/L	82.00	80.00	2.00	50
4	Dissolved Oxygen (DO)	mg/L	6.78	6.76	6.49	-
5	BOD (5)	mg/L	6.44	4.86	2.14	30
6	COD (Cr)	mg/L	70	31.4	5.4	125
7	Total Coliform	MPN/ 100ml	>160000	2100	79	400
8	Total Nitrogen (T-N)	mg/L	4.5	1.7	2.5	80
9	Total Phosphorous (T-P)	mg/L	<0.050	<0.050	0.067	2
10	Color	TCU (True Color Unit)	14.42	3.90	2.14	150
11	Odor	TON (Threshold Odor Number)	1.4	1	1	-
12	Oil and Grease	mg/L	<3.1	<3.1	<3.1	10
13	Total Dissolved Solids	mg/L	4462.00	7034.00	1560.00	2000
14	Iron	mg/L	3.282	2.578	0.502	3.5
15	Mercury	mg/L	≤0.002	≤0.002	≤0.002	0.005
16	Escherichia Coli	MPN/100 ml* (SW)	-	-	-	(1,000)* (CFU/100ml)
		MPN/100 ml** (GW)	-	-	<1.8	(100)** (MPN/100ml)
17	Flow Rate	m^3/s	-	0.383	-	-

Note: Red colors means exceeded value than target value.

*Note: Based on the water utilization at discharged creek, water quality C of the quality standard for water baths in Japan, (Ministry of Environment, 1997) is set as a reference value of self-monitoring for surface water monitoring. However, due to limitation of capacity for analytical laboratory in Myanmar, the method to analyze the "Colony Forming Unit (CFU)" is not available in Myanmar. Therefore, the results of "Most Probable Number (MPN)" are assumed similar to CFU values and compared with reference values. Once the method to analyze the CFU will be available in Myanmar, the analytical method will be changed.

According to the quality standard for water baths in Japan, (Ministry of Environment, 1997), in case of E.Coli result is exceeding 1,000 CFU/100 ml, since it is assumed unsafety, it is considered unsuitable for water baths.

**Note: Based on the water utilization at monitoring point for ground water, B1(Irrigation water) of National Technical Regulation on Surface Water Quality in Vietnam (No. QCVN 08: 2008/BTNMT) is set as a reference value of self-monitoring for ground water monitoring.

Source: Myanmar Koei International Ltd.

CHAPTER 3: CONCLUSION AND RECOMMENDATIONS

As for the result of SS, TDS, total coliform and iron the results at the outlet of the centralized STP (SW-6) complied with the target value. It may prove that effluent from each locator was treated well by the STP. On the other hand, parameters of TDS at retention pond (SW-1) exceeded the target value. It may be due to the soil erosion caused by construction of factories in Zone A and the eroded soil particles may contain soluble components that can dissolve in water. Moreover, the decaying plants and animals in the retention pond may lead to the increase of dissolved solids. The parameters of total coliform at retention pond (SW-1) and retention canal (SW-5) exceeded the target values in this period for main discharged points of Thilawa SEZ Zone A. In addition, according to the result of self-monitoring of E. coli at retention pond (SW-1) and (SW5), result was under the reference value. Therefore, although the target value of total coliform was exceeded at monitoring point SW-1, but it is considered that there is no significant impact on human health.

As for the result of the iron, the result at the monitoring point of retention canal (SW-5) exceeded the target value may be due to the influence of natural origin (iron can reach out from the soil by run-off). Japan set effluent standards for two items as follows; i) health item and ii) living environment item. In the health item, there is no standard value for iron. On the other hand, for the living environment item, the standard value for soluble iron level is 10 mg/l. As the comparison with the living environment standard value in Japan, iron result in SW-5 is lower than the standard value. Therefore, it can be considered that there is no significant impact on the living environment.

As for parameters of SS, TDS and total coliform in surface water exceeded the target values at reference monitoring points (SW-2 and SW-4). The expected reasons for exceeding the target values of SS and TDS are delivered from upstream area such as natural origin and wastewater from local industrial zone which outside of Thilawa SEZ. The expected reasons for exceeding the target values of total coliform are by natural origin (natural bacteria existed). However, it cannot reach to the conclusion of what the reason to be exceeded the target values is, thus the continuous monitoring and yearly trend analysis will be necessary to carry out based on the rainy and dry season data.

As for future subject for main discharged points of Thilawa SEZ Zone A, the following action may be taken to achieve the target levels of SS, TDS, total coliform, iron and appropriate water quality monitoring:

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

End of the Document

APPENDIX-1 FIELD SURVEY PHOTOS

FOR DISCHARGED POINTS OF THILAWA SEZ ZONE A

Surface water sampling and onsite measurement at SW-1

Surface water sampling and onsite measurement at SW-5

Surface water sampling and onsite measurement at SW-6

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

Surface water sampling and onsite measurement at SW-2

Surface water sampling and onsite measurement at SW-4

Ground water sampling and onsite measurement at GW-1

APPENDIX-2 LABORATORY RESULTS

FOR DISCHARGED POINTS AND AFTER CENTRALIZED STP

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-R004E/00
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Report No. : GEM-LAB-201905062
Revision No. : 1
Report Date : 13 May, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.
Project Name : MJTD
Sample Description
Sample Name : MKI-SW-1-0424 Sampling Date : 24 April, 2019
Sample No. : W-1904204 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 24 April, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	18.00	_
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	7.07	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	26.4	0.7
4	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	24000	1.8
5	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	1.9	0
6	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	< 0.050	0.050
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	4.09	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	1	0

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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Analysed By :

Ni Ni Aye Lwin
Supervisor

Approved By :

Hideki Yomo
Managing Director

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED MJTD

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Report No. : GEM-LAB-201905063
Revision No. : 1
Report Date : 13 May, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.
Project Name : MJTD
Sample Description
Sample Name : MKI-SW-5-0424 Sampling Date : 24 April, 2019
Sample No. : W-1904205 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 24 April, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	40.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	8.16	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	26	0.7
4	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	160000	1.8
5	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	2.5	0
6	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.39	0.050
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	6.18	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	1.4	0

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

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Report No. : GEM-LAB-201905064
Revision No. : 1
Report Date : 13 May, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.
Project Name : MJTD
Sample Description

Sample Name : MKI-SW-6-0424 — Sampling Date : 24 April, 2019
Sample No. : W-1904206 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 24 April, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	4.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	0.66	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	17.8	0.7
4	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	< 1.8	1.8
5	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	17.3	0
6	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.639	0.050
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	4.64	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	1.4	0

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

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Report No. : GEM-LAB-201905065
Revision No. : 1
Report Date : 13 May, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.
Project Name : MJTD
Sample Description
Sample Name : MKI-SW-2-0424 Sampling Date : 24 April, 2019
Sample No. : W-1904207 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 24 April, 2019

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	6.44	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	70	0.7
4	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	> 160000	1.8
5	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	4.5	0
6	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	< 0.050	0.050
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	14.42	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	1.4	0
9	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
10	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002

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

Analysed By :

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Report No. : GEM-LAB-201905066
Revision No. : 1
Report Date : 13 May, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.
Project Name : MJTD
Sample Description

Sample Name : MKI-SW-4-0424 — Sampling Date : 24 April, 2019
Sample No. : W-1904208 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 24 April, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	80.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	4.86	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	31.4	0.7
4	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	2100	1.8
5	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	1.7	0
6	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	< 0.050	0.050
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	3.90	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	1	0
9	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
10	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002

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

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Report No. : GEM-LAB-201905067
Revision No. : 1
Report Date : 13 May, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.
Project Name : MJTD
Sample Description

Sample Name : MKI-GW-1-0424
Sample No. : W-1904209
Waste Profile No. : -

Sampling Date : 24 April, 2019
Sampling By : Customer
Sample Received Date : 24 April, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	2.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	2.14	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	5.4	0.7
4	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	79	1.8
5	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	2.5	0
6	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.067	0.050
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	2.14	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	1	0

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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APPENDIX-3 LABORATORY RESULT OF ESCHERICHIA COLI (SELF-MONITORING)

FOR DISCHARGED POINTS AND AFTER CENTRALIZED STP

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Report No. : GEM-LAB-201904212
Revision No. : 2
Report Date : 13 May, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.
Project Name : MJTD
Sample Description
Sample Name : MKI-SW-1-0424 Sampling Date : 24 April, 2019
Sample No. : W-1904191 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 24 April, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	21.0	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

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Report No. : GEM-LAB-201904213
Revision No. : 2
Report Date : 13 May, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)

Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.

Project Name : MJTD

Sample Description

Sample Name : MKI-SW-5-0424 Sampling Date : 24 April, 2019

Sample No. : W-1904192 Sampling By : Customer

Waste Profile No. : - Sample Received Date : 24 April, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	17.0	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

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

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Report No. : GEM-LAB-201904215
Revision No. : 2
Report Date : 13 May, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)

Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.

Project Name : MJTD

Sample Description

Sample Name : MKI-GW-1-0424 — Sampling Date : 24 April, 2019

Sample No. : W-1904194 — Sampling By : Customer

Waste Profile No. : - — Sample Received Date : 24 April, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	< 1.8	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

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Analysed By :

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Managing Director

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APPENDIX-4 LABORATORY RESULTS (SELF-MONITORING)

FOR DISCHARGED POINTS AND AFTER CENTRALIZED STP

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Report No. : GEM-LAB-201905070
Revision No. : 1
Report Date : 13 May, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.
Project Name : MJTD
Sample Description
Sample Name : MKI-SW-1-0424 Sampling Date : 24 April, 2019
Sample No. : W-1904196 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 24 April, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
2	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
3	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.362	0.001
4	TDS	APHA 2540C (Total Dissolved Solids Dried at 180'C)	mg/l	5432.00	_

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

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Report No. : GEM-LAB-201905071
Revision No. : 1
Report Date : 13 May, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.
Project Name : MJTD
Sample Description
Sample Name : MKI-SW-5-0424
Sample No. : W-1904197
Waste Profile No. : -
Sampling Date : 24 April, 2019
Sampling By : Customer
Sample Received Date : 24 April, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
2	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
3	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	6.542	0.001
4	TDS	APHA 2540C (Total Dissolved Solids Dried at 180'C)	mg/l	308.00	_

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

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Report No. : GEM-LAB-201905072
Revision No. : 1
Report Date : 13 May, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.
Project Name : MJTD
Sample Description
Sample Name : MKI-SW-6-0424 Sampling Date : 24 April, 2019
Sample No. : W-1904198 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 24 April, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
2	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
3	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.068	0.001
4	TDS	APHA 2540C (Total Dissolved Solids Dried at 180'C)	mg/l	672.00	-

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

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Report No. : GEM-LAB-201905073
Revision No. : 1
Report Date : 13 May, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)

Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.

Project Name : MJTD

Sample Description

Sample Name : MKI-SW-2-0424 — Sampling Date : 24 April, 2019

Sample No. : W-1904199 — Sampling By : Customer

Waste Profile No. : - — Sample Received Date : 24 April, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
2	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	3.282	0.001
3	TDS	APHA 2540C (Total Dissolved Solids Dried at 180'C)	mg/l	4462.00	-

Remark : LOQ - Limit of Quantitation

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

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Report No. : GEM-LAB-201905074
Revision No. : 1
Report Date : 13 May, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.
Project Name : MJTD
Sample Description
Sample Name : MKI-SW-4-0424 Sampling Date : 24 April, 2019
Sample No. : W-1904200 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 24 April, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
2	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	2.578	0.001
3	TDS	APHA 2540C (Total Dissolved Solids Dried at 180'C)	mg/l	7034.00	-

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

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Report No. : GEM-LAB-201905075
Revision No. : 1
Report Date : 13 May, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)

Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.

Project Name : MJTD

Sample Description

Sample Name : MKI-GW-1-0424 — Sampling Date : 24 April, 2019

Sample No. : W-1904201 — Sampling By : Customer

Waste Profile No. : - — Sample Received Date : 24 April, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
2	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
3	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.502	0.001
4	TDS	APHA 2540C (Total Dissolved Solids Dried at 180'C)	mg/l	1560.00	-

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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Thilawa Special Economic Zone (Zone A)

Development Project (Operation Phase)

Appendix

Water and Waste Water Monitoring Report

June, 2019

WATER QUALITY MONITORING REPORT

FOR DEVELOPMENT OF INDUSTRIAL AREA

IN THILAWA SEZ ZONE A

(OPERATION STAGE)

(Bi-Annually Monitoring)

June 2019

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 A 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-1, SW-2, SW-4, SW-5, SW-6, and GW-1 have been monitored in Thilawa SEZ and its surrounding area in timely manner. Among the six locations, SW-1 and SW-5 are main discharged points of Thilawa SEZ and SW-6 is discharged from centralized Sewage Treatment Plant (STP) which is required to monitor by Environmental Monitoring Plan (EMoP) in EIA report of Thilawa SEZ Zone A. The remaining points SW-2 and SW-4 are sampled as a reference monitoring for comparison with discharged points and baseline of discharged creek. Moreover, GW-1 is monitored as a reference of existing tube well which is located in the monastery compound. Location of sampling points for water quality monitoring is shown in Figure 1.1-1.

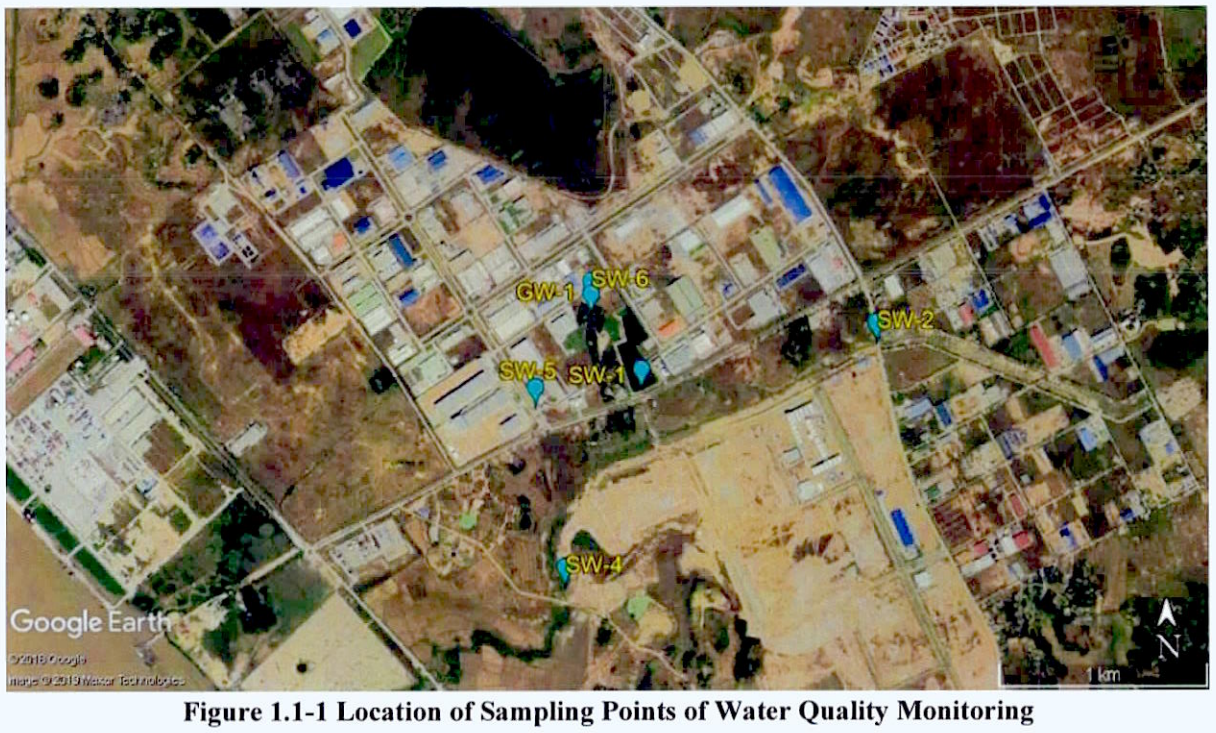


Figure 1.1-1 Location of Sampling Points of Water Quality Monitoring

CHAPTER 2: WATER QUALITY MONITORING

2.1 Monitoring Items

Sampling points and parameters for water quality monitoring are determined so as 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 carried out at four locations (SW-1, SW-4, SW-5 and SW-6) 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-1	SW-2	SW-4	SW-5	SW-6	GW-1	Remarks
1	Temperature	○	○	○	○	○	○	On-site measurement
2	pH	○	○	○	○	○	○	On-site measurement
3	DO	○	○	○	○	○	○	On-site measurement
4	BOD (5)	○	○	○	○	○	○	Laboratory analysis
5	COD (Cr)	○	○	○	○	○	○	Laboratory analysis
6	Total Nitrogen	○	○	○	○	○	○	Laboratory analysis
7	Suspended Solids	○	○	○	○	○	○	Laboratory analysis
8	Total Coliform	○	○	○	○	○	○	Laboratory analysis
9	Total Phosphorous	○	○	○	○	○	○	Laboratory analysis
10	Color	○	○	○	○	○	○	Laboratory analysis
11	Odor	○	○	○	○	○	○	Laboratory analysis
12	Zinc	○	○	○	○	○	○	Laboratory analysis
13	Arsenic	○	○	○	○	○	○	Laboratory analysis
14	Chromium	○	○	○	○	○	○	Laboratory analysis
15	Cadmium	○	○	○	○	○	○	Laboratory analysis
16	Selenium	○	○	○	○	○	○	Laboratory analysis
17	Lead	○	○	○	○	○	○	Laboratory analysis
18	Copper	○	○	○	○	○	○	Laboratory analysis
19	Barium	○	○	○	○	○	○	Laboratory analysis
20	Nickel	○	○	○	○	○	○	Laboratory analysis
21	Cyanide	○	○	○	○	○	○	Laboratory analysis
22	Total Cyanide	○	○	○	○	○	○	Laboratory analysis
23	Free Chlorine	○	○	○	○	○	○	Laboratory analysis
24	Sulphide	○	○	○	○	○	○	Laboratory analysis
25	Formaldehyde	○	○	○	○	○	○	Laboratory analysis
26	Phenols	○	○	○	○	○	○	Laboratory analysis
27	Total Residual Chlorine	○	○	○	○	○	○	Laboratory analysis
28	Chromium (Hexavalent)	○	○	○	○	○	○	Laboratory analysis
29	Ammonia	○	○	○	○	○	○	Laboratory analysis
30	Fluoride	○	○	○	○	○	○	Laboratory analysis
31	Silver	○	○	○	○	○	○	Laboratory analysis
32	Oil and Grease	○	○	○	○	○	○	Laboratory analysis
33	Total Dissolved Solids	○	○	○	○	○	○	Laboratory analysis
34	Iron	○	○	○	○	○	○	Laboratory analysis
35	Mercury	○	○	○	○	○	○	Laboratory analysis
36	Escherichia Coli (Self- monitoring)	○	○	○	○	○	○	Laboratory analysis
37	Flow Rate	○	-	○	○	○	-	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-1	**Coordinate** - N - 16° 40' 13.5", E - 96° 16' 39.8"
		Location - Outlet of Retention Pond
		Survey Item – Surface water sampling and water flow rate measurement.
2	SW-2	**Coordinate** - N - 16° 40' 20.69", E - 96° 17' 18.04"
		Location - Upstream of Shwe Pyauk Creek
		Survey Item – Surface water sampling.
3	SW-4	**Coordinate**- N - 16° 39' 42.84", E - 96° 16' 27.42"
		Location - Downstream of Shwe Pyauk Creek
		Survey Item – Surface water sampling and water flow rate measurement.
4	SW-5	**Coordinate**- N - 16° 40' 10.7", E - 96° 16' 22.6"
		Location - Outlet of Retention Canal
		Survey Item – Surface water sampling and water flow rate measurement.
5	SW-6	**Coordinate**- N - 16° 40' 27.13", E - 96° 16' 30.68"
		Location - Outlet from STP to Retention Pond
		Survey Item – Surface water sampling and water flow rate measurement.
6	GW-1	**Coordinate**- N - 16° 40' 25.10", E - 96° 16' 31.70"
		Location - In Moegyoe Swan Monastery
		Survey Item – Ground Water Sampling.

Source: Myanmar Koei International Ltd.

SW-1

SW-1 was collected at the discharge point of retention pond which is located in the east of Moegyoe Swan monastery. The distance is about 530 m downstream of SW-6. This drainage is flowing from north to south and then connected to the Shwe Pyauk creek through earth drain. The water quality of this monitoring point has been influenced by the water from downstream due to flow back by tidal fluctuation. In addition, it seems that a part of wastewater from monastery has reached to the culvert in the SEZ area and discharging to the retention pond.

SW-2 (Reference Point)

SW-2 was collected at the upstream of Shwe Pyauk creek. This sampling point is located in the southeast of Zone A area and at the south of Dagon-Thilawa road. The surrounding areas are Zone B in the southwest and local industrial zone in the east respectively.

SW-4 (Reference Point)

SW-4 was collected at the downstream of Shwe Pyauk creek, after mixing of discharge 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 2.15 km downstream of SW-2. This sampling point is located in the southwest of Zone A area and in the south of Dagon-Thilawa road. The surrounding areas are Zone B and local industrial zone in the east respectively.

SW-5

SW-5 was collected at retention canal near main gate of Thilawa SEZ. Most of the water collected in this canal is rain water and domestic wastewater from surrounding. This canal is also connected to the Shwe Pyauk creek. The water quality of this monitoring point may have been influenced by the water from downstream due to flow back by tidal fluctuation.

SW-6

SW-6 was collected at the drain outlet of centralized STP which is located in the north of Moegyoe Swan monastery compound and retention pond (SW-1). Then the treated water is flowing to the retention pond. The distance is about 530 m upstream of SW-1.

GW-1 (Reference of Existing Tube Well)

GW-1 was collected from tube well as ground water sample. It is located in the compound of Moegyoe Swan monastery. The surrounding areas are Zone A in the west, retention pond in the east and Dagon-Thilawa road in the south respectively.

2.3 Monitoring Method

All water samples were collected with cleaned sampling bottles 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	Suspended Solids (SS)	APHA 2540 D (Dry at 103-105°C Method)
4	Dissolved Oxygen (DO)	Instrument Analysis Method (Horiba, U-52, Multi Water Quality Checker)
5	BOD (5)	APHA 5210 B (5 Days BOD Test)
6	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)
7	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)
8	Total Nitrogen (T-N)	HACH Method 10072(TNT Persulfate Digestion Method)
9	Total Phosphorous (T-P)	APHA 4500-P E (Ascorbic Acid Method)
10	Color	APHA 2120C (Spectrophotometric Method)
11	Odor	APHA 2150 B (Threshold Odor Test)
12	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)
13	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
14	Zinc	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
15	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
16	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
17	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
18	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
19	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
20	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
21	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
22	Nickel	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
23	Cyanide	HACH 8027 (Pyridine-Pyrazalone Method)
24	Total Cyanide	Distillation process: APHA 4500-CN-C. Total Cyanide after Distillation, Determine cyanide Concentration Process: HACH 8027 (Pyridine – Pyrazalone Method)
25	Free Chlorine	APHA 4500-CL G (DPD Colorimetric Method)
26	Sulphide	HACH 8131 (USEPA Methylene Blue Method)
27	Formaldehyde	HACH 8110 (MBTH Method)
28	Phenols	USEPA Method 420.1 (Phenolics (Spectrophotometric, Manual 4 AAP With Distillation))
29	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
30	Total Dissolved Solids	APHA 2540 C (Total Dissolved Solids Dried at 180°C Method)
31	Total Residual Chlorine	APHA 4500-CL G (DPD Colorimetric Method)
32	Chromium (Hexavalent)	ISO 11083:1994 (Determination of chromium (VI) Spectrometric method using 1,5-diphenylcarbazide)
33	Ammonia	HACH Method 10205 (Silicylate TNT Plus Method)
34	Fluoride	APHA 4110 B (Ion Chromatography with Chemical Suppression of Eluent Conductivity)
35	Silver	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
36	Escherichia Coli	APHA 9221 F (Escherichia Coli Procedure Using Fluorogenic Substrate)
37	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 conducted on 05 June 2019 and sampling time is shown in Table 2.4-1 to avoid tidal effect. The tide record for Yangon River, Myanmar on 05 June 2019 is shown in Table 2.4-2

Table 2.4-1 Sampling Time of Each Station

No.	Station	Sampling Time
1	SW-1	05/06/2019 10:42
2	SW-2	05/06/2019 08:51
3	SW-4	05/06/2019 11:41
4	SW-5	05/06/2019 11:07
5	SW-6	05/06/2019 10:18
6	GW-1	05/06/2019 15:17

Source: Myanmar Koei International Ltd.

Table 2.4-2 Tide Record for Yangon River, Myanmar

Date	Time	Height	Tide Conditions
05/06/2019	01:09	0.81	Low Tide
	05:31	5.64	High Tide
	12:54	0.86	Low Tide
	17:39	6.18	High Tide

Source: Myanmar Port Authority, Tide Table for the Yangon River and Elephant Point, 2019.

2.5 Monitoring Results

Results of water quality monitoring are summarized in Table 2.5-1. Analytical results of the laboratory are described in Appendix-2 and Appendix-3. 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 Water Quality at the Outlet of Sewage Treatment Plant of Industrial Area of Thilawa SEZ and at the Point before Discharging to Creek

As the comparison with the target value, the results of suspended solids (SS), total coliform, iron and total residual chlorine exceeded than the target values.

As for the result of SS, the result at the outlet of the centralized STP (SW-6) complied with the target value. It implied that effluents from each locator was treated well by the STP. On the other hand, results at the monitoring points of retention pond (SW-1) and retention canal (SW-5) before discharging to creek, exceeded the target value due to the expected reason; for SW-1 and SW-5: surface water run-off from bare land in Zone A.

As for the result of total coliform of surface water, the result at the outlet of the centralized STP (SW-6) complied with the target value. It may prove that effluents from each locator was treated well by the STP. On the other hand, results at monitoring points of retention pond (SW-1) and retention canal (SW-5) exceeded the target value due to the expected reason; the potential expected reason might be natural bacteria existed in all area of Zone A because there are various kinds of vegetation and creature such as birds, and small animals in and along the retention canals and retention ponds.

Since the composition of the total coliform include bacteria from natural origin, and even after total coliform do not affect human health directly, self-monitoring for E. Coli analysis was carried out to identify health impact by coliform bacteria. As for the result of E.Coli of surface water, all of results were under the reference value. Therefore, although the target value of total coliform exceeded at monitoring point of retention pond (SW-1) and retention canal (SW-5), but it is considered that there is no significant impact on human health.

As for the result of the iron, the result at the outlet of the centralized STP (SW-6) complied with the target value. It implied that effluents from each locator was treated well by the STP. On the other hand, the result at the monitoring point of retention pond (SW-1) exceeded the target value may be due to the influence of natural origin (iron can reach out from the soil by run-off). Japan set effluent standards for two items as follows; i) health item and ii) living environment item. In the health item, there is no standard value for iron. On the other hand, for the living environment item, the standard value for soluble iron level is 10 mg/l. As the comparison with the living environment standard value in Japan, iron result in SW-1 is lower than the standard value. Therefore, it can be considered that there is no significant impact on the living environment.

As for the result of total residual chlorine, the result at the outlet of the centralized STP (SW-6) is 0.3 mg/l and is slightly higher than the target value. A possible reason for exceeding the target value is because of the chlorine remaining in the wastewater before discharged. According to the World Health Organization (WHO), the optimum chlorine residual in communal water supply is in the range of 0.2 to 0.5 mg/l, therefore, the result at (SW-6) is within WHO range. Moreover, the result of total residual chlorine at (SW-1) which is one of the final discharge points of Zone A is less than 0.1 mg/l. Therefore, it can be considered that there is no significant impact on the human health and living environment.

On the bases of the above examinations, the following actions shall be taken to monitor the impact on human health;

- To continue the self-monitoring for Escherichia coli (E. Coli) level to identify health impact by coliform bacteria (While result of Total coliform exceeded the target value)

Perhaps, the possibility that water flowing through the retention canals might include overflowed water from some construction sites with insufficient treatment of coliform should not be excluded from the possible cause.

Table 2.5-1 Results of Water Quality Monitoring on All Discharges and Gates

No.	Parameters	Unit	SW-1	SW-5	SW-6	Target Value (Reference Value for Self-Monitoring)
1	Temperature	˚C	30	31	30	≤ 35
2	pH	-	8.7	9.0	6.9	6~9
3	Suspended Solid (SS)	mg/L	182.00	70.00	2.00	50
4	Dissolved Oxygen (DO)	mg/L	6.67	9.19	5.19	-
5	BOD (5)	mg/L	9.20	9.41	2.92	30
6	COD (Cr)	mg/L	30.6	38.4	14	125
7	Total Coliform	MPN/ 100ml	11000	92000	< 1.8	400
8	Total Nitrogen (T-N)	mg/L	3.5	2.1	9.3	80
9	Total Phosphorous (T-P)	mg/L	0.342	0.189	0.356	2
10	Color	TCU (True Color Unit)	2.47	6.91	0.62	150
11	Odor	TON (Threshold Odor Number)	1	1	1	-
12	Oil and Grease	mg/L	< 3.1	< 3.1	< 3.1	10
13	Mercury	mg/L	≤ 0.002	≤ 0.002	≤ 0.002	0.005
14	Zinc	mg/L	≤ 0.002	≤ 0.002	0.038	2
15	Arsenic	mg/L	0.01	≤ 0.01	≤ 0.01	0.1
16	Chromium	mg/L	0.02	0.01	≤ 0.002	0.5
17	Cadmium	mg/L	≤ 0.002	≤ 0.002	≤ 0.002	0.03
18	Selenium	mg/L	≤ 0.01	≤ 0.01	≤ 0.01	0.02
19	Lead	mg/L	≤ 0.002	≤ 0.002	≤ 0.002	0.1
20	Copper	mg/L	0.003	0.004	≤ 0.002	0.5
21	Barium	mg/L	0.032	0.036	0.006	1
22	Nickel	mg/L	0.026	0.012	0.008	0.2
23	Cyanide	mg/L	< 0.002	< 0.002	< 0.002	0.1
24	Total Cyanide	mg/L	0.003	0.002	0.009	1
25	Free Chlorine	mg/L	< 0.1	< 0.1	0.2	1
26	Sulphide	mg/L	0.157	0.092	< 0.005	1
27	Formaldehyde	mg/L	0.115	0.128	0.040	1
28	Phenols	mg/L	0.052	0.032	< 0.002	0.5
29	Iron	mg/L	9.098	3.336	0.060	3.5
30	Total Dissolved Solids	mg/L	1046	214	490	2000
31	Total Residual Chlorine	mg/L	< 0.1	0.1	0.3	0.2
32	Chromium (Hexavalent)	mg/L	< 0.05	< 0.05	< 0.05	0.1
33	Ammonia	mg/L	0.066	0.280	0.267	10
34	Fluoride	mg/L	0.620	0.206	1.653	20
35	Silver	mg/L	0.334	0.196	≤ 0.002	0.5
36	Escherichia Coli	MPN/100ml (SW)	12.0	3.6	-	(1000)* (CFU/100ml)
37	Flow Rate	m^3/s	0.036	0.056	0.008	-

Note: Red color means exceeded value than target value.

*Note: Based on the water utilization at discharged creek, water quality C of quality standard for water baths in Japan, (Ministry of Environment, 1997) is set as a reference value for self-monitoring of E. coli for surface water monitoring. However, due to limitation of capacity for analytical laboratory in Myanmar, the method to analyze the "Colony Forming Unit (CFU)" is not available in Myanmar. Therefore, the results of "Most Probable Number (MPN)" are assumed similar to CFU values and compared with reference values. Once the method to analyze the CFU will be available in Myanmar, the analytical method will be changed.

According to the quality standard for water baths in Japan, (Ministry of Environment, 1997), in case of E.Coli result is exceeding 1,000 CFU/100 ml, since it is assumed unsafety, it is considered unsuitable for water baths.

Source: Myanmar Koei International Ltd.

2.5.2 Results of Reference Monitoring for Comparison with Discharged Points and Baseline of Discharged Creek

Results of water quality monitoring are summarized in Table 2.5-2. The results were compared with the target value of effluent water quality discharging to water body stipulated in the EIA report.

As the comparison with the target value, the results of Suspended Solid (SS), total coliform and iron exceeded than the target value.

As for the result of SS, results at the surface water monitoring point (SW-4) exceeded the target value due to two expected reasons; i) delivered from upstream area such as natural origin and wastewater from local industrial zone which outside of Thilawa SEZ, and ii) 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 surface water monitoring points (SW-2 and SW-4) exceeded the target value due to two expected reasons; i) runoff of animal waste from the undeveloped area and delivered from local industrial zone and illegal dumping site from outside of Thilawa SEZ in the upstream area, and ii) delivered from surrounding area by tidal effect. The result of total coliform at the reference of existing tube well (GW-1) also exceeded the target value. It may be possible due to expected reasons i) the poor maintenance of well which can increase the risk of bacteria and other harmful organisms ii) the well was not operated regularly and didn't use by the local people for a long time. In addition to the result of E. Coli of surface water and ground water, all of the result was under the reference value. Therefore, although the target value of total coliform was exceeded at monitoring point of SW-2, SW-4 and GW-1, it is considered that there is no significant impact on human health.

As for the result of iron, the result at the monitoring point of surface water monitoring point (SW-4) exceeded the target value may be due to the influence of natural origin (iron can reach out from the soil by run-off). Japan set effluent standards for two items as follows; i) health item and ii) living environment item. In the health item, there is no standard value for iron. On the other hand, for the living environment item, the standard value for soluble iron level is 10 mg/l. As the comparison with the living environment standard value in Japan, iron result in SW-4 is lower than the standard value. Therefore, it can be considered that there is no significant impact on the living environment.

Table 2.5-2 Result of Water Quality Survey for Reference Monitoring Points for Comparison with Discharging Points and Baseline of Discharged Creek

No.	Parameters	Unit	SW-2	SW-4	GW-1	Target Value (Reference Value for Self-Monitoring)
1	Temperature	˚C	29	30	32	≤ 35
2	pH	-	7.5	7.9	8.1	6~9
3	Suspended Solid (SS)	mg/L	10.00	82.00	2.00	50
4	Dissolved Oxygen (DO)	mg/L	3.03	7.05	6.85	-
5	BOD (5)	mg/L	6.96	8.32	5.42	30
6	COD (Cr)	mg/L	65	18.3	6.9	125
7	Total Coliform	MPN/ 100ml	35000	54000	920	400
8	Total Nitrogen (T-N)	mg/L	1.2	1.7	2	80
9	Total Phosphorous (T-P)	mg/L	0.174	0.205	< 0.05	2
10	Color	TCU (True Color Unit)	22.12	6.22	0.28	150
11	Odor	TON (Threshold Odor Number)	1	1	1	-
12	Oil and Grease	mg/L	< 3.1	< 3.1	< 3.1	10
13	Mercury	mg/L	≤ 0.002	≤ 0.002	≤ 0.002	0.005
14	Zinc	mg/L	≤ 0.002	0.066	0.034	2
15	Arsenic	mg/L	≤ 0.01	0.01	≤ 0.01	0.1
16	Chromium	mg/L	0.004	0.018	≤ 0.002	0.5
17	Cadmium	mg/L	≤ 0.002	≤ 0.002	≤ 0.002	0.03
18	Selenium	mg/L	≤ 0.01	≤ 0.01	≤ 0.01	0.02
19	Lead	mg/L	≤ 0.002	≤ 0.002	≤ 0.002	0.1
20	Copper	mg/L	≤ 0.002	≤ 0.002	≤ 0.002	0.5
21	Barium	mg/L	0.034	0.036	0.102	1
22	Nickel	mg/L	0.004	0.018	≤ 0.002	0.2
23	Cyanide	mg/L	< 0.002	< 0.002	< 0.002	0.1
24	Total Cyanide	Mg/L	0.002	0.003	0.002	1
25	Free Chlorine	mg/L	0.1	0.1	< 0.1	1
26	Sulphide	mg/L	0.011	0.150	< 0.005	1
27	Formaldehyde	mg/L	0.128	0.126	0.069	1
28	Phenols	mg/L	0.004	< 0.002	< 0.002	0.5
29	Iron	mg/L	2.862	5.920	0.654	3.5
30	Total Dissolved Solids	mg/L	222	764	1556	2000
31	Total Residual Chlorine	mg/L	0.1	0.1	0.1	0.2
32	Chromium (Hexavalent)	mg/L	< 0.05	< 0.05	< 0.05	0.1
33	Ammonia	mg/L	0.490	0.260	2.160	10
34	Fluoride	mg/L	0.099	0.216	0.022	20
35	Silver	mg/L	0.042	0.24	≤ 0.002	0.5
36	Escherichia Coli	MPN/100ml* (SW)	-	-	-	(1,000)* (CFU/100ml)
		MPN/100ml** (GW)	-	-	2.0	(100)** (MPN/100ml)
37	Flow Rate	m^3/s	-	0.223	-	-

Note: Red color means the exceeded results than target value.

*Note: Based on the water utilization at discharged creek, water quality C of quality standard for water baths in Japan, (Ministry of Environment, 1997) is set as a reference value of self-monitoring for surface water monitoring. However, due to limitation of capacity for analytical laboratory in Myanmar, the method to analyze the "Colony Forming Unit (CFU)" is not available in Myanmar. Therefore, the results of "Most Probable Number (MPN)" are assumed similar to CFU values and compared with reference values. Once the method to analyze the CFU will be available in Myanmar, the analytical method will be changed.

According to the quality standard for water baths in Japan, (Ministry of Environment, 1997), in case of E.Coli result is exceeding 1,000 CFU/100 ml, since it is assumed unsafety, it is considered unsuitable for water baths.

**Note: Based on the water utilization at monitoring point for ground water, B1(Irrigation water) of National Technical Regulation on Surface Water Quality in Vietnam (No. QCVN 08: 2008/BTNMT) is set as a reference value of self-monitoring for ground water monitoring.

Source: Myanmar Koei International Ltd.

CHAPTER 3: CONCLUSION AND RECOMMENDATIONS

As for the result of SS, total coliform and iron at the outlet of the centralized STP (SW-6) complied with the target value. It may prove that effluent from each locator was treated well by the STP. On the other hand, the parameters of SS, results at the monitoring points of retention pond (SW-1) and retention canal (SW-5) before discharging to creek, exceeded the target value due to the expected reason; for SW-1 and SW-5: surface water run-off from bare land in Zone A.

Moreover, the parameters of total coliform at retention pond (SW-1) and retention canal (SW-5) exceeded the target values in this period for main discharged points of Thilawa SEZ Zone A. In addition, according to the result of self-monitoring of E. coli at retention pond (SW-1) and (SW5), result was under the reference value. Therefore, although the target value of total coliform was exceeded at monitoring point (SW-1) and (SW-5), but it is considered that there is no significant impact on human health.

As for the result of the iron, the result at the monitoring point of retention pond (SW-1) exceeded the target value may be due to the influence of natural origin (iron can reach out from the soil by run-off). Japan set effluent standards for two items as follows; i) health item and ii) living environment item. In the health item, there is no standard value for iron. On the other hand, for the living environment item, the standard value for soluble iron level is 10 mg/l. As the comparison with the living environment standard value in Japan, iron result in SW-1 is lower than the standard value. Therefore, it can be considered that there is no significant impact on the living environment.

As for the result of total residual chlorine, the result at the outlet of the centralized STP (SW-6) is 0.3 mg/l and is slightly higher than the target value. A possible reason for exceeding the target value is because of the chlorine remaining in the wastewater before discharged. According to the World Health Organization (WHO), the optimum chlorine residual in communal water supply is in the range of 0.2 to 0.5 mg/l, therefore, the result at (SW-6) is within WHO range. Moreover, the treated water from STP (SW-6) flows into (SW-1) which is one of the final discharge points of Zone A and the result of total residual chlorine at (SW-1) is less than 0.1 mg/l. Therefore, it can be considered that there is no significant impact on the human health and living environment.

As for parameters of SS, total coliform and iron in surface water exceeded the target values at reference monitoring points. The expected reasons for exceeding the target value of SS at (SW-2) are delivered from upstream area such as natural origin and wastewater from local industrial zone which is outside of Thilawa SEZ.

The expected reasons for exceeding the target values of total coliform at (SW-2 and SW-4) are by natural origin (natural bacteria existed).

The expected reasons for exceeding the target value of total coliform at reference point of existing tube well (GW-1) are poor maintenance of well, not operated regularly, not used by local people. It will be recommended to test the tube well for total coliform every year. As mentioned in Section 2.5-2, the result of self-monitoring of E-coli at GW-1 was under the reference value. Therefore, it is considered that there is no significant impact on human health.

The expected reasons for exceeding the target value of iron at SW-4 maybe due to the influence of natural origin. Japan set effluent standards for two items as follows; i) health item and ii) living environment item. In the health item, there is no standard value for iron. On the other hand, for the living environment item, the standard value for soluble iron level is 10 mg/l. As the comparison with the living environment standard value in Japan, iron result in SW-4 is lower than the standard value. Therefore, it can be considered that there is no significant impact on the living environment.

As for future subject for main discharged points of Thilawa SEZ Zone A, the following action may be taken to achieve the target levels of SS, total coliform, iron, total residual chlorine and appropriate water quality monitoring:
- To continue monitoring Escherichia coli (E. coli) level to identify health impact by coliform bacteria; and
- To monitor the possibility of the overflow water from construction sites.

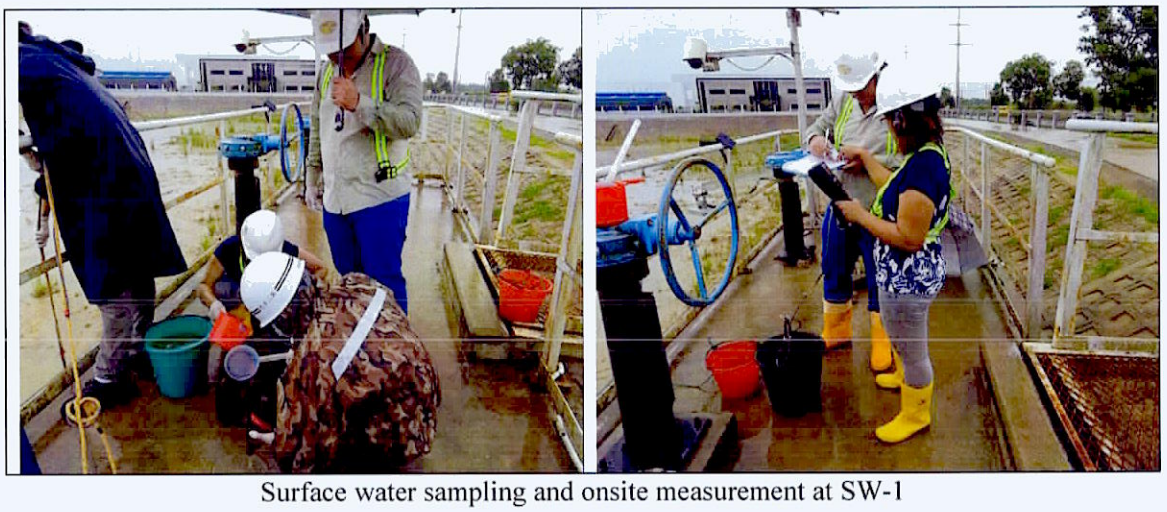
- To monitor the possibility of the domestic wastewater from construction sites.

End of the Document

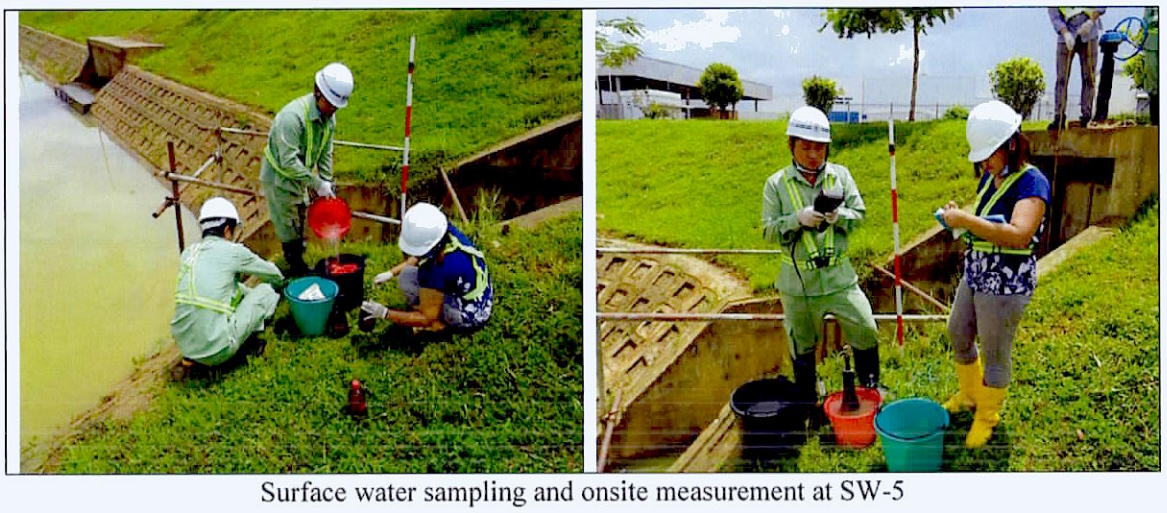
MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED
MJTD

APPENDIX-1 FIELD SURVEY PHOTOS

FOR DISCHARGED POINTS OF THILAWA SEZ ZONE A



Surface water sampling and onsite measurement at SW-1



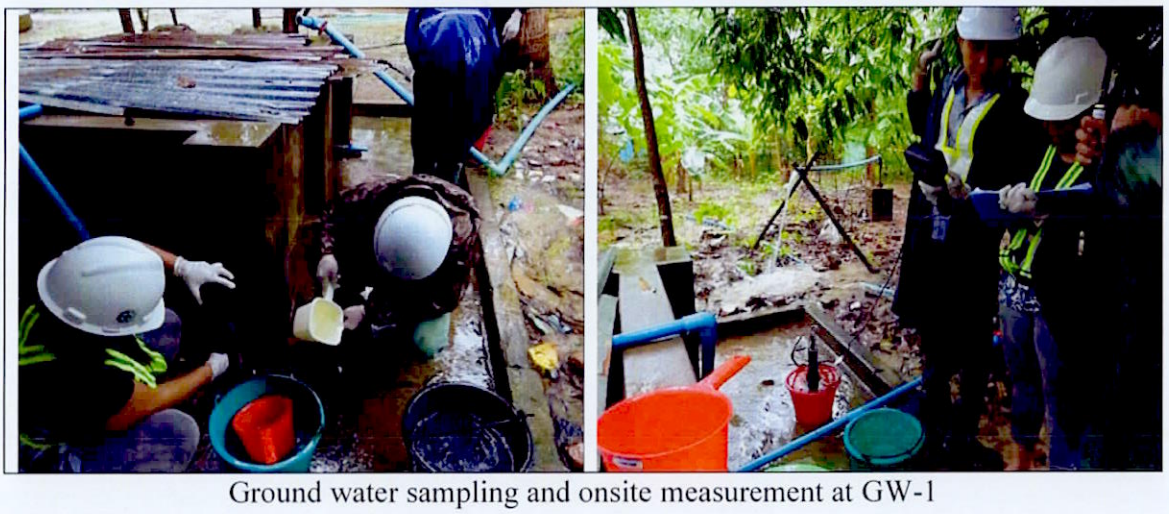
Surface water sampling and onsite measurement at SW-5

Surface water sampling and onsite measurement at SW-6

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

Surface water sampling and onsite measurement at SW-2

Surface water sampling and onsite measurement at SW-4



Ground water sampling and onsite measurement at GW-1

APPENDIX-2 LABORATORY RESULTS

FOR DISCHARGED POINTS AND AFTER CENTRALIZED STP

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Doc No: GEM-LB-R004E/00
Page1of1

Report No. : GEM-LAB-201906148
Revision No. : 1
Report Date : 20 June, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.
Project Name : MJTD
Sample Description
Sample Name : MKI-SW-1-0605 — Sampling Date : 5 June, 2019
Sample No. : W-1906081 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 5 June, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105°C Method)	mg/l	182.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	9.20	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	30.6	0.7
4	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	11000	1.8
5	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
6	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	3.5	0
7	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.342	0.050
8	Color	APHA 2120C (Spectrophotometric Method)	TCU	2.47	0.00
9	Odor	APHA 2150 B (Threshold Odor Test)	TON	1	0
10	TDS	APHA 2540 C (Total Dissolved Solids Dried at 180°C Method)	mg/l	1046	-
11	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
12	Zinc	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
13	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.01	0.01
14	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.02	0.002
15	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
16	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.01	0.01
17	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
18	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.003	0.002
19	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.032	0.001
20	Nickel	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.026	0.002
21	Silver	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.334	0.002
22	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	9.098	0.002
23	Cyanide	HACH 8027 (Pyridine -Pyrazalone Method	mg/l	< 0.002	0.002
24	Total Cyanide	Distillation Process:APHA 4500-CN- C. Total Cyanide after Distillation, Determine Cyanide Concentration Process: HACH 8027 (Pyridine -Pyrazalone Method)	mg/l	0.003	0.002
25	Ammonia	HACH Method 10205 (Silicylate TNT Plus Method)	mg/l	0.066	0.020
26	Hexavalent Chromium (Cr6+)	ISO 11083:1994 (Determination of chromium(VI) Spectrometric method using 1,5-diphenylcarbazide)	mg/l	< 0.05	0.05
27	Fluoride	APHA 4110 B (Ion Chromatography with Chemical Suppression of Eluent Conductivity)	mg/l	0.620	0.014
28	Total Residual Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	< 0.1	0.1
29	Free Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	< 0.1	0.1
30	Sulphide	HACH 8131 (USEPA Methylene Blue Method)	mg/l	0.157	0.005
31	Formaldehyde	HACH 8110 (MBTH Method)	mg/l	0.115	0.003
32	Phenols	USEPA Method 420.1 (Phenolics (Spectrophotometric, Manual 4AAP With Distillation))	mg/l	0.052	0.002

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

Analysed By :

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Supervisor

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June 20, 2019
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Approved By :

Tomoya Suzuki
Director June 20, 2019

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Report No. : GEM-LAB-201906149
Revision No. : 1
Report Date : 20 June, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.
Project Name : MJTD
Sample Description
Sample Name : MKI-SW-5-0605 — Sampling Date : 5 June, 2019
Sample No. : W-1906082 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 5 June, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	70.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	9.41	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	38.4	0.7
4	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	92000	1.8
5	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
6	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	2.1	0
7	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.189	0.050
8	Color	APHA 2120C (Spectrophotometric Method)	TCU	6.91	0.00
9	Odor	APHA 2150 B (Threshold Odor Test)	TON	1	0
10	TDS	APHA 2540 C (Total Dissolved Solids Dried at 180'C Method)	mg/l	214	-
11	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
12	Zinc	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
13	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.01	0.01
14	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.01	0.002
15	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
16	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.01	0.01
17	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
18	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.004	0.002
19	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.036	0.001
20	Nickel	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.012	0.002
21	Silver	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.196	0.002
22	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	3.336	0.002
23	Cyanide	HACH 8027 (Pyridine -Pyrazalone Method	mg/l	< 0.002	0.002
24	Total Cyanide	Distillation Process: APHA 4500-CN- C. Total Cyanide after Distillation, Determine Cyanide Concentration Process: HACH 8027 (Pyridine -Pyrazalone Method)	mg/l	0.002	0.002
25	Ammonia	HACH Method 10205 (Silicylate TNT Plus Method)	mg/l	0.280	0.020
26	Hexavalent Chromium (Cr6+)	ISO 11083:1994 (Determination of chromium(VI) Spectrometric method using 1,5-diphenylcarbazide)	mg/l	< 0.05	0.05
27	Fluoride	APHA 4110 B (Ion Chromatography with Chemical Suppression of Eluent Conductivity)	mg/l	0.206	0.014
28	Total Residual Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	0.1	0.1
29	Free Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	< 0.1	0.1
30	Sulphide	HACH 8131 (USEPA Methylene Blue Method)	mg/l	0.092	0.005
31	Formaldehyde	HACH 8110 (MBTH Method)	mg/l	0.128	0.003
32	Phenols	USEPA Method 420.1 (Phenolics (Spectrophotometric, Manual 4AAP With Distillation))	mg/l	0.032	0.002

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

Analysed By :
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LAB June 20. 2019 GEM

Approved By :
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Director June 20. 2019

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Doc No: GEM-LB-R004E/00
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Report No. : GEM-LAB-201906150
Revision No. : 1
Report Date : 20 June, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.
Project Name : MJTD
Sample Description
Sample Name : MKI-SW-6-0605 Sampling Date : 5 June, 2019
Sample No. : W-1906083 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 5 June, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	2.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	2.92	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	14	0.7
4	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	< 1.8	1.8
5	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
6	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	9.3	0
7	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.356	0.050
8	Color	APHA 2120C (Spectrophotometric Method)	TCU	0.62	0.00
9	Odor	APHA 2150 B (Threshold Odor Test)	TON	1	0
10	TDS	APHA 2540 C (Total Dissolved Solids Dried at 180'C Method)	mg/l	490	-
11	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
12	Zinc	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.038	0.002
13	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.01	0.01
14	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
15	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
16	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.01	0.01
17	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
18	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
19	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.006	0.001
20	Nickel	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.008	0.002
21	Silver	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
22	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.060	0.002
23	Cyanide	HACH 8027 (Pyridine -Pyrazalone Method	mg/l	< 0.002	0.002
24	Total Cyanide	Distillation Process:APHA 4500-CN- C. Total Cyanide after Distillation, Determine Cyanide Concentration Process: HACH 8027 (Pyridine -Pyrazalone Method)	mg/l	0.009	0.002
25	Ammonia	HACH Method 10205 (Salicylate TNT Plus Method)	mg/l	0.267	0.020
26	Hexavalent Chromium (Cr6+)	ISO 11083.1994 (Determination of chromium(VI) Spectrometric method using 1,5-diphenylcarbazide)	mg/l	< 0.05	0.05
27	Fluoride	APHA 4110 B (Ion Chromatography with Chemical Suppression of Eluent Conductivity)	mg/l	1.653	0.014
28	Total Residual Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	0.3	0.1
29	Free Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	0.2	0.1
30	Sulphide	HACH 8131 (USEPA Methylene Blue Method)	mg/l	< 0.005	0.005
31	Formaldehyde	HACH 8110 (MBTH Method)	mg/l	0.040	0.003
32	Phenols	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, AWWA - American Water Works Association (AWWA), and the Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 22nd edition

LAB
June 20, 2019
GEM

Analysed By :
Ni Ni Aye Lwin
Supervisor

Approved By :
Tomoya Suzuki
Director June 20, 2019

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED
MJTD

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

DOWA

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Report No. : GEM-LAB-20190615 1
Revision No. : 1
Report Date : 20 June, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.
Project Name : MJTD
Sample Description
Sample Name : MKI-SW-2-0605 — Sampling Date : 5 June, 2019
Sample No. : W-1906084 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 5 June, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	10.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	6.96	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	65	0.7
4	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	35000	1.8
5	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
6	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	1.2	0
7	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.174	0.050
8	Color	APHA 2120C (Spectrophotometric Method)	TCU	22.12	0.00
9	Odor	APHA 2150 B (Threshold Odor Test)	TON	1	0
10	TDS	APHA 2540 C (Total Dissolved Solids Dried at 180°C Method)	mg/l	222	-
11	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
12	Zinc	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
13	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.01	0.01
14	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.004	0.002
15	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
16	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.01	0.01
17	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
18	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
19	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.034	0.001
20	Nickel	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.004	0.002
21	Silver	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.042	0.002
22	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	2.862	0.002
23	Cyanide	HACH 8027 (Pyridine -Pyrazalone Method	mg/l	< 0.002	0.002
24	Total Cyanide	Distillation Process:APHA 4500-CN- C. Total Cyanide after Distillation, Determine Cyanide Concentration Process: HACH 8027 (Pyridine -Pyrazalone Method)	mg/l	0.002	0.002
25	Ammonia	HACH Method 10205 (Salicylate TNT Plus Method)	mg/l	0.490	0.020
26	Hexavalent Chromium (Cr6+)	ISO 11083:1994 (Determination of chromium(VI) Spectrometric method using 1,5-diphenylcarbazide)	mg/l	< 0.05	0.05
27	Fluoride	APHA 4110 B (Ion Chromatography with Chemical Suppression of Eluent Conductivity)	mg/l	0.099	0.014
28	Total Residual Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	0.1	0.1
29	Free Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	0.1	0.1
30	Sulphide	HACH 8131 (USEPA Methylene Blue Method)	mg/l	0.011	0.005
31	Formaldehyde	HACH 8110 (MBTH Method)	mg/l	0.128	0.003
32	Phenols	USEPA Method 420 1 (Phenolics (Spectrophotometric, Manual 4AAP With Distillation))	mg/l	0.004	0.002

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

Analysed By :
Ni Ni Aye Lwin
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June 20, 2019
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Approved By :
Tomoya Suzuki
Director June 20, 2019

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED
MJTD

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

Report No. : GEM-LAB-201906152
Revision No. : 1
Report Date : 20 June, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.
Project Name : MJTD
Sample Description
Sample Name : MKI-SW-4-0605 — Sampling Date : 5 June, 2019
Sample No. : W-1906085 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 5 June, 2019

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	8.32	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	18.3	0.7
4	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	54000	1.8
5	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
6	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	1.7	0
7	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.205	0.050
8	Color	APHA 2120C (Spectrophotometric Method)	TCU	6.22	0.00
9	Odor	APHA 2150 B (Threshold Odor Test)	TON	1	0
10	TDS	APHA 2540 C (Total Dissolved Solids Dried at 180'C Method)	mg/l	764	-
11	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
12	Zinc	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.066	0.002
13	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.01	0.01
14	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.018	0.002
15	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
16	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.01	0.01
17	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
18	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
19	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.036	0.001
20	Nickel	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.018	0.002
21	Silver	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.24	0.002
22	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	5.920	0.002
23	Cyanide	HACH 8027 (Pyridine -Pyrazalone Method	mg/l	< 0.002	0.002
24	Total Cyanide	Distillation Process:APHA 4500-CN- C. Total Cyanide after Distillation, Determine Cyanide Concentration Process: HACH 8027 (Pyridine -Pyrazalone Method)	mg/l	0.003	0.002
25	Ammonia	HACH Method 10205 (Salicylate TNT Plus Method)	mg/l	0.260	0.020
26	Hexavalent Chromium (Cr6+)	ISO 11083:1994 (Determination of chromium(VI) Spectrometric method using 1,5-diphenylcarbazide)	mg/l	< 0.05	0.05
27	Fluoride	APHA 4110 B (Ion Chromatography with Chemical Suppression of Eluent Conductivity)	mg/l	0.216	0.014
28	Total Residual Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	0.1	0.1
29	Free Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	0.1	0.1
30	Sulphide	HACH 8131 (USEPA Methylene Blue Method)	mg/l	0.150	0.005
31	Formaldehyde	HACH 8110 (MBTH Method)	mg/l	0.126	0.003
32	Phenols	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

Analysed By :
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Supervisor

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MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED ★ MJTD

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Report No. : GEM-LAB-201906153
Revision No. : 1
Report Date : 20 June, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.
Project Name : MJTD
Sample Description
Sample Name : MKI-GW-1-0605 — Sampling Date : 5 June, 2019
Sample No. : W-19060153 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 5 June, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	2.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	5.42	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	6.9	0.7
4	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	920	1.8
5	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
6	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	2	0
7	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	< 0.05	0.050
8	Color	APHA 2120C (Spectrophotometric Method)	TCU	0.28	0.00
9	Odor	APHA 2150 B (Threshold Odor Test)	TON	1	0
10	TDS	APHA 2540 C (Total Dissolved Solids Dried at 180'C Method)	mg/l	1556	-
11	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
12	Zinc	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.034	0.002
13	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.01	0.01
14	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
15	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
16	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.01	0.01
17	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
18	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
19	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.102	0.001
20	Nickel	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
21	Silver	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
22	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.654	0.002
23	Cyanide	HACH 8027 (Pyridine -Pyrazalone Method	mg/l	< 0.002	0.002
24	Total Cyanide	Distillation Process:APHA 4500-CN- C. Total Cyanide after Distillation, Determine Cyanide Concentration Process: HACH 8027 (Pyridine -Pyrazalone Method)	mg/l	0.002	0.002
25	Ammonia	HACH Method 10205 (Salicylate TNT Plus Method)	mg/l	2.160	0.020
26	Hexavalent Chromium (Cr6+)	ISO 11083:1994 (Determination of chromium(VI) Spectrometric method using 1,5-diphenylcarbazide)	mg/l	< 0.05	0.05
27	Fluoride	APHA 4110 B (Ion Chromatography with Chemical Suppression of Eluent Conductivity)	mg/l	0.022	0.014
28	Total Residual Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	0.1	0.1
29	Free Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	< 0.1	0.1
30	Sulphide	HACH 8131 (USEPA Methylene Blue Method)	mg/l	< 0.005	0.005
31	Formaldehyde	HACH 8110 (MBTH Method)	mg/l	0.069	0.003
32	Phenols	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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June 20. 2019
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Tomoya Suzuki
Director June 20, 2019

APPENDIX-3 LABORATORY RESULT OF ESCHERICHIA COLI (SELF-MONITORING)

FOR DISCHARGED POINTS AND AFTER CENTRALIZED STP

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Report No. : GEM-LAB-201906089
Revision No. : 1
Report Date : 17 June, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.
Project Name : Environment Monitoring report for Zone A & B
Sample Description

Sample Name : MKI-SW-1-0605 — Sampling Date : 5 June, 2019
Sample No. : W-1906076 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 5 June, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	12.0	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

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Doc No: GEM-LB-R004E/00
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Report No. : GEM-LAB-201906090
Revision No. : 1
Report Date : 17 June, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.
Project Name : Environment Monitoring report for Zone A & B
Sample Description
Sample Name : MKI-SW-5-0605 Sampling Date : 5 June, 2019
Sample No. : W-1906077 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 5 June, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	3.6	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

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Approved By :

Tomoya Suzuki
Director June 17, 2019

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED ★ MJTD

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

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Doc No: GEM-LB-R004E/00
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Report No. : GEM-LAB-201906092
Revision No. : 1
Report Date : 17 June, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.
Project Name : Environment Monitoring report for Zone A & B
Sample Description
Sample Name : MKI-GW-1-0605 Sampling Date : 5 June, 2019
Sample No. : W-1906079 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 5 June, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	2.0	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

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Tomoya Suzuki
Director June 17, 2019

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED ★ MJTD

Thilawa Special Economic Zone (Zone A)

Development Project (Operation Phase)

Appendix

Water and Waste Water Monitoring Report

August, 2019

WATER QUALITY MONITORING REPORT

FOR DEVELOPMENT OF INDUSTRIAL AREA

IN THILAWA SEZ ZONE A

(OPERATION STAGE)

(Bi-Monthly Monitoring)

August 2019

Myanmar Koei International Ltd.

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED ★ MJTD

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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 A 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-1, SW-2, SW-4, SW-5, SW-6, and GW-1 have been monitored in Thilawa SEZ and its surrounding area in timely manner. Among the six locations, SW-1 and SW-5 are main discharged points of Thilawa SEZ and SW-6 is discharged from centralized Sewage Treatment Plant (STP) which is required to monitor by Environmental Monitoring Plan (EMoP) in EIA report of Thilawa SEZ Zone A. The remaining points SW-2 and SW-4 are sampled as a reference monitoring for comparison with discharged points and baseline of discharged creek. Moreover, GW-1 is monitored as a reference of existing tube well which is located in the monastery compound. Location of sampling points for water quality monitoring is shown in Figure 1.1-1.

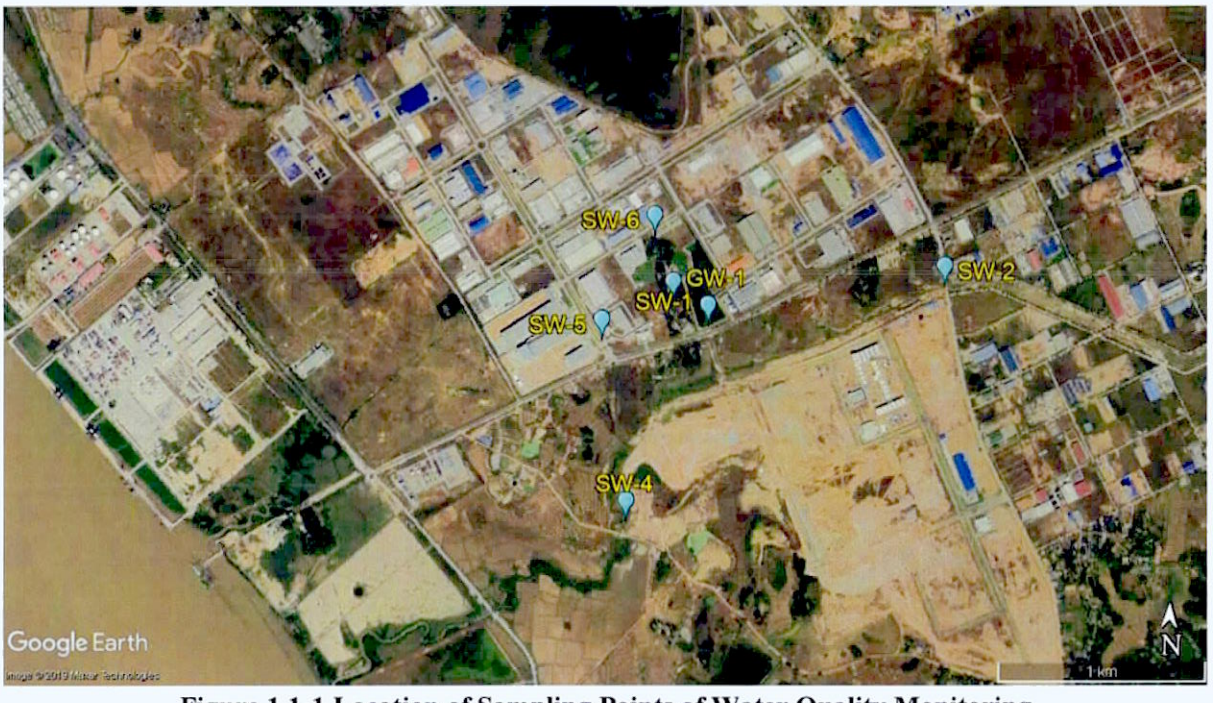

Figure 1.1-1 Location of Sampling Points of Water Quality Monitoring

CHAPTER 2: WATER QUALITY MONITORING

2.1 Monitoring Items

Sampling points and parameters for water quality monitoring are determined so as 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 carried out at five locations (SW-1, SW-2, SW-4, SW-5 and SW-6) 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-1	SW-2	SW-4	SW-5	SW-6	GW-1	Remarks
1	Water Temperature	○	○	○	○	○	○	On-site measurement
2	pH	○	○	○	○	○	○	On-site measurement
3	DO	○	○	○	○	○	○	On-site measurement
4	BOD (5)	○	○	○	○	○	○	Laboratory analysis
5	COD (Cr)	○	○	○	○	○	○	Laboratory analysis
6	Total Nitrogen	○	○	○	○	○	○	Laboratory analysis
7	Suspended Solids	○	○	○	○	○	○	Laboratory analysis
8	Total Coliform	○	○	○	○	○	○	Laboratory analysis
9	Total Phosphorous	○	○	○	○	○	○	Laboratory analysis
10	Color	○	○	○	○	○	○	Laboratory analysis
11	Odor	○	○	○	○	○	○	Laboratory analysis
12	Oil and Grease (Self-monitoring)	○	○	○	○	○	○	Laboratory analysis
13	Total Dissolved Solids (Self- monitoring)	○	○	○	○	○	○	Laboratory analysis
14	Iron (Self- monitoring)	○	○	○	○	○	○	Laboratory analysis
15	Mercury (Self- monitoring)	○	○	○	○	○	○	Laboratory analysis
16	Escherichia Coli (Self- monitoring)	○	-	-	○	-	○	Laboratory analysis
17	Flow Rate	○	○	○	○	○	-	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-1	**Coordinate** - N - 16° 40' 13.5", E - 96° 16' 39.8"
		Location - Outlet of Retention Pond
		Survey Item – Surface water sampling and water flow rate measurement.
2	SW-2	**Coordinate** - N - 16° 40' 20.69", E - 96° 17' 18.04"
		Location - Upstream of Shwe Pyauk Creek
		Survey Item – Surface water sampling and water flow rate measurement.
3	SW-4	**Coordinate**- N - 16° 39' 42.84", E - 96° 16' 27.42"
		Location - Downstream of Shwe Pyauk Creek
		Survey Item – Surface water sampling and water flow rate measurement.
4	SW-5	**Coordinate**- N - 16° 40' 10.7", E - 96° 16' 22.6"
		Location - Outlet of Retention Canal
		Survey Item – Surface water sampling and water flow rate measurement.
5	SW-6	**Coordinate**- N - 16° 40' 27.13", E - 96° 16' 30.68"
		Location - Outlet from STP to Retention Pond
		Survey Item – Surface water sampling and water flow rate measurement.
6	GW-1	**Coordinate**- N - 16° 40' 16.96", E - 96° 16' 34.01"
		Location - In Moegyoe Swan Monastery
		Survey Item – Ground Water Sampling.

Source: Myanmar Koei International Ltd.

SW-1

SW-1 was collected at the discharge point of retention pond which is located in the east of Moegyoe Swan monastery. The distance is about 530 m downstream of SW-6. This drainage is flowing from north to south and then connected to the Shwe Pyauk creek through earth drain. The water quality of this monitoring point has been influenced by the water from downstream due to flow back by tidal fluctuation. In addition, it seems that a part of wastewater from monastery has reached to the culvert in the SEZ area and discharging to the retention pond.

SW-2 (Reference Point)

SW-2 was collected at the upstream of Shwe Pyauk creek. This sampling point is located in the southeast of Zone A area and at the south of Dagon-Thilawa road. The surrounding areas are Zone B in the southwest and local industrial zone in the east respectively.

SW-4 (Reference Point)

SW-4 was collected at the downstream of Shwe Pyauk creek, after mixing of discharge 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 2.15 km downstream of SW-2. This sampling point is located in the southwest of Zone A area and in the south of Dagon-Thilawa road. The surrounding areas are Zone B and local industrial zone in the east respectively.

SW-5

SW-5 was collected at retention canal near main gate of Thilawa SEZ. Most of the water collected in this canal is rain water and domestic wastewater from surrounding. This canal is also connected to the Shwe Pyauk creek. The water quality of this monitoring point may have been influenced by the water from downstream due to flow back by tidal fluctuation.

SW-6

SW-6 was collected at the drain outlet of centralized STP which is located in the north of Moegyoe Swan monastery compound and retention pond (SW-1). Then the treated water is flowing to the retention pond. The distance is about 530 m upstream of SW-1.

GW-1 (Reference of Existing Tube Well)

GW-1 was collected from tube well as ground water sample. It is located in the compound of Moegyoe Swan monastery. Previous tube well GW-1, the water sample could not have collected because well water pump was broken. Therefore, GW-1 water sample was collected from the nearest tube well as ground water sample. The depth of the tube well is about 62 m below ground level and same depth with previous tube well GW-1. The surrounding areas are Zone A in the west, retention pond in the east and Dagon- Thilawa road in the south respectively.

2.3 Monitoring Method

All water samples were collected with cleaned sampling bottles 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	Water Temperature	Instrument Analysis Method (Horiba, U-52, Multi Water Quality Checker)
2	pH	Instrument Analysis Method (Horiba, U-52, Multi Water Quality Checker)
3	Suspended Solids (SS)	APHA 2540 D (Dry at 103-105°C Method)
4	Dissolved Oxygen (DO)	Instrument Analysis Method (Horiba, U-52, Multi Water Quality Checker)
5	BOD (5)	APHA 5210 B (5 Days BOD Test)
6	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)
7	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)
8	Total Nitrogen (T-N)	HACH Method 10072(TNT Persulfate Digestion Method)
9	Total Phosphorous (T-P)	APHA 4500-P E (Ascorbic Acid Method)
10	Color	APHA 2120C (Spectrophotometric Method)
11	Odor	APHA 2150 B (Threshold Odor Test)
12	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)
13	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
14	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
15	Total Dissolved Solids	APHA 2540 C (Total Dissolved Solids Dried at 180°C Method)
16	Escherichia Coli	APHA 9221 F (Escherichia Coli Procedure Using Fluorogenic Substrate)
17	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 conducted on 07 August 2019 and sampling time is shown in Table 2.4-1 to avoid tidal effect. The tide record for Yangon River, Myanmar on 07 August 2019 is shown in Table 2.4-2.

Table 2.4-1 Sampling Time of Each Station

No.	Station	Sampling Time
1	SW-1	07/08/2019 13:55
2	SW-2	07/08/2019 14:47
3	SW-4	07/08/2019 09:26
4	SW-5	07/08/2019 13:25
5	SW-6	07/08/2019 10:55
6	GW-1	07/08/2019 11:49

Source: Myanmar Koei International Ltd.

Table 2.4-2 Tide Record for Yangon River, Myanmar

Date	Time	Height	Tide Conditions
07/08/2019	04:03	1.31	Low Tide
	08:52	5.97	High Tide
	16:19	1.63	Low Tide
	21:10	5.72	High Tide

Source: Myanmar Port Authority, Tide Table for the Yangon River and Elephant Point, 2019.

2.5 Monitoring Results

Results of water quality monitoring are summarized in Table 2.5-1. Analytical results of the laboratory are described in Appendix-2, Appendix 3 and Appendix 4. 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 Water Quality at the Outlet of Sewage Treatment Plant of Industrial Area of Thilawa SEZ and at the Point before Discharging to Creek

As the comparison with the target value, the results of suspended solids (SS), total coliform and iron exceeded than the target values.

As for the result of SS, the result at the outlet of the centralized STP (SW-6) complied with the target value. It implied that effluents from each locator was treated well by the STP. On the other hand, results at the monitoring points of retention pond (SW-1) and retention canal (SW-5) before discharging to creek, exceeded the target value due to the expected reason; for SW-1 and SW-5: surface water run-off from bare land in Zone A.

As for the result of total coliform of surface water, the result at the outlet of the centralized STP (SW-6) complied with the target value. It may prove that effluents from each locator was treated well by the STP. On the other hand, results at monitoring points of retention pond (SW-1) and retention canal (SW-5) exceeded the target value due to the expected reason; the potential expected reason might be natural bacteria existed in all area of Zone A because there are various kinds of vegetation and creature such as birds, and small animals in and along the retention canals and retention ponds.

Since the composition of the total coliform include bacteria from natural origin, and even after total coliform do not affect human health directly, self-monitoring for E. Coli analysis was carried out to identify health impact by coliform bacteria. As for the result of E.Coli of surface water, all of results were under the reference value. Therefore, although the target value of total coliform exceeded at monitoring point of retention pond (SW-1) and retention canal (SW-5), but it is considered that there is no significant impact on human health.

As for the result of the iron, the result at the outlet of the centralized STP (SW-6) complied with the target value. It implied that effluents from each locator was treated well by the STP. On the other hand, the result at the monitoring point of retention pond (SW-1) and retention canal (SW-5) exceeded the target value.

The possible reasons may be i) iron is used as a construction material and in the rainy season, the water run-off from the construction sites of zone A may contain iron particles, ii) due to the influence of natural origin (iron can reach out from soil by run-off). In Yangon, soil is naturally rich in iron. This is expected as a temporary event as the iron from construction sites can enter into the water by run-off only in the rainy season.

Table 2.5-1 Results of Water Quality Monitoring on All Discharges and Gates

No.	Parameters	Unit	SW-1	SW-5	SW-6	Target Value (Reference Value for Self-Monitoring)
1	Temperature	˚C	26	26	28	≤ 35
2	pH	-	7.5	7.8	7.1	6~9
3	Suspended Solid (SS)	mg/L	96.00	244.00	10.00	50
4	Dissolved Oxygen (DO)	mg/L	7.03	6.87	6.10	-
5	BOD (5)	mg/L	4.45	3.24	0.26	30
6	COD (Cr)	mg/L	42	5.7	9.4	125
7	Total Coliform	MPN/ 100ml	> 160000	54000	< 1.8	400
8	Total Nitrogen (T-N)	mg/L	2.4	5.2	6.7	80
9	Total Phosphorous (T-P)	mg/L	0.240	0.543	0.371	2
10	Color	TCU (True Color Unit)	1.79	1.45	2.37	150
11	Odor	TON (Threshold Odor Number)	1	1	1	-
12	Oil and Grease	mg/L	< 3.1	< 3.1	< 3.1	10
13	Mercury	mg/L	≤ 0.002	≤ 0.002	≤ 0.002	0.005
14	Iron	mg/L	6.736	14.568	0.436	3.5
15	Total Dissolved Solids	mg/L	60	64	266	2000
16	Escherichia Coli	MPN/100ml (SW)	9.2	6.0	-	(1000)* (CFU/100ml)
17	Flow Rate	m^3/s	3.68	0.61	0.03	-

Note: Red color means exceeded value than target value.

*Note: Based on the water utilization at discharged creek, water quality C of quality standard for water baths in Japan, (Ministry of Environment, 1997) is set as a reference value for self-monitoring of E. coli for surface water monitoring. However, due to limitation of capacity for analytical laboratory in Myanmar, the method to analyze the "Colony Forming Unit (CFU)" is not available in Myanmar. Therefore, the results of "Most Probable Number (MPN)" are assumed similar to CFU values and compared with reference values. Once the method to analyze the CFU will be available in Myanmar, the analytical method will be changed.

According to the quality standard for water baths in Japan, (Ministry of Environment, 1997), in case of E.Coli result is exceeding 1,000 CFU/100 ml, since it is assumed unsafety, it is considered unsuitable for water baths.

Source: Myanmar Koei International Ltd.

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2.5.2 Results of Reference Monitoring for Comparison with Discharged Points and Baseline of Discharged Creek

Results of water quality monitoring are summarized in Table 2.5-2. The results were compared with the target value of effluent water quality discharging to water body stipulated in the EIA report.

As the comparison with the target value, the results of Suspended Solid (SS), total coliform and iron exceeded than the target value.

As for the result of SS, results at the surface water monitoring points (SW-2 and SW-4) exceeded the target value due to two expected reasons; i) delivered from upstream area such as natural origin and wastewater from local industrial zone which outside of Thilawa SEZ, and ii) 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 surface water monitoring points (SW-2 and SW-4) exceeded the target value due to two expected reasons; i) runoff of animal waste from the undeveloped area and delivered from local industrial zone and illegal dumping site from outside of Thilawa SEZ in the upstream area, and ii) delivered from surrounding area by tidal effect.

As for the result of iron, the result at the monitoring point of surface water monitoring point (SW-4) exceeded the target value. The possible reasons may be i) iron is used as a construction material and in the rainy season, the water run-off from the construction sites may contain iron particles, ii) due to the influence of natural origin (iron can reach out from soil by run-off). In Yangon, soil is naturally rich in iron. This is expected as a temporary event as the iron from construction sites can enter into the water by run-off only in the rainy season.

Table 2.5-2 Result of Water Quality Survey for Reference Monitoring Points for Comparison with Discharging Points and Baseline of Discharged Creek

No.	Parameters	Unit	SW-2	SW-4	GW-1	Target Value (Reference Value for Self-Monitoring)
1	Temperature	˚C	26	26	30	≤ 35
2	pH	-	6.9	7.1	8.1	6~9
3	Suspended Solid (SS)	mg/L	78.00	232.00	4.00	50
4	Dissolved Oxygen (DO)	mg/L	6.91	6.43	7.90	-
5	BOD (5)	mg/L	4.10	2.99	2.27	30
6	COD (Cr)	mg/L	11.6	5.2	7.0	125
7	Total Coliform	MPN/ 100ml	> 160000	11000	23	400
8	Total Nitrogen (T-N)	mg/L	2.6	3.2	4.1	80
9	Total Phosphorous (T-P)	mg/L	0.255	0.470	0.124	2
10	Color	TCU (True Color Unit)	6.54	3.49	0.00	150
11	Odor	TON (Threshold Odor Number)	1	1	1	-
12	Oil and Grease	mg/L	< 3.1	< 3.1	< 3.1	10
13	Mercury	mg/L	≤ 0.002	≤ 0.002	≤ 0.002	0.005
14	Iron	mg/L	3.440	11.924	0.598	3.5
15	Total Dissolved Solids	mg/L	56	68	1470	2000
16	Escherichia Coli	MPN/100ml* (SW)	-	-	-	(1,000)* (CFU/100ml)
		MPN/100ml** (GW)	-	-	2.0	(100)** (MPN/100ml)
17	Flow Rate	m^3/s	4.04	3.42	-	-

Note: Red color means the exceeded results than target value.

*Note: Based on the water utilization at discharged creek, water quality C of quality standard for water baths in Japan, (Ministry of Environment, 1997) is set as a reference value of self-monitoring for surface water monitoring. However, due to limitation of capacity for analytical laboratory in Myanmar, the method to analyze the "Colony Forming Unit (CFU)" is not available in Myanmar. Therefore, the results of "Most Probable Number (MPN)" are assumed similar to CFU values and compared with reference values. Once the method to analyze the CFU will be available in Myanmar, the analytical method will be changed.

According to the quality standard for water baths in Japan, (Ministry of Environment, 1997), in case of E.Coli result is exceeding 1,000 CFU/100 ml, since it is assumed unsafety, it is considered unsuitable for water baths.

**Note: Based on the water utilization at monitoring point for ground water, B1(Irrigation water) of National Technical Regulation on Surface Water Quality in Vietnam (No. QCVN 08: 2008/BTNMT) is set as a reference value of self-monitoring for ground water monitoring.

Source: Myanmar Koei International Ltd.

CHAPTER 3: CONCLUSION AND RECOMMENDATIONS

As for the result of SS, total coliform and iron at the outlet of the centralized STP (SW-6) complied with the target value. It may prove that effluent from each locator was treated well by the STP. On the other hand, the parameters of SS, results at the monitoring points of retention pond (SW-1) and retention canal (SW-5) before discharging to creek, exceeded the target value due to the expected reason; for SW-1 and SW-5: surface water run-off from bare land in Zone A.

Moreover, the parameters of total coliform at retention pond (SW-1) and retention canal (SW-5) exceeded the target values in this period for main discharged points of Thilawa SEZ Zone A. In addition, according to the result of self-monitoring of E. coli at retention pond (SW-1) and (SW-5), result was under the reference value. Therefore, although the target value of total coliform was exceeded at monitoring point (SW-1) and (SW-5), but it is considered that there is no significant impact on human health.

As for the result of the iron, the result at the monitoring point of retention pond (SW-1) and retention canal (SW-5) exceeded the target value. The possible reasons maybe i) iron is used as a construction material and in the rainy season, the water run-off from the construction sites of zone A may contain iron particles, ii) due to the influence of natural origin (iron can reach out from soil by run-off). In Yangon, soil is naturally rich in iron. This is expected as a temporary event as the iron from construction sites can enter into the water by run-off only in the rainy season.

As for parameters of SS, total coliform and iron in surface water exceeded the target values at reference monitoring points. The expected reasons for exceeding the target value of SS at (SW-2 and SW-4) are delivered from upstream area such as natural origin and wastewater from local industrial zone which is outside of Thilawa SEZ and influence by water from the downstream due to flow back by tidal fluctuation.

The expected reasons for exceeding the target values of total coliform at (SW-2 and SW-4) are by natural origin (natural bacteria existed).

The expected reasons for exceeding the target values of iron at SW-4 maybe due to i) iron is used as a construction material and in the rainy season, the water run-off from the construction sites may contain iron particles, ii) due to the influence of natural origin (iron can reach out from soil by run-off). In Yangon, soil is naturally rich in iron. This is expected as a temporary event as the iron from construction sites can enter into the water by run-off only in the rainy season.

As for future subject for main discharged points of Thilawa SEZ Zone A, the following action may be taken to achieve the target levels of SS, total coliform, iron and appropriate water quality monitoring:
- To continue monitoring Escherichia coli (E. coli) level to identify health impact by coliform bacteria; and
- To monitor the possibility of the overflow water from construction sites.
- To monitor the possibility of the domestic wastewater from construction sites.
- To cover the iron containing construction materials during heavy rain.

End of the Document

APPENDIX-1 FIELD SURVEY PHOTOS

FOR DISCHARGED POINTS OF THILAWA SEZ ZONE A

Surface water sampling and onsite measurement at SW-1

Surface water sampling and onsite measurement at SW-5

Surface water sampling and onsite measurement at SW-6

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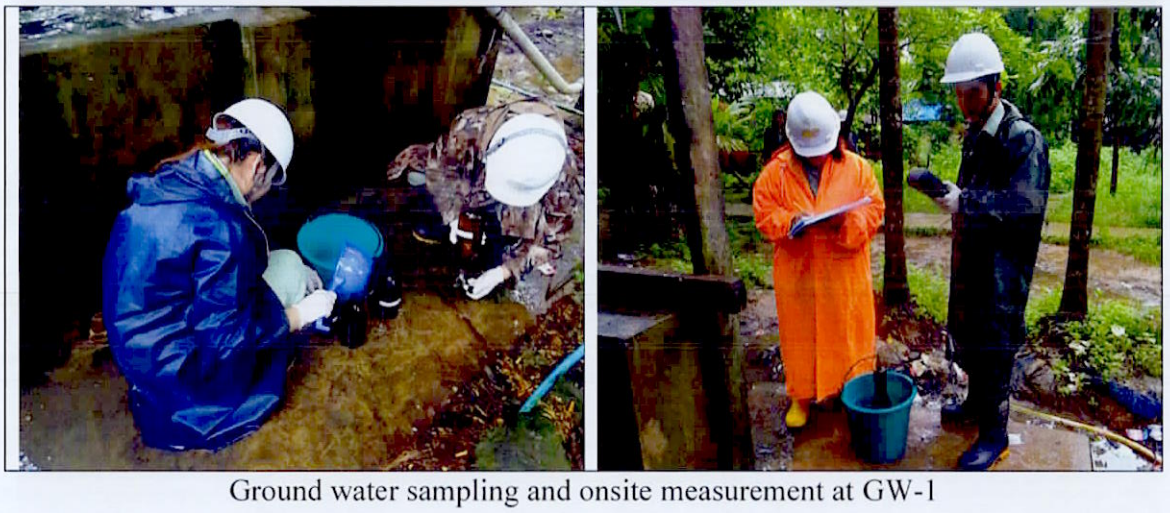
FOR REFERENCE MONITORING POINTS FOR COMPARISON WITH DISCHARGED POINTS AND BASELINE OF DISCHARGED CREEK

Surface water sampling and onsite measurement at SW-2

Surface water sampling and onsite measurement at SW-4



Ground water sampling and onsite measurement at GW-1

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APPENDIX-2 LABORATORY RESULTS

FOR DISCHARGED POINTS AND AFTER CENTRALIZED STP

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Report No. : GEM-LAB-201908209
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Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.
Project Name : Environment Monitoring report for Zone A & B
Sample Description
Sample Name : MKI-SW-1-0807 Sampling Date : 7 August, 2019
Sample No. : W-1908071 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 7 August, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	96.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	4.45	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	42	0.7
4	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	> 160000	1.8
5	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	2.4	0
6	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.240	0.050
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	1.79	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	1	0

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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Supervisor

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Approved By :

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Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.
Project Name : Environment Monitoring report for Zone A & B
Sample Description

Sample Name : MKI-SW-5-0807 — Sampling Date : 7 August, 2019
Sample No. : W-1908072 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 7 August, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	244.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	3.24	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	5.7	0.7
4	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	54000	1.8
5	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	5.2	0
6	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.543	0.050
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	1.45	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	1	0

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

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Report No. : GEM-LAB-201908211
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Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.
Project Name : Environment Monitoring report for Zone A & B
Sample Description

Sample Name : MKI-SW-6-0807 — Sampling Date : 7 August, 2019
Sample No. : W-1908073 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 7 August, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	10.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	0.26	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	9.4	0.7
4	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	< 1.8	1.8
5	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	6.7	0
6	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.371	0.050
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	2.37	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	1	0

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

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Report No. : GEM-LAB-201908212
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Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.
Project Name : Environment Monitoring report for Zone A & B
Sample Description

Sample Name : MKI-SW-2-0807 — Sampling Date : 7 August, 2019
Sample No. : W-1908074 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 7 August, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	78.00	_
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	4.10	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	11.6	0.7
4	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	> 160000	1.8
5	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	2.6	0
6	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.255	0.050
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	6.54	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	1	0
9	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
10	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002

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

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Report No. : GEM-LAB-201908213
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Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.
Project Name : Environment Monitoring report for Zone A & B
Sample Description

Sample Name : MKI-SW-4-0807 — Sampling Date : 7 August, 2019
Sample No. : W-1908075 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 7 August, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	232.00	_
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	2.99	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	5.2	0.7
4	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	11000	1.8
5	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	3.2	0
6	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.470	0.050
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	3.49	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	1	0
9	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
10	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.02	0.002

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

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Report No. : GEM-LAB-201908214
Revision No. : 1
Report Date : 27 August, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)

Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.

Project Name : Environment Monitoring report for Zone A & B

Sample Description

Sample Name : MKI-GW-1-0807 — Sampling Date : 7 August, 2019

Sample No. : W-1908076 — Sampling By : Customer

Waste Profile No. : - — Sample Received Date : 7 August, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	4.00	_
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	2.27	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	7.0	0.7
4	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	23	1.8
5	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	4.1	0
6	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.124	0.050
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	0.00	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	1	0

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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Aug 27, 2019

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APPENDIX-3 LABORATORY RESULT OF ESCHERICHIA COLI (SELF-MONITORING)

FOR DISCHARGED POINTS AND AFTER CENTRALIZED STP

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Report No. : GEM-LAB-201908194
Revision No. : 1
Report Date : 22 August, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.
Project Name : Environment Monitoring report for Zone A & B
Sample Description
Sample Name : MKI-SW-1-0807 Sampling Date : 7 August, 2019
Sample No. : W-1908058 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 7 August, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	9.2	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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Doc No: GEM-LB-R004E/00
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Report No. : GEM-LAB-201908195
Revision No. : 1
Report Date : 22 August, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tarnwe Township, Yangon, Myanmar.
Project Name : Environment Monitoring report for Zone A & B
Sample Description
Sample Name : MKI-SW-5-0807 Sampling Date : 7 August, 2019
Sample No. : W-1908059 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 7 August, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	6.0	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 :

Ni Ni Aye Lwin
Supervisor

LAB
22 August, 2019
GEM

Approved By :

奈良部 善之

Yoshiyuki Narabe 22 August, 2019
Manager

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED
MJTD

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

DOWA

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Report No. : GEM-LAB-201908197
Revision No. : 1
Report Date : 22 August, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.
Project Name : Environment Monitoring report for Zone A & B
Sample Description
Sample Name : MKI-GW-1-0807 Sampling Date : 7 August, 2019
Sample No. : W-1908061 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 7 August, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	2.0	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 :

奈良部 善之

Yoshiyuki Narabe 22 August, 2019
Manager

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APPENDIX-4 LABORATORY RESULTS (SELF-MONITORING)

FOR DISCHARGED POINTS AND AFTER CENTRALIZED STP

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Doc No: GEM-LB-R004E/00
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Report No. : GEM-LAB-201908201
Revision No. : 1
Report Date : 23 August, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.
Project Name : Environment Monitoring report for Zone A & B
Sample Description

Sample Name : MKI-SW-1-0807 — Sampling Date : 7 August, 2019
Sample No. : W-1908063 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 7 August, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
2	TDS	APHA 2540 C (Total Dissolved Solids Dried at 180'C Method)	mg/l	60	-
3	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
4	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	6.736	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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Tomoya Suzuki
Director
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Report No. : GEM-LAB-201908202
Revision No. : 1
Report Date : 23 August, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.
Project Name : Environment Monitoring report for Zone A & B
Sample Description
Sample Name : MKI-SW-5-0807 — Sampling Date : 7 August, 2019
Sample No. : W-1908064 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 7 August, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
2	TDS	APHA 2540 C (Total Dissolved Solids Dried at 180'C Method)	mg/l	64	-
3	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
4	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	14.568	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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Doc No: GEM-LB-R004E/00
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Report No. : GEM-LAB-201908203
Revision No. : 1
Report Date : 23 August, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.
Project Name : Environment Monitoring report for Zone A & B
Sample Description

Sample Name : MKI-SW-6-0807 — Sampling Date : 7 August, 2019
Sample No. : W-1908065 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 7 August, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
2	TDS	APHA 2540 C (Total Dissolved Solids Dried at 180'C Method)	mg/l	266	-
3	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
4	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.436	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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Approved By :

Tomoya Suzuki
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Aug 27, 2019

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED
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FOR REFERENCE MONITORING POINTS FOR COMPARISON WITH DISCHARGING POINTS AND BASELINE OF DISCHARGED CREEK

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Doc No: GEM-LB-R004E/00
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Report No. : GEM-LAB-201908204
Revision No. : 1
Report Date : 23 August, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.
Project Name : Environment Monitoring report for Zone A & B
Sample Description
Sample Name : MKI-SW-2-0807 — Sampling Date : 7 August, 2019
Sample No. : W-1908066 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 7 August, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	TDS	APHA 2540 C (Total Dissolved Solids Dried at 180'C Method)	mg/l	56	-
2	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
3	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	3.440	0.002

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

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Report No. : GEM-LAB-201908205
Revision No. : 1
Report Date : 23 August, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.
Project Name : Environment Monitoring report for Zone A & B
Sample Description

Sample Name : MKI-SW-4-0807 — Sampling Date : 7 August, 2019
Sample No. : W-1908067 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 7 August, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	TDS	APHA 2540 C (Total Dissolved Solids Dried at 180'C Method)	mg/l	68	-
2	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
3	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	11.924	0.002

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

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Report No. : GEM-LAB-201908206
Revision No. : 1
Report Date : 23 August, 2019
Application No. : 0001-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)

Address : No, 36/A, 1st Floor, Grand Pho Sein Condominium, Pho Sein Road, Tamwe Township, Yangon, Myanmar.

Project Name : Environment Monitoring report for Zone A & B

Sample Description

Sample Name : MKI-GW-1-0807 — Sampling Date : 7 August, 2019

Sample No. : W-1908068 — Sampling By : Customer

Waste Profile No. : - — Sample Received Date : 7 August, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
2	TDS	APHA 2540 C (Total Dissolved Solids Dried at 180'C Method)	mg/l	1470	-
3	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
4	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.598	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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Aug 27, 2019
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Director Aug 27, 2019

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED
MJTD

Thilawa Special Economic Zone (Zone A)

Development Project (Operation Phase)

Appendix

Air Quality Monitoring Report

August, 2019

AIR QUALITY MONITORING

REPORT

FOR DEVELOPMENT OF INDUSTRIAL AREA

THILAWA SEZ ZONE A

(OPERATION STAGE)

(BI-ANNUALLY MONITORING)

August 2019

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 the 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 A in accordance with the approved Environmental Impact Assessment (EIA) report with Environmental Management Plan (EMP). MJTD has implemented monitoring of various environmental items with the specified time frame to know about the environmental conditions in and around the area.

1.2 Outlines of Monitoring Plan

To assess the environmental condition under the operation of industrial area in and around Thilawa SEZ Zone A, air quality had been monitored from 13 August 2019 – 20 August 2019 as follows;

Table 1.2-1 Outlines of Air Quality Monitoring Plan

Monitoring Date	Monitoring Item	Parameters	Number of Point	Duration	Monitoring Methodology
From 13 August – 20 August, 2019	Air Quality	CO, NO_2, TSP, PM_{10} and SO_2	1	7 Days	On site measurement by Haz-Scanner Environmental Perimeter Air Station (EPAS)

Source: Myanmar Koei International Ltd.

CHAPTER 2: AIR QUALITY MONITORING

2.1 Monitoring Item

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

2.2 Monitoring Location

The air quality measurement equipment, "Haz-Scanner Environmental Perimeter Air Station (EPAS) was set up inside the centralized Sewage Treatment Plant (STP) compound which is southeast of the Thilawa SEZ Zone A, N: 16°40'28.07", E: 96°16'34.06". The air quality survey location was changed from the previous location (N: 16°40'28.38", E: 96°16'34.71") to (N: 16°40'28.07", E: 96°16'34.06") because of the construction of a new pond/sediment pond. It is surrounded by the factories of Thilawa SEZ Zone A, north of Dagon-Thilawa road and northeast of Moegyoe Swan monastery respectively. Possible emission sources are dust emissions from construction activities of surrounding Zone A's locators and exhaust gas emissions from surrounded factories. The location of air quality monitoring is shown in the Figure 2.2-1.

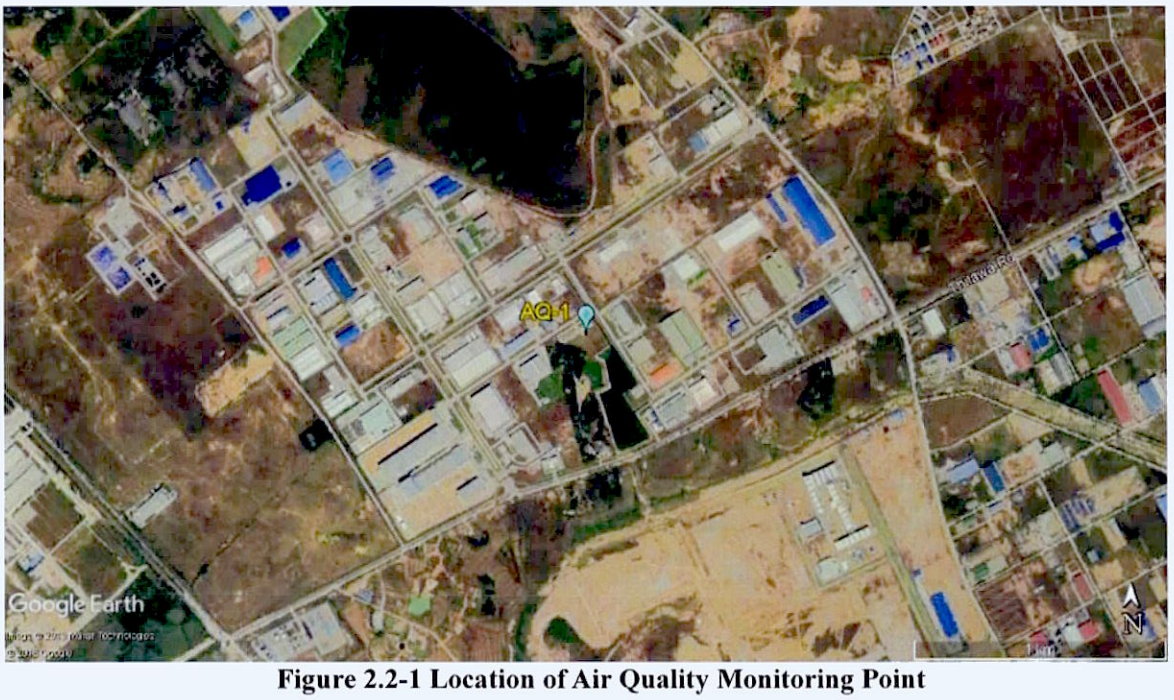

Figure 2.2-1 Location of Air Quality Monitoring Point

2.3 Monitoring Period

Air quality monitoring was conducted seven consecutive days from 13 August – 20 August, 2019.

2.4 Monitoring Method

Monitoring of CO, NO_2, TSP, 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 minutes and directly reads and records onsite for CO, NO_2, TSP, PM_{10} and SO_2. The certificate of calibration for air quality monitoring equipment is shown in Appendix-2. Air quality monitoring equipment is maintained for the proper conditions for the measurement. Due to the limitation of the analytical equipment in Myanmar, TSP results were calculated as predicted value which is based on the results of PM_{10}. Therefore, the result of TSP was evaluated using the estimated TSP concentration values. The state of air quality monitoring is shown in Figure 2.4-1.

Source: Myanmar Koei International Ltd.

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, TSP, PM_{10} and SO_2 are described in Table 2.5-1. Comparing with the target value of CO, NO_2, TSP, PM_{10} and SO_2 prescribed in EIA report for Thilawa SEZ development project Zone A, concentration of CO, NO_2, TSP, PM_{10} and SO_2 were lower than the target value.

Regarding the calculation of predicted TSP concentration, the correlation value between PM10 and TSP of ambient air quality guideline value in Thailand as below;

330 µg/m^3 (TSP standard value in Thailand) / 120 µg/m^3 (PM_{10} standard value in Thailand) = 2.75 (Correlation value)

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

Date	CO	NO_2	TSP	PM_{10}	SO_2
	mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3
13 ~ 14 August, 2019	0.050	0.016	0.172	0.063	0.017
14 ~ 15 August, 2019	0.065	0.015	0.120	0.044	0.022
15 ~ 16 August, 2019	0.072	0.019	0.105	0.038	0.018
16 ~ 17 August, 2019	0.085	0.020	0.084	0.031	0.020
17 ~ 18 August, 2019	0.087	0.019	0.057	0.021	0.014
18 ~ 19 August, 2019	0.060	0.007	0.060	0.022	0.021
19 ~ 20 August, 2019	0.069	0.025	0.050	0.018	0.022
7 Days Average Value	0.070	0.017	0.093	0.034	0.019
Target Value	11.45	0.11	<0.33	<0.12	0.11

The target value of CO, NO_2 and SO_2 were converted from ppm units to mg/m^3. The conversion equation are as follows;
1. (CO, mg/m^3) = (CO, ppm) * (Molecular Weight of CO (28)) / 24.45
2. (NO_2, mg/m^3) = (NO_2, ppm) * (Molecular Weight of NO_2 (46)) / 24.45
3. (SO_2, mg/m^3) = (SO_2, ppm) * (Molecular Weight of SO_2 (64)) / 24.45
Source: Myanmar Koei International Ltd.

Wind direction and wind speed were measured at AQ-1. Hourly average values of measured wind direction and wind speed data are described in Appendix 1. Status of air quality monitoring point and wind direction are described in Figure 2.5-1.

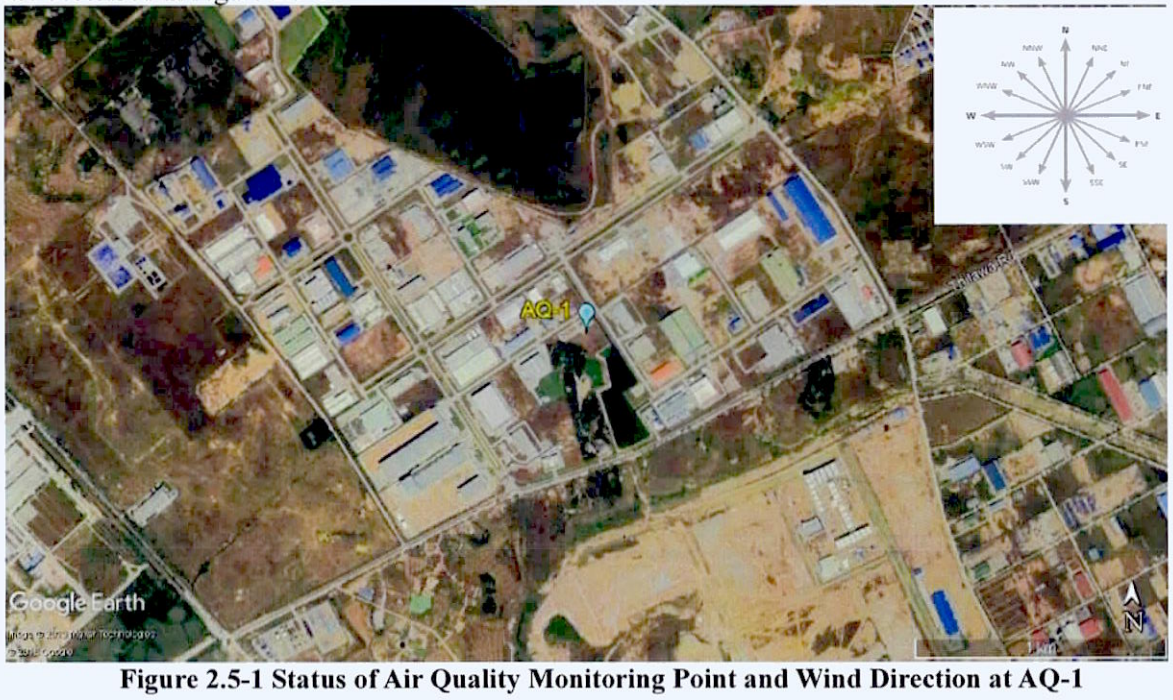

Figure 2.5-1 Status of Air Quality Monitoring Point and Wind Direction at AQ-1

Remark: N *North* NNE *North-Northeast* NE *Northeast* ENE *East-Northeast* E *East* ESE *East-Southeast* SE *Southeast* SSE *South-Southeast* S *South* SSW *South-Southwest* SW *Southwest* WSW *West-Southwest* W *West* WNW *West-Northwest* NW *Northwest* NNW *North-Northwest*

CHAPTER 3: CONCLUSION AND RECOMMENDATION

The result of air quality at AQ-1, concentration of CO, NO_2, TSP, PM_{10} and SO_2 during seven days monitoring was not exceeded the target value, thus there is no impacts from the operation activities of Zone A.

In conclusion of this environmental survey periodical monitoring will be necessary to grasp the environmental conditions in Thilawa SEZ Zone A and to show the compliance status in the operation stage of Thilawa SEZ Zone A. The mitigation measures for environmental management will be considered in collected periodical environmental data and has to be reviewed in future.

APPENDIX 1: HOURLY AIR RESULT

Date	Time	CO	NO_2	TSP	PM_{10}	SO_2	Wind Speed	Wind Direction	
		mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3	kph	Deg.	Direction
		Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly
13 Aug 2019	13:00 ~ 14:00	0.003	0.019	0.121	0.044	0.002	2.02	158.17	SSE
13 Aug 2019	14:00 ~ 15:00	0.020	0.037	0.042	0.015	0.001	1.47	159.67	SSE
13 Aug 2019	15:00 ~ 16:00	0.035	0.005	0.105	0.038	0.001	1.42	155.50	SSE
13 Aug 2019	16:00 ~ 17:00	0.043	0.013	0.169	0.062	0.001	1.20	194.33	SSW
13 Aug 2019	17:00 ~ 18:00	0.106	0.048	0.110	0.040	0.001	0.27	217.17	SW
13 Aug 2019	18:00 ~ 19:00	0.079	0.051	0.194	0.071	0.003	0.30	190.50	S
13 Aug 2019	19:00 ~ 20:00	0.058	0.036	0.214	0.078	0.008	1.00	155.83	SSE
13 Aug 2019	20:00 ~ 21:00	0.057	0.020	0.193	0.070	0.015	0.87	150.67	SSE
13 Aug 2019	21:00 ~ 22:00	0.040	0.020	0.206	0.075	0.002	0.92	152.00	SSE
13 Aug 2019	22:00 ~ 23:00	0.040	0.019	0.240	0.087	0.003	0.70	153.17	SSE
13 Aug 2019	23:00 ~ 0:00	0.033	0.008	0.261	0.095	0.008	1.30	146.00	SE
13 Aug 2019	0:00 ~ 1:00	0.009	0.004	0.262	0.095	0.005	1.07	154.83	SSE
14 Aug 2019	1:00 ~ 2:00	0.035	0.014	0.212	0.077	0.001	0.98	157.17	SSE
14 Aug 2019	2:00 ~ 3:00	0.049	0.017	0.191	0.069	0.005	0.77	155.17	SSE
14 Aug 2019	3:00 ~ 4:00	0.053	0.009	0.200	0.073	0.006	0.57	152.83	SSE
14 Aug 2019	4:00 ~ 5:00	0.005	0.007	0.372	0.135	0.002	0.42	156.33	SSE
14 Aug 2019	5:00 ~ 6:00	0.101	0.009	0.276	0.100	0.033	0.32	146.33	SSE
14 Aug 2019	6:00 ~ 7:00	0.104	0.011	0.266	0.097	0.060	0.28	197.67	SSW
14 Aug 2019	7:00 ~ 8:00	0.103	0.018	0.160	0.058	0.041	0.68	157.83	SSE
14 Aug 2019	8:00 ~ 9:00	0.025	0.004	0.159	0.058	0.081	0.98	210.83	SSW
14 Aug 2019	9:00 ~ 10:00	0.058	0.004	0.094	0.034	0.042	0.93	256.33	WSW
14 Aug 2019	10:00 ~ 11:00	0.040	0.004	0.057	0.021	0.021	1.33	254.83	WSW
14 Aug 2019	11:00 ~ 12:00	0.015	0.004	0.021	0.008	0.057	1.15	241.33	WSW
14 Aug 2019	12:00 ~ 13:00	0.101	0.004	0.004	0.002	0.007	1.02	239.00	WSW

Max	0.106	0.051	0.372	0.135	0.081
Avg	0.050	0.016	0.172	0.063	0.017
Min	0.003	0.004	0.004	0.002	0.001

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED MJTD

Date	Time	CO	NO_2	TSP	PM_{10}	SO_2	Wind Speed	Wind Direction	
		mg/m³	mg/m³	mg/m³	mg/m³	mg/m³	kph	Deg.	Direction
		Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly
14 Aug 2019	13:00 ~ 14:00	0.005	0.004	0.066	0.024	0.005	1.12	245.33	WSW
14 Aug 2019	14:00 ~ 15:00	0.033	0.004	0.112	0.041	0.003	1.43	260.83	W
14 Aug 2019	15:00 ~ 16:00	0.108	0.030	0.044	0.016	0.000	1.12	251.67	WSW
14 Aug 2019	16:00 ~ 17:00	0.107	0.021	0.131	0.047	0.006	0.48	215.50	SW
14 Aug 2019	17:00 ~ 18:00	0.080	0.042	0.109	0.040	0.003	1.28	250.67	WSW
14 Aug 2019	18:00 ~ 19:00	0.133	0.021	0.026	0.009	0.001	0.97	167.00	SSE
14 Aug 2019	19:00 ~ 20:00	0.054	0.051	0.139	0.050	0.000	1.00	158.17	SSE
14 Aug 2019	20:00 ~ 21:00	0.093	0.050	0.136	0.049	0.001	0.60	155.00	SSE
14 Aug 2019	21:00 ~ 22:00	0.070	0.035	0.139	0.051	0.000	0.70	161.33	SSE
14 Aug 2019	22:00 ~ 23:00	0.049	0.020	0.144	0.052	0.002	0.07	184.50	S
14 Aug 2019	23:00 ~ 0:00	0.041	0.006	0.136	0.049	0.006	0.27	212.17	SSW
14 Aug 2019	0:00 ~ 1:00	0.037	0.008	0.112	0.041	0.012	0.32	201.00	SSW
15 Aug 2019	1:00 ~ 2:00	0.055	0.013	0.126	0.046	0.021	0.20	161.33	SSE
15 Aug 2019	2:00 ~ 3:00	0.049	0.015	0.159	0.058	0.010	0.28	167.67	SSE
15 Aug 2019	3:00 ~ 4:00	0.050	0.004	0.153	0.056	0.021	0.37	209.50	SSW
15 Aug 2019	4:00 ~ 5:00	0.047	0.005	0.153	0.056	0.015	0.52	258.50	WSW
15 Aug 2019	5:00 ~ 6:00	0.079	0.008	0.177	0.065	0.022	0.52	259.67	W
15 Aug 2019	6:00 ~ 7:00	0.101	0.007	0.193	0.070	0.036	0.43	233.00	SW
15 Aug 2019	7:00 ~ 8:00	0.061	0.004	0.149	0.054	0.036	0.75	253.17	WSW
15 Aug 2019	8:00 ~ 9:00	0.088	0.004	0.163	0.059	0.086	1.00	255.67	WSW
15 Aug 2019	9:00 ~ 10:00	0.082	0.004	0.132	0.048	0.105	1.27	251.67	WSW
15 Aug 2019	10:00 ~ 11:00	0.063	0.004	0.117	0.043	0.078	1.55	261.83	W
15 Aug 2019	11:00 ~ 12:00	0.047	0.004	0.035	0.013	0.030	2.10	272.33	W
15 Aug 2019	12:00 ~ 13:00	0.038	0.004	0.030	0.011	0.022	2.28	283.17	WNW

Max	0.133	0.051	0.193	0.070	0.105
Avg	0.065	0.015	0.120	0.044	0.022
Min	0.005	0.004	0.026	0.009	0.000

Date	Time			CO	NO_2	TSP	PM_{10}	SO_2	Wind Speed	Wind Direction	
				mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3	kph	Deg.	Direction
				Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly
15 Aug 2019	13:00	~	14:00	0.031	0.004	0.123	0.045	0.001	2.72	272.33	W
15 Aug 2019	14:00	~	15:00	0.054	0.004	0.054	0.020	0.079	2.30	264.50	W
15 Aug 2019	15:00	~	16:00	0.036	0.004	0.143	0.052	0.014	1.87	264.50	W
15 Aug 2019	16:00	~	17:00	0.082	0.004	0.077	0.028	0.017	1.37	259.33	W
15 Aug 2019	17:00	~	18:00	0.144	0.039	0.116	0.042	0.002	1.32	298.33	WNW
15 Aug 2019	18:00	~	19:00	0.117	0.048	0.085	0.031	0.001	1.38	133.67	SE
15 Aug 2019	19:00	~	20:00	0.104	0.060	0.052	0.019	0.000	1.42	77.50	ENE
15 Aug 2019	20:00	~	21:00	0.106	0.050	0.030	0.011	0.001	1.30	114.00	ESE
15 Aug 2019	21:00	~	22:00	0.071	0.044	0.042	0.015	0.000	1.38	139.83	SE
15 Aug 2019	22:00	~	23:00	0.079	0.046	0.064	0.023	0.001	1.17	153.50	SSE
15 Aug 2019	23:00	~	0:00	0.070	0.035	0.166	0.060	0.009	0.75	163.00	SSE
15 Aug 2019	0:00	~	1:00	0.078	0.032	0.167	0.061	0.011	0.50	179.67	S
16 Aug 2019	1:00	~	2:00	0.066	0.014	0.157	0.057	0.021	0.45	218.17	SW
16 Aug 2019	2:00	~	3:00	0.053	0.011	0.131	0.048	0.017	0.43	234.17	SW
16 Aug 2019	3:00	~	4:00	0.065	0.013	0.130	0.047	0.019	0.42	233.67	SW
16 Aug 2019	4:00	~	5:00	0.066	0.007	0.141	0.051	0.020	0.70	225.67	SW
16 Aug 2019	5:00	~	6:00	0.066	0.007	0.140	0.051	0.009	0.70	242.83	WSW
16 Aug 2019	6:00	~	7:00	0.112	0.016	0.128	0.046	0.024	0.67	258.17	WSW
16 Aug 2019	7:00	~	8:00	0.066	0.006	0.125	0.045	0.040	1.07	261.50	W
16 Aug 2019	8:00	~	9:00	0.083	0.004	0.143	0.052	0.029	1.70	265.50	W
16 Aug 2019	9:00	~	10:00	0.049	0.004	0.120	0.044	0.033	2.15	271.67	W
16 Aug 2019	10:00	~	11:00	0.048	0.004	0.053	0.019	0.044	2.30	265.33	W
16 Aug 2019	11:00	~	12:00	0.030	0.004	0.057	0.021	0.039	2.50	264.67	W
16 Aug 2019	12:00	~	13:00	0.055	0.004	0.072	0.026	0.001	2.22	264.00	W

Max	0.144	0.060	0.187	0.061	0.079
Avg	0.072	0.019	0.105	0.038	0.018
Min	0.030	0.004	0.030	0.011	0.000

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Date	Time	CO	NO_2	TSP	PM_{10}	SO_2	Wind Speed	Wind Direction	
		mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3	kph	Deg.	Direction
		Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly
16 Aug 2019	13:00 ~ 14:00	0.072	0.004	0.059	0.021	0.053	3.27	269.67	W
16 Aug 2019	14:00 ~ 15:00	0.082	0.004	0.073	0.026	0.030	3.47	265.33	W
16 Aug 2019	15:00 ~ 16:00	0.103	0.004	0.054	0.020	0.056	2.37	260.83	W
16 Aug 2019	16:00 ~ 17:00	0.105	0.004	0.151	0.055	0.020	2.38	264.33	W
16 Aug 2019	17:00 ~ 18:00	0.100	0.028	0.116	0.042	0.001	1.80	258.83	W
16 Aug 2019	18:00 ~ 19:00	0.129	0.063	0.070	0.025	0.001	1.07	233.83	SW
16 Aug 2019	19:00 ~ 20:00	0.119	0.066	0.052	0.019	0.001	0.85	190.50	S
16 Aug 2019	20:00 ~ 21:00	0.090	0.049	0.070	0.025	0.000	0.88	257.33	WSW
16 Aug 2019	21:00 ~ 22:00	0.106	0.057	0.065	0.024	0.001	0.70	253.33	WSW
16 Aug 2019	22:00 ~ 23:00	0.092	0.024	0.115	0.042	0.009	0.57	236.67	WSW
16 Aug 2019	23:00 ~ 0:00	0.085	0.030	0.081	0.029	0.006	0.67	254.33	WSW
16 Aug 2019	0:00 ~ 1:00	0.097	0.024	0.114	0.042	0.007	0.58	249.00	WSW
17 Aug 2019	1:00 ~ 2:00	0.071	0.011	0.150	0.055	0.010	0.68	252.67	WSW
17 Aug 2019	2:00 ~ 3:00	0.070	0.011	0.104	0.038	0.001	0.80	254.17	WSW
17 Aug 2019	3:00 ~ 4:00	0.068	0.019	0.075	0.027	0.002	0.82	257.67	WSW
17 Aug 2019	4:00 ~ 5:00	0.086	0.022	0.087	0.032	0.011	0.47	247.33	WSW
17 Aug 2019	5:00 ~ 6:00	0.083	0.023	0.105	0.038	0.009	0.72	258.50	WSW
17 Aug 2019	6:00 ~ 7:00	0.149	0.019	0.118	0.043	0.030	0.68	237.67	WSW
17 Aug 2019	7:00 ~ 8:00	0.068	0.010	0.136	0.049	0.019	0.93	257.33	WSW
17 Aug 2019	8:00 ~ 9:00	0.066	0.004	0.103	0.037	0.075	1.32	257.00	WSW
17 Aug 2019	9:00 ~ 10:00	0.064	0.000	0.028	0.010	0.034	1.73	258.17	WSW
17 Aug 2019	10:00 ~ 11:00	0.037	0.004	0.009	0.003	0.014	1.82	258.17	WSW
17 Aug 2019	11:00 ~ 12:00	0.043	0.004	0.072	0.026	0.033	1.50	243.83	WSW
17 Aug 2019	12:00 ~ 13:00	0.057	0.004	0.017	0.006	0.059	1.68	244.83	WSW

Max	0.149	0.066	0.151	0.055	0.075
Avg	0.085	0.020	0.084	0.031	0.020
Min	0.037	0.000	0.009	0.003	0.000

Date	Time	CO	NO_2	TSP	PM_{10}	SO_2	Wind Speed	Wind Direction	
		mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3	kph	Deg.	Direction
		Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly
17 Aug 2019	13:00 ~ 14:00	0.079	0.005	0.109	0.040	0.002	2.50	166.83	SSE
17 Aug 2019	14:00 ~ 15:00	0.134	0.008	0.031	0.011	0.000	2.62	147.50	SSE
17 Aug 2019	15:00 ~ 16:00	0.128	0.005	0.017	0.006	0.042	1.88	161.83	SSE
17 Aug 2019	16:00 ~ 17:00	0.139	0.004	0.069	0.025	0.028	2.12	158.33	SSE
17 Aug 2019	17:00 ~ 18:00	0.111	0.010	0.031	0.011	0.002	1.93	159.33	SSE
17 Aug 2019	18:00 ~ 19:00	0.046	0.010	0.088	0.032	0.000	2.40	265.00	W
17 Aug 2019	19:00 ~ 20:00	0.109	0.000	0.012	0.004	0.001	1.17	265.83	W
17 Aug 2019	20:00 ~ 21:00	0.111	0.042	0.033	0.012	0.000	0.42	230.50	SW
17 Aug 2019	21:00 ~ 22:00	0.102	0.053	0.038	0.014	0.011	0.30	211.33	SSW
17 Aug 2019	22:00 ~ 23:00	0.119	0.040	0.040	0.015	0.025	0.17	172.83	S
17 Aug 2019	23:00 ~ 0:00	0.076	0.019	0.076	0.028	0.019	0.82	128.17	SE
17 Aug 2019	0:00 ~ 1:00	0.059	0.005	0.077	0.028	0.011	0.80	153.33	SSE
18 Aug 2019	1:00 ~ 2:00	0.044	0.013	0.094	0.034	0.000	0.22	199.50	SSW
18 Aug 2019	2:00 ~ 3:00	0.054	0.011	0.057	0.021	0.005	0.97	143.83	SE
18 Aug 2019	3:00 ~ 4:00	0.056	0.009	0.045	0.017	0.005	0.28	176.67	S
18 Aug 2019	4:00 ~ 5:00	0.074	0.008	0.055	0.020	0.019	0.80	154.33	SSE
18 Aug 2019	5:00 ~ 6:00	0.091	0.021	0.096	0.035	0.016	0.82	185.17	S
18 Aug 2019	6:00 ~ 7:00	0.107	0.000	0.101	0.037	0.008	0.40	223.67	SW
18 Aug 2019	7:00 ~ 8:00	0.098	0.054	0.035	0.013	0.024	0.38	162.33	SSE
18 Aug 2019	8:00 ~ 9:00	0.140	0.062	0.065	0.024	0.048	0.52	168.83	S
18 Aug 2019	9:00 ~ 10:00	0.133	0.042	0.075	0.027	0.049	1.08	170.83	S
18 Aug 2019	10:00 ~ 11:00	0.062	0.009	0.114	0.042	0.002	1.63	163.00	SSE
18 Aug 2019	11:00 ~ 12:00	0.022	0.019	0.010	0.004	0.000	1.48	163.33	SSE
18 Aug 2019	12:00 ~ 13:00	0.002	0.004	0.011	0.004	0.025	1.20	166.00	SSE

Max	0.140	0.062	0.114	0.042	0.049
Avg	0.087	0.019	0.057	0.021	0.014
Min	0.002	0.000	0.010	0.004	0.000

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Date	Time	CO	NO_2	TSP	PM_{10}	SO_2	Wind Speed	Wind Direction	
		mg/m³	mg/m³	mg/m³	mg/m³	mg/m³	kph	Deg.	Direction
		Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly
18 Aug 2019	13:00 ~ 14:00	0.038	0.005	0.036	0.013	0.050	0.90	183.50	S
18 Aug 2019	14:00 ~ 15:00	0.117	0.003	0.029	0.011	0.000	0.78	237.50	WSW
18 Aug 2019	15:00 ~ 16:00	0.090	0.013	0.011	0.004	0.001	0.37	221.50	SW
18 Aug 2019	16:00 ~ 17:00	0.106	0.016	0.014	0.005	0.002	0.70	117.50	ESE
18 Aug 2019	17:00 ~ 18:00	0.142	0.014	0.022	0.008	0.023	0.70	117.17	ESE
18 Aug 2019	18:00 ~ 19:00	0.144	0.010	0.027	0.010	0.021	0.82	114.67	ESE
18 Aug 2019	19:00 ~ 20:00	0.058	0.009	0.054	0.020	0.019	0.55	148.33	SSE
18 Aug 2019	20:00 ~ 21:00	0.113	0.012	0.087	0.032	0.011	0.13	195.33	SSW
18 Aug 2019	21:00 ~ 22:00	0.041	0.010	0.025	0.009	0.002	0.30	168.83	S
18 Aug 2019	22:00 ~ 23:00	0.105	0.010	0.036	0.013	0.006	0.03	224.17	SW
18 Aug 2019	23:00 ~ 0:00	0.166	0.014	0.070	0.025	0.039	0.30	75.00	ENE
18 Aug 2019	0:00 ~ 1:00	0.040	0.008	0.037	0.013	0.024	0.17	143.83	SE
19 Aug 2019	1:00 ~ 2:00	0.029	0.004	0.019	0.007	0.037	0.23	109.50	ESE
19 Aug 2019	2:00 ~ 3:00	0.030	0.004	0.022	0.008	0.016	0.28	154.67	SSE
19 Aug 2019	3:00 ~ 4:00	0.017	0.004	0.032	0.012	0.002	0.15	183.67	S
19 Aug 2019	4:00 ~ 5:00	0.052	0.004	0.111	0.040	0.009	0.17	112.67	ESE
19 Aug 2019	5:00 ~ 6:00	0.036	0.004	0.117	0.043	0.016	0.18	54.67	NE
19 Aug 2019	6:00 ~ 7:00	0.001	0.004	0.466	0.170	0.000	0.08	170.83	S
19 Aug 2019	7:00 ~ 8:00	0.030	0.004	0.059	0.021	0.052	0.35	218.17	SW
19 Aug 2019	8:00 ~ 9:00	0.005	0.004	0.021	0.008	0.048	1.13	255.17	WSW
19 Aug 2019	9:00 ~ 10:00	0.010	0.004	0.014	0.005	0.035	1.37	260.83	W
19 Aug 2019	10:00 ~ 11:00	0.019	0.004	0.030	0.011	0.031	1.58	260.00	W
19 Aug 2019	11:00 ~ 12:00	0.023	0.004	0.029	0.010	0.055	1.38	260.83	W
19 Aug 2019	12:00 ~ 13:00	0.036	0.013	0.080	0.029	0.000	1.27	237.67	WSW

Max	0.166	0.016	0.466	0.170	0.055
Avg	0.060	0.007	0.060	0.022	0.021
Min	0.001	0.003	0.011	0.004	0.000

Date	Time	CO	NO_2	TSP	PM_{10}	SO_2	Wind Speed	Wind Direction	
		mg/m^3	mg/m^3	mg/m^3	mg/m^3	mg/m^3	kph	Deg.	Direction
		Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly
19 Aug 2019	13:00 ~ 14:00	0.045	0.027	0.024	0.009	0.001	1.25	248.67	WSW
19 Aug 2019	14:00 ~ 15:00	0.085	0.010	0.033	0.012	0.027	0.97	192.67	SSW
19 Aug 2019	15:00 ~ 16:00	0.125	0.028	0.055	0.020	0.010	0.95	164.50	SSE
19 Aug 2019	16:00 ~ 17:00	0.103	0.032	0.031	0.011	0.001	0.75	195.50	SSW
19 Aug 2019	17:00 ~ 18:00	0.112	0.050	0.018	0.006	0.003	0.80	166.67	SSE
19 Aug 2019	18:00 ~ 19:00	0.070	0.063	0.047	0.017	0.011	0.18	204.83	SSW
19 Aug 2019	19:00 ~ 20:00	0.034	0.054	0.019	0.007	0.000	0.08	104.17	ESE
19 Aug 2019	20:00 ~ 21:00	0.059	0.048	0.066	0.024	0.049	0.22	133.50	SE
19 Aug 2019	21:00 ~ 22:00	0.047	0.036	0.107	0.039	0.008	0.52	52.00	NE
19 Aug 2019	22:00 ~ 23:00	0.029	0.025	0.051	0.019	0.007	1.02	107.83	ESE
19 Aug 2019	23:00 ~ 0:00	0.038	0.023	0.017	0.006	0.002	0.82	115.00	ESE
19 Aug 2019	0:00 ~ 1:00	0.063	0.018	0.021	0.008	0.008	0.77	96.17	E
20 Aug 2019	1:00 ~ 2:00	0.051	0.013	0.022	0.008	0.006	0.80	124.50	SE
20 Aug 2019	2:00 ~ 3:00	0.065	0.016	0.035	0.013	0.015	0.63	105.50	ESE
20 Aug 2019	3:00 ~ 4:00	0.087	0.019	0.019	0.007	0.011	0.85	102.50	ESE
20 Aug 2019	4:00 ~ 5:00	0.104	0.028	0.065	0.024	0.008	0.47	80.50	E
20 Aug 2019	5:00 ~ 6:00	0.085	0.025	0.135	0.049	0.022	0.30	130.33	SE
20 Aug 2019	6:00 ~ 7:00	0.135	0.034	0.166	0.060	0.031	0.27	226.17	SW
20 Aug 2019	7:00 ~ 8:00	0.146	0.031	0.097	0.035	0.064	0.08	138.00	SE
20 Aug 2019	8:00 ~ 9:00	0.054	0.004	0.083	0.030	0.095	0.43	188.00	S
20 Aug 2019	9:00 ~ 10:00	0.039	0.004	0.020	0.007	0.043	0.78	186.67	S
20 Aug 2019	10:00 ~ 11:00	0.010	0.004	0.014	0.005	0.036	1.28	258.50	WSW
20 Aug 2019	11:00 ~ 12:00	0.043	0.004	0.006	0.002	0.016	1.35	246.83	WSW
20 Aug 2019	12:00 ~ 13:00	0.034	0.005	0.055	0.020	0.046	2.10	262.00	W

Max	0.146	0.063	0.166	0.060	0.095
Avg	0.069	0.025	0.050	0.018	0.022
Min	0.010	0.004	0.006	0.002	0.000

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED MJTD

APPENDIX 2: CALIBRATION CERTIFICATE OF AIR QUALITY EQUIPMENT

Certificate of Calibration

Certificate Number: EDCQP200-4.11.5

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

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

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

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

Temperature = 22°C
Relative Humidity = 30%
Atmospheric Pressure = 760 mmHg
Measurement Uncertainty Estimated @ 95% Confidence Level (k=2) using ISO 17025 guidelines.

Model	Serial Number	Calibration Date	Next Calibration Due
EPAS	914036	April 16, 2019	April 2020

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

Technician	**Supervisor**
Dan Okuniewicz	Mark Sullivan

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

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED ★ MJTD

Thilawa Special Economic Zone (Zone A)

Development Project (Operation Phase)

Appendix

Noise and Vibration Monitoring Report

August, 2019

NOISE AND VIBRATION

MONITORING REPORT

FOR DEVELOPMENT OF INDUSTRIAL AREA

THILAWA SEZ ZONE A

(OPERATION STAGE)

(BI-ANNUALLY MONITORING)

August 2019

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 A 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 conditions under the operation of industrial area in and around Thilawa SEZ Zone A, noise and vibration levels had been monitored from 13 August 2019 – 16 August 2019 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 13 August – 14 August, 2019	Noise Level	L_{Aeq}(dB)	1 (NV-1)	24 hours	On-site measurement by "Rion NL-42 sound level meter"
From 15 August – 16 August, 2019	Noise Level	L_{Aeq}(dB)	1 (NV-2)	24 hours	On-site measurement by "Rion NL-42 sound level meter"
From 14 August – 15 August, 2019	Noise Level	L_{Aeq}(dB)	1 (NV-3)	24 hours	On-site measurement by "Rion NL-42 sound level meter"
From 13 August – 14 August, 2019	Vibration Level	L_{v10} (dB)	1 (NV-1)	24 hours	On-site measurement by "Vibration Level Meter- VM-53A"
From 15 August – 16 August, 2019	Vibration Level	L_{v10} (dB)	1 (NV-2)	24 hours	On-site measurement by "Vibration Level Meter- VM-53A"
From 14 August – 15 August, 2019	Vibration Level	L_{v10} (dB)	1 (NV-3)	24 hours	On-site measurement by "Vibration Level Meter- VM-53A"

Source: Myanmar Koei International Ltd.

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})

Source: Myanmar Koei International Ltd.

2.2 Monitoring Location

The locations of noise and vibration level points are shown in Table 2.2-1. The detail of each sampling point is described below. The location of the noise and vibration monitoring points are shown in Figure 2.2-1.

Table 2.2-1 Location of Noise and Vibration Monitoring Station

Sampling Point	Coordinates	Description of Sampling Point
NV-1	N: 16°40'11.50", E: 96°16'32.00"	In front of administrative building, Thilawa SEZ Zone A
NV-2	N: 16°40'52.50", E: 96°16'55.50"	In the east of the Thilawa SEZ Zone A
NV-3	N: 16°40'46.20", E: 96°15'30.10"	In the west of the Thilawa SEZ Zone A, where is the nearest to the residential houses of Alwan sok village.

Source: Myanmar Koei International Ltd.

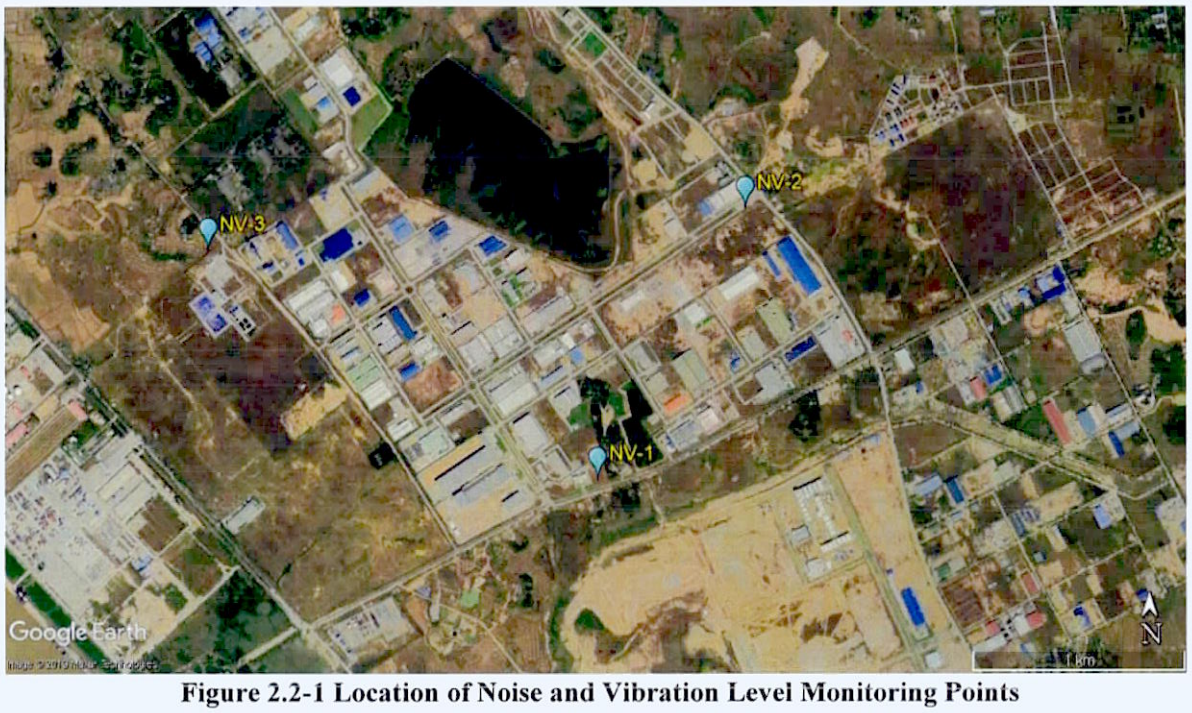


Figure 2.2-1 Location of Noise and Vibration Level Monitoring Points

NV-1
NV-1 is located in front of administrative building, Thilawa SEZ and next to Dagon-Thilawa road which is paved with moderate to highly traffic volume during the day and night by passing of loader vehicles and dump trucks. Possible sources of noise and vibration is generated from vehicle traffic during the day and nighttime.

NV-2
NV-2 is located in the east of the Thilawa SEZ Zone A, Thilawa dam in west and construction of factories in Thilawa SEZ Zone A in northwest. Possible sources of noise and vibration is generated from operation activities of Zone A's locators and road traffic. There is an access road situated in the east of NV-2.

NV-3
NV-3 is located in the west of the Thilawa SEZ Zone A, surrounded by the residential houses of Alwan sok village in north and northwest and garment factory in northeast, construction of factories in Thilawa SEZ Zone A in east respectively. Possible sources of noise and vibration is generated from operation and construction activities of surrounding Zone A's locators. In addition, daily human activities nearby Alwan sok village and road traffic might be noise and vibration sources. There is an access road situated in the northeast of NV-3.

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, (10-70) dB at NV-2, and (10-70) dB at NV-3 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, NV-2 and NV-3 are shown in Figure 2.3-1.

Source: Myanmar Koei International Ltd.

Figure 2.3-1 Status of Noise and Vibration Level Monitoring at NV-1, NV-2 and NV-3

2.4 Monitoring Results

Noise Monitoring Results

Noise monitoring results are separated daytime (6:00 AM to 10:00 PM), nighttime (10:00 PM to 6:00 AM) time frames for NV-1, 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 and NV-3. Noise measurement was carried out for one location on a 24-hour basis. The monitoring results are summarized in Table 2.4-1, Table 2.4-2, and Table 2.4-3 respectively. Hourly noise level monitoring results for NV-1, NV-2 and NV-3 are shown in Table 2.4-4, Table 2.4-5 and Table 2.4-6. Comparing with the target value of noise level in operation stage prescribed in EIA report for Thilawa SEZ development project Zone A, all results were under the target values at NV-1, NV-2 and NV-3.

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)
13 August – 14 August, 2019	61	56
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).
Source: Myanmar Koei International Ltd.

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

Date	(Commercial and Industrial Areas) 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)
15 August – 16 August, 2019	67	60	54
Target Value	70	65	60

Note: Target value is applied to the noise level during the operation stage in the EIA Report for Thilawa SEZ Development Project (Industrial Area of Zone A).
Source: Myanmar Koei International Ltd.

Table 2.4-3 Results of Noise Levels (L_{Aeq}) Monitoring at NV-3

Date	(Commercial and Industrial Areas) 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)
14 August – 15 August, 2019	52	51	49
Target Value	70	65	60

Note: Target value is applied to the noise level during the operation stage in the EIA Report for Thilawa SEZ Development Project (Industrial Area of Zone A).
Source: Myanmar Koei International Ltd.

Table 2.4-4 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
13 August – 14 August, 2019	6:00-7:00	58	61	75
	7:00-8:00	61		
	8:00-9:00	60		
	9:00-10:00	60		
	10:00-11:00	60		
	11:00-12:00	61		
	12:00-13:00	60		
	13:00-14:00	61		
	14:00-15:00	61		
	15:00-16:00	61		
	16:00-17:00	64		
	17:00-18:00	63		
	18:00-19:00	59		
	19:00-20:00	58		
	20:00-21:00	59		
	21:00-22:00	59		
	22:00-23:00	58	56	70
	23:00-24:00	59		
	24:00-1:00	58		
	1:00-2:00	57		
	2:00-3:00	54		
	3:00-4:00	52		
	4:00-5:00	54		
	5:00-6:00	54		

Source: Myanmar Koei International Ltd.

Table 2.4-5 Hourly Noise Level (L_{Aeq}) Monitoring Results at NV-2

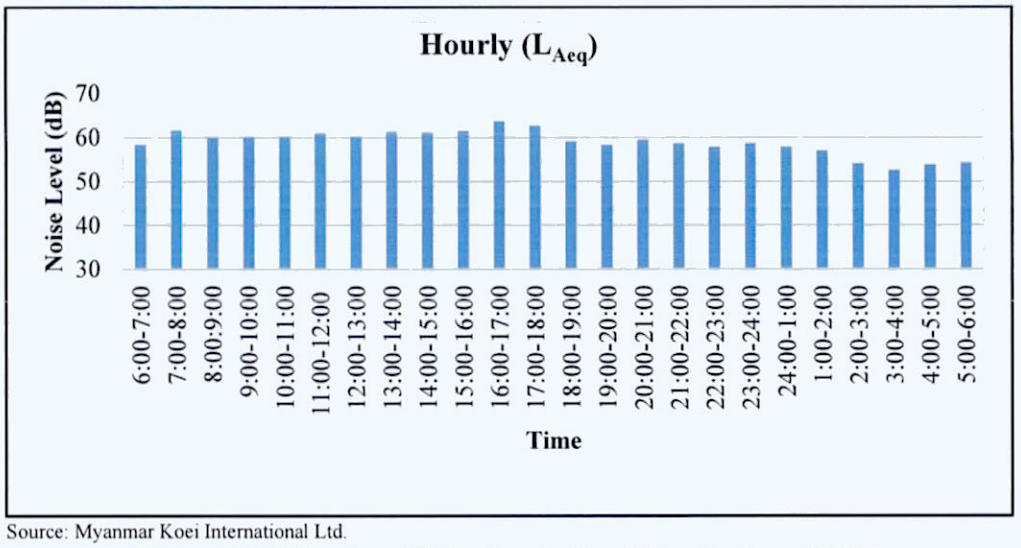
Date	Time	(L_{Aeq}, dB)	(L_{Aeq}, dB) Each Category	(L_{Aeq}, dB) Target Value
15 August – 16 August, 2019	7:00-8:00	66	67	70
	8:00-9:00	67		
	9:00-10:00	66		
	10:00-11:00	66		
	11:00-12:00	66		
	12:00-13:00	66		
	13:00-14:00	65		
	14:00-15:00	66		
	15:00-16:00	67		
	16:00-17:00	67		
	17:00-18:00	69		
	18:00-19:00	67		
	19:00-20:00	60	60	65
	20:00-21:00	62		
	21:00-22:00	57		
	22:00-23:00	58	54	60
	23:00-24:00	53		
	24:00-1:00	50		
	1:00-2:00	50		
	2:00-3:00	48		
	3:00-4:00	48		
	4:00-5:00	51		
	5:00-6:00	55		
	6:00-7:00	59		

Source: Myanmar Koei International Ltd.

Table 2.4-6 Hourly Noise Level (L_{Aeq}) Monitoring Results at NV-3

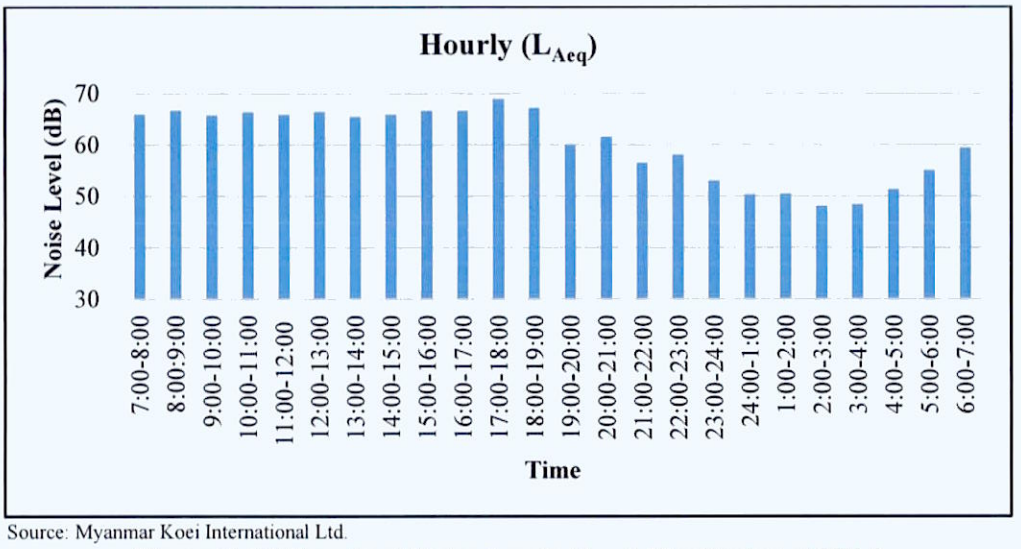
Date	Time	(L_{Aeq}, dB)	(L_{Aeq}, dB) Each Category	(L_{Aeq}, dB) Target Value
14 August – 15 August, 2019	7:00-8:00	51	52	70
	8:00-9:00	49		
	9:00-10:00	49		
	10:00-11:00	49		
	11:00-12:00	51		
	12:00-13:00	54		
	13:00-14:00	49		
	14:00-15:00	50		
	15:00-16:00	50		
	16:00-17:00	51		
	17:00-18:00	57		
	18:00-19:00	53		
	19:00-20:00	52	51	65
	20:00-21:00	51		
	21:00-22:00	49		
	22:00-23:00	50	49	60
	23:00-24:00	49		
	24:00-1:00	48		
	1:00-2:00	53		
	2:00-3:00	48		
	3:00-4:00	47		
	4:00-5:00	46		
	5:00-6:00	47		
	6:00-7:00	51		

Source: Myanmar Koei International Ltd.



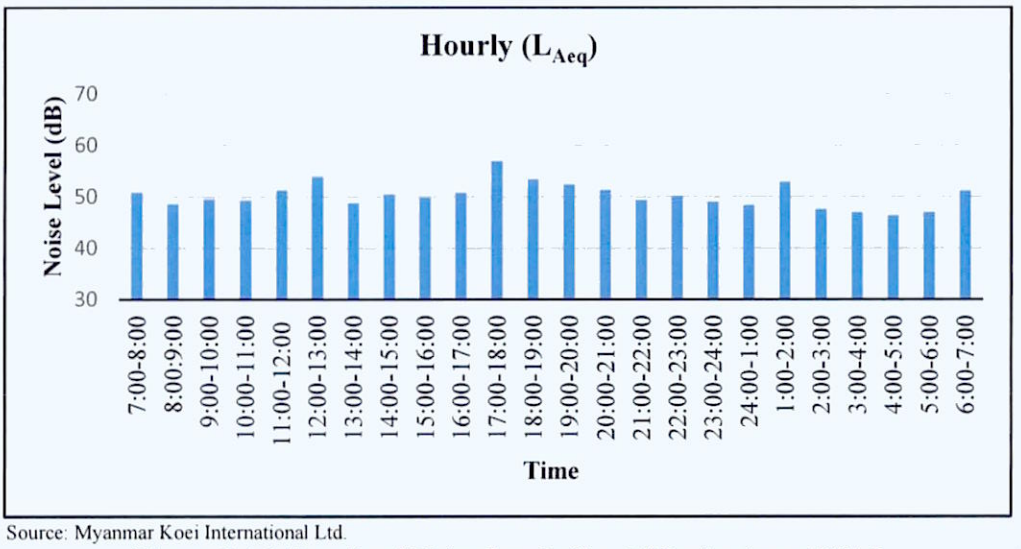
Source: Myanmar Koei International Ltd.

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



Source: Myanmar Koei International Ltd.

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



Source: Myanmar Koei International Ltd.

Figure 2.4-3 Results of Noise Levels (L_{Aeq}) Monitoring at NV-3

Vibration Monitoring Results

The results of vibration level are shown in Table 2.4-7, Table 2.4-8, and Table 2.4-9 respectively. Results of hourly vibration level monitoring for NV-1, NV-2 and NV-3 are summarized in Table 2.4-10, Table 2.4-11 and Table 2.4-12. By comparing with the target vibration level in operation stage in EIA report for Thilawa SEZ development project Zone A, all of results were under the target values.

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

Date	(Office, commercial facilities, and factories) 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)
13 August – 14 August, 2019	44	41	40
Target Value	70	65	65

Note: Target value is applied to the vibration level during the operation stage in the EIA Report for Thilawa SEZ Development Project (Industrial Area of Zone A).
Source: Myanmar Koei International Ltd.

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

Date	(Office, commercial facilities, and factories) 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)
15 August – 16 August, 2019	38	34	28
Target Value	70	65	65

Note: Target value is applied to the vibration level during the operation stage in the EIA Report for Thilawa SEZ Development Project (Industrial Area of Zone A).
Source: Myanmar Koei International Ltd.

Table 2.4-9 Results of Vibration Levels (L_{v10}) Monitoring at NV-3

Date	(Office, commercial facilities, and factories) 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)
14 August – 15 August, 2019	30	25	20
Target Value	70	65	65

Note: Target value is applied to the vibration level during the operation stage in the EIA Report for Thilawa SEZ Development Project (Industrial Area of Zone A).
Source: Myanmar Koei International Ltd.

Table 2.4-10 Results of Hourly Vibration Levels (L_{v10}) Monitoring at NV-1

Date	Time	(L_{v10}, dB)	(L_{v10}, dB) Each Category	(L_{v10}, dB) Target Value
13 August – 14 August, 2019	7:00-8:00	44	44	70
	8:00-9:00	44		
	9:00-10:00	45		
	10:00-11:00	44		
	11:00-12:00	43		
	12:00-13:00	44		
	13:00-14:00	44		
	14:00-15:00	45		
	15:00-16:00	45		
	16:00-17:00	45		
	17:00-18:00	45		
	18:00-19:00	43		
	19:00-20:00	42	41	65
	20:00-21:00	42		
	21:00-22:00	40		
	22:00-23:00	42	40	65
	23:00-24:00	41		
	24:00-1:00	42		
	1:00-2:00	40		
	2:00-3:00	38		
	3:00-4:00	37		
	4:00-5:00	38		
	5:00-6:00	37		
	6:00-7:00	41		

Source: Myanmar Koei International Ltd.

Table 2.4-11 Results of Hourly Vibration Levels (L_{v10}) Monitoring at NV-2

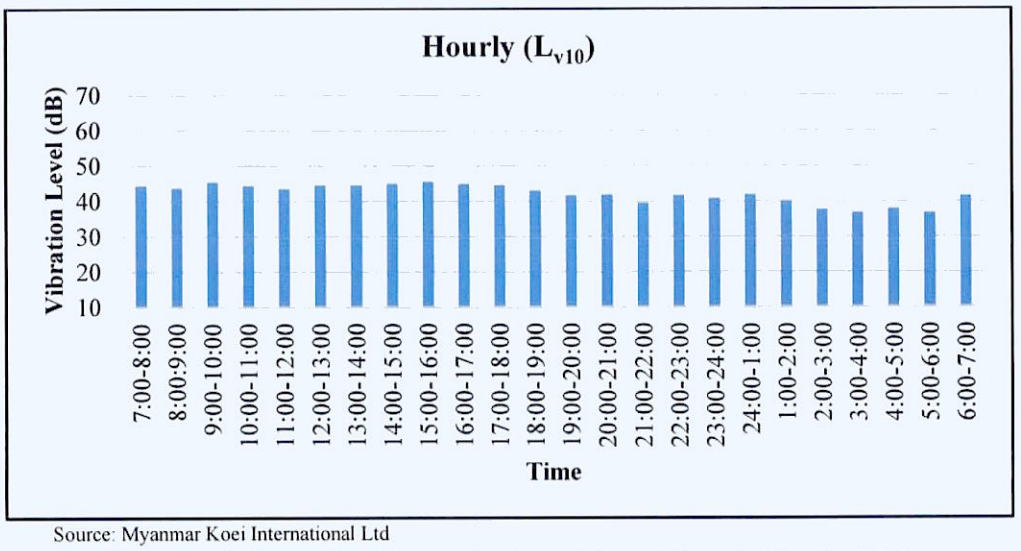
Date	Time	(L_{v10}, dB)	(L_{v10}, dB) Each Category	(L_{v10}, dB) Target Value
15 August – 16 August, 2019	7:00-8:00	39	38	70
	8:00-9:00	39		
	9:00-10:00	37		
	10:00-11:00	38		
	11:00-12:00	39		
	12:00-13:00	38		
	13:00-14:00	36		
	14:00-15:00	38		
	15:00-16:00	39		
	16:00-17:00	39		
	17:00-18:00	40		
	18:00-19:00	37		
	19:00-20:00	34	34	65
	20:00-21:00	34		
	21:00-22:00	33		
	22:00-23:00	31	28	65
	23:00-24:00	27		
	24:00-1:00	25		
	1:00-2:00	20		
	2:00-3:00	18		
	3:00-4:00	19		
	4:00-5:00	27		
	5:00-6:00	31		
	6:00-7:00	34		

Source: Myanmar Koei International Ltd.

Table 2.4-12 Results of Hourly Vibration Levels (L_{v10}) Monitoring at NV-3

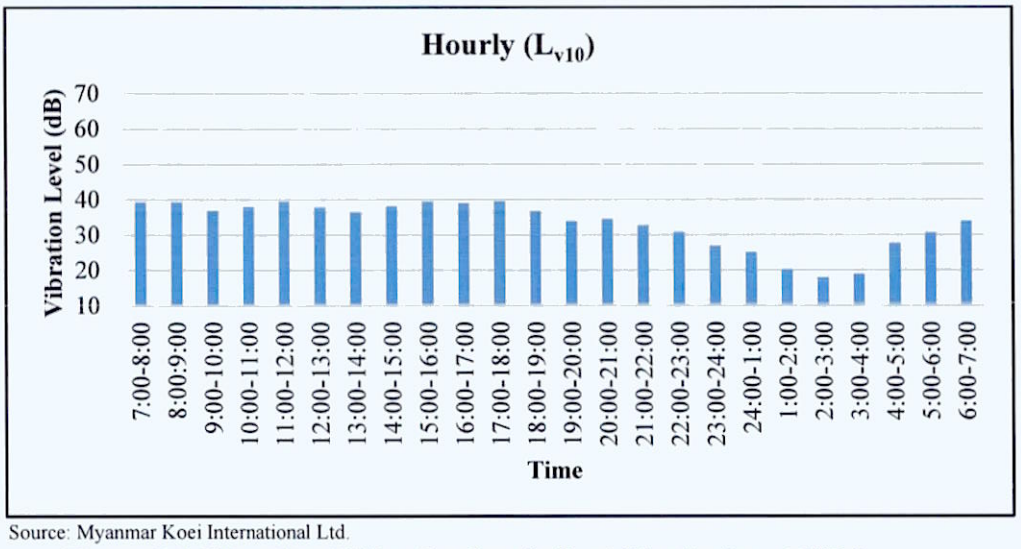
Date	Time	(L_{v10}, dB)	(L_{v10}, dB) Each Category	(L_{v10}, dB) Target Value
14 August – 15 August, 2019	7:00-8:00	27	30	70
	8:00-9:00	24		
	9:00-10:00	30		
	10:00-11:00	28		
	11:00-12:00	34		
	12:00-13:00	33		
	13:00-14:00	30		
	14:00-15:00	27		
	15:00-16:00	32		
	16:00-17:00	29		
	17:00-18:00	25		
	18:00-19:00	24		
	19:00-20:00	28	25	65
	20:00-21:00	23		
	21:00-22:00	21		
	22:00-23:00	22	20	65
	23:00-24:00	20		
	24:00-1:00	19		
	1:00-2:00	18		
	2:00-3:00	19		
	3:00-4:00	17		
	4:00-5:00	16		
	5:00-6:00	18		
	6:00-7:00	23		

Source: Myanmar Koei International Ltd.



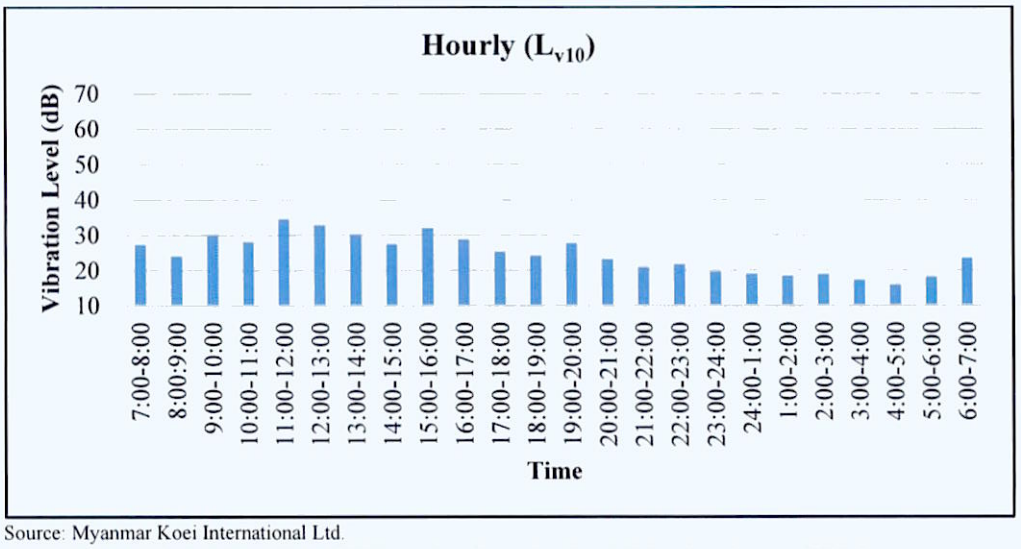
Source: Myanmar Koei International Ltd

Figure 2.4-4 Results of Vibration Levels (L_{v10}) Monitoring at NV-1



Source: Myanmar Koei International Ltd.

Figure 2.4-5 Results of Vibration Levels (L_{v10}) Monitoring at NV-2



Source: Myanmar Koei International Ltd.

Figure 2.4-6 Results of Vibration Levels (L_{v10}) Monitoring at NV-3

CHAPTER 3: CONCLUSION AND RECOMMENDATION

By comparing with the target noise and vibration level in operation stage in EIA report for Thilawa SEZ development project Zone A, all results were under the target values at NV-1, NV-2, and NV-3. (Referred to section 2.4).

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

Thilawa Special Economic Zone (Zone A)

Development Project (Operation Phase)

Appendix

Soil contamination survey in Thilawa SEZ

June, 2019

MJTD MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED

SOIL CONTAMINATION SURVEY IN THILAWA SEZ (ZONE A)

June 2019

Resource & Environment Myanmar

Resource & Environment Myanmar Ltd. B-702/401 Delta Plaza Building, Shwegondaing Rd., Bahan, Yangon. MYANMAR

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MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED ★ MJTD

Soil Contamination Survey in Thilawa SEZ (Zone-A)

Survey Item

Parameter for soil contamination survey are determined by referring to the parameter of soil content observation of Japan and other countries as shown in Table 1.

Table 1 Survey parameter for soil quality

No.	Parameter	Unit	Standard		
			Japan	Thailand	Vietnam
1	pH	-	-	-	-
2	Mercury	ppm	15	610	-
3	Arsenic	ppm	150	27	12
4	Lead	ppm	150	750	300
5	Cadmium	ppm	150	810	10
6	Copper	ppm	125	-	100
7	Zinc	ppm	150	-	300
8	Chromium	ppm	250	640	-
9	Fluoride	ppm	4000	-	-
10	Boron	ppm	4000	-	-
11	Selenium	ppm	150	10,000	-

Source: Japan: Ministry of Environment, Government of Japan (2002), "Regulation for Implementing the Law on Soil Contamination Countermeasures"
Thailand: Notification of National Environmental Board No.25, B.E. Thailand (2004), "other purpose" class"
Vietnam: QCVN 03:2008/BTNMT, Applied "industrial land', Vietnam.

Summary of survey points

The survey location is situated in Thilawa Special Economic Zone (Zone-A) areas, Thanlyin Township, Yangon. There are five samples collected for soil quality survey.

Figure 1 Location map of the soil sampling points

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The locations of survey points are shown in following table. The detail of each survey point is described below.

Table 2 Summary of survey points

Sampling Point	Coordinates	Description of Sampling Point
S-1	16° 40' 13.49" N 96° 16' 29.89" E	About 40 m northeast of administration building.
S-2	16° 40' 10.74" N 96° 16' 22.01" E	At the embankment area of the drain, near main gate of Thilawa SEZ.
S-3	16° 40' 30.25" N 96° 16' 34.86" E	At the drain from sewage treatment plant.
S-4	16° 40' 24.29" N 96° 15' 49.55" E	At damping area near retention pond.
S-5	16° 40' 32.36" N 96° 15' 49.81" E	At the drain from the retention pond.

S-1

S-1 is situated in the southern part of the Thilawa SEZ Zone (A) area, and distanced about 40 m from administration building. It was collected beside of the Trash Storage Building. Sometimes, wastewater after cleaning that domestic waste is leaked and may sink into the ground. The soil condition is fine to medium grained, reddish brown colored silty clay.

Figure 2 Soil quality sampling at S-1

S-2

S-2 was collected at the slope area of the retention canal, which is situated near the main gate of Thilawa SEZ (Zone-A). It is beside of the Thilawa SEZ car road and intended to plant the trees along the slop. The soil condition is fine to medium grained, reddish brown colored silty caly.

Figure 3 Soil quality sampling at S-2

S-3

S-3 is collected in the retention canal where wastewater from the centralized sewage treatment plant is flowing into the retention canal. It is distanced about 5 m away from the junction of wastewater discharge drainage and main rain water drainage. The soil condition is fine to medium grained, yellowish brown colored silty clay.

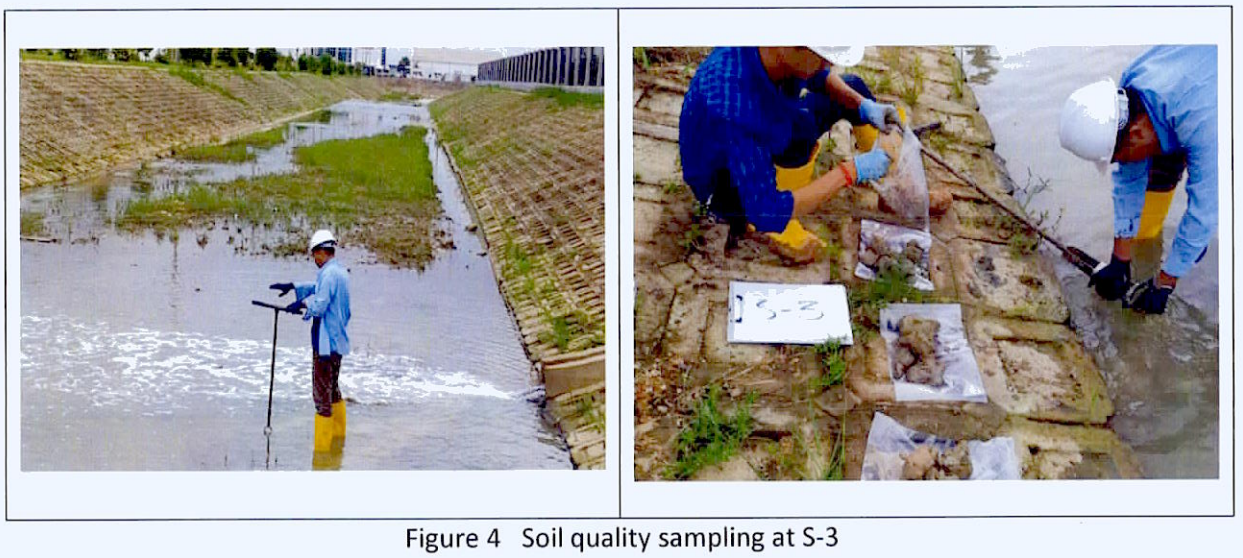

Figure 4 Soil quality sampling at S-3

S-4

S-4 is collected from the soil disposing site which is located near Plot No.E-1 of TSEZ Zone-A retention pond, about 40 m in distance. This dumping site is about 16,500 square meters where soil from Thilawa SEZ Zone-A (Phase-2). The soil condition is fine to medium grained, reddish brown colored silty caly.

Figure 5 Soil quality sampling at S-4

S-5

It is collected at the retention canal where wastewater is discharged from the retention pond of Plot No.E-1 of Thilawa SEZ Zone-A. S-5 is distanced about 100 m from this retention pond. The soil condition is fine grained, yellowish brown colored silty clay.

Figure 6 Soil quality monitoring at S-5

Survey Period

Soil sampling was carried out on 13th June 2019.

Survey Method

For soil sampling, the standard environmental sampler (soil auger) was applied. The sampler is a stainless-steel tube that is sharpened on one end and fitted with a long, T-shaped handle. This tube is approximately three inches inside diameter. In order to refrain from contamination, about 20 cm of top soil was removed by the sampler before sampling. Then sample was taken and collected in cleaned plastic bag. Chemical preservation of soil is not

generally recommended. Samples were cooled in an ice box which temperature was under 4°C. Samples were protected from sunlight to minimize any potential reaction.
Field equipment used on site are also shown in the table.

Table 3 Field Equipment for Sediment and Soil Quality Survey

No.	Equipment	Originate Country	Model
1	Soil Auger (for soil sampling)	U.S.A	AMS

The analysis method for each parameter is also shown in the following table.

Table 4 Analysis methods of soil quality

No.	Parameter	Analysis Method
1	pH	Atomic Absorption Spectrophotometer, Aqua-regia
2	Mercury (Hg)	Atomic Absorption Spectrophotometer, Aqua-regia
3	Arsenic (As)	Atomic Absorption Spectrophotometer, Aqua-regia
4	Lead (Pb)	Atomic Absorption Spectrophotometer, Aqua-regia
5	Cadmium (Cd)	Atomic Absorption Spectrophotometer, Aqua-regia
6	Copper (Cu)	Atomic Absorption Spectrophotometer, Aqua-regia
7	Zinc (Zn)	Atomic Absorption Spectrophotometer, Aqua-regia
8	Chromium (VI)	Atomic Absorption Spectrophotometer, Aqua-regia
9	Fluoride (F)	Atomic Absorption Spectrophotometer, Aqua-regia
10	Boron (B)	Atomic Absorption Spectrophotometer, Aqua-regia
11	Selenium (Se)	Atomic Absorption Spectrophotometer, Aqua-regia

Survey Result

Chemical properties for soil was analyzed in the laboratory of United Analyst and Engineering Consultant Co., Ltd. (UAE) in Thailand.
The result of soil quality analysis is presented as follow. Most of the results are complied with the proposed standard value of contamination whereas arsenic concentration at three locations are slightly higher than only Vietnam standard.

Table 4 Soil quality result

No.	Parameter	Unit	S-1	S-2	S-3	S-4	S-5	Standard		
								Japan	Thailand	Vietnam
1	pH	-	5.2	4.9	7.4	7.5	7.9	-	-	-
2	Mercury	Mg/kg	ND	ND	ND	ND	ND	15	610	-
3	Arsenic	Mg/kg	26.3	20.4	8.39	13.7	9.47	150	27	12
4	Lead	Mg/kg	18.3	13.4	16.5	16.6	13.1	150	750	300
5	Cadmium	Mg/kg	ND	ND	ND	ND	ND	150	810	10
6	Copper	Mg/kg	33.4	24.0	25.8	18.7	17.4	125	-	100
7	Zinc	Mg/kg	39.8	35.9	78.7	44.8	63.2	150	-	300
8	Chromium	Mg/kg	92.3	68.6	46.2	56.4	37.1	250	640	-
9	Fluoride	Mg/kg	ND	ND	ND	ND	ND	4000	-	-
10	Boron	Mg/kg	35.8	24.8	20.0	16.9	24.2	4000	-	-
11	Selenium	Mg/kg	0.683	0.303	ND	0.193	ND	150	10,000	-

Appendix

Lab Result

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED
MJTD

United Analyst and Engineering Consultant Co., Ltd.
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ANALYSIS REPORT

PROJECT NAME : SOIL CONTAMINATION SURVEY IN THILAWA SEZ (ZONE A)
CUSTOMER NAME : RESOURCE AND ENVIRONMENT MYANMAR CO., LTD.
ADDRESS : B702 DELTA PLAZA, SHWEGONDAING ROAD, BAHAN, YANGON, MYANMAR
CONTACT INFORMATION : TEL : +959 7301 3448 e-mail : thandartun@enviromyanmar.net
SAMPLING SOURCE : THILAWA
SAMPLE TYPE : SOIL
SAMPLING DATE : JUNE 13, 2019
SAMPLING TIME : -
SAMPLING METHOD : -
SAMPLING BY : CUSTOMER
ANALYZED BY : MISS CHOMTHANAN APHIPATPAPHA

RECEIVED DATE : JUNE 14, 2019
ANALYTICAL DATE : JUNE 14-27, 2019
REPORT NO. : 2019-U35085
WORK NO. : 2019-004400
ANALYSIS NO. : T19AH975-0001

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	DETECTION LIMIT
			S-1 T19AH975-0001	
FLUORIDE (F^-)	mg/kg (dry weight)	ION SELECTIVE ELECTRODE METHOD (U.S. EPA 1996 :9214)	ND	0.80
pH (1:1)	-	ELECTROMETRIC METHOD (U.S. EPA 2004:9045 D)	5.2 (25°C)	-
METALS				
ARSENIC (As)	mg/kg (dry weight)	ACID DIGESTION AND HYDRIDE GENERATION AAS METHOD (U.S.EPA 1996:3050 B AND 1992:7061 A)	26.3	0.100
CADMIUM (Cd)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B AND 2007:7000 B)	ND	0.300
MERCURY (Hg)	mg/kg (dry weight)	ACID DIGESTION AND COLD VAPOUR AAS METHOD (U.S.EPA 2007:7471 B)	ND	0.100
SELENIUM (Se)	mg/kg (dry weight)	ACID DIGESTION AND HYDRIDE GENERATION AAS METHOD (U.S.EPA 1996:3050 B AND 1994:7742)	0.683	0.100
CHROMIUM (Cr)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B AND 2007:7000 B)	92.3	0.500
COPPER (Cu)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B AND 2007:7000 B)	33.4	0.300
BORON (B)	mg/kg (dry weight)	ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	35.8	0.250
LEAD (Pb)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B AND 2007:7000 B)	18.3	1.55
ZINC (Zn)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B AND 2007:7000 B)	39.8	0.350
SAMPLE CONDITION			BROWN SOIL	

ND : NON-DETECTABLE.

*United Analyst Engineering Consultant Co., Ltd is Sub-contractor of REM-UAE Laboratory and Consultant Co., Ltd

(MISS BENJAWAN VIRIYOTHAI)
LABORATORY SUPERVISOR

JULY 3, 2019

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED MJTD

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ANALYSIS REPORT

PROJECT NAME : SOIL CONTAMINATION SURVEY IN THILAWA SEZ (ZONE A)
CUSTOMER NAME : RESOURCE AND ENVIRONMENT MYANMAR CO., LTD.
ADDRESS : B702 DELTA PLAZA, SHWEGONDAING ROAD, BAHAN, YANGON, MYANMAR
CONTACT INFORMATION : TEL : +959 7301 3448 e-mail : thandartun@enviromyanmar.net
SAMPLING SOURCE : THILAWA
SAMPLE TYPE : SOIL
SAMPLING DATE : JUNE 13, 2019
SAMPLING TIME : -
SAMPLING METHOD : -
SAMPLING BY : CUSTOMER
ANALYZED BY : MISS CHOMTHANAN APHIPATPAPHA

RECEIVED DATE : JUNE 14, 2019
ANALYTICAL DATE : JUNE 14-27, 2019
REPORT NO. : 2019-U36157
WORK NO. : 2019-004400
ANALYSIS NO. : T19AH975-0002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	DETECTION LIMIT
			S-2 T19AH975-0002	
FLUORIDE (F)	mg/kg (dry weight)	ION SELECTIVE ELECTRODE METHOD (U.S. EPA 1996 :9214)	ND	0.80
pH (1:1)	-	ELECTROMETRIC METHOD (U.S. EPA 2004:9045 D)	4.9 (25°C)	-
METALS				
ARSENIC (As)	mg/kg (dry weight)	ACID DIGESTION AND HYDRIDE GENERATION AAS METHOD (U.S.EPA 1996:3050 B AND 1992:7061 A)	20.4	0.100
CADMIUM (Cd)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B AND 2007:7000 B)	ND	0.300
MERCURY (Hg)	mg/kg (dry weight)	ACID DIGESTION AND COLD VAPOUR AAS METHOD (U.S.EPA 2007:7471 B)	ND	0.100
SELENIUM (Se)	mg/kg (dry weight)	ACID DIGESTION AND HYDRIDE GENERATION AAS METHOD (U.S.EPA 1996:3050 B AND 1994:7742)	0.303	0.100
CHROMIUM (Cr)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B AND 2007:7000 B)	68.6	0.500
COPPER (Cu)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B AND 2007:7000 B)	24.0	0.300
BORON (B)	mg/kg (dry weight)	ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	24.8	0.250
LEAD (Pb)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B AND 2007:7000 B)	13.4	1.55
ZINC (Zn)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B AND 2007:7000 B)	35.9	0.350
SAMPLE CONDITION			BROWN SOIL	

ND : NON-DETECTABLE.

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MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED MJTD

(MISS BENJAWAN VIRIYOTHAI)
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JULY 3, 2019

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ANALYSIS REPORT

PROJECT NAME : SOIL CONTAMINATION SURVEY IN THILAWA SEZ (ZONE A)
CUSTOMER NAME : RESOURCE AND ENVIRONMENT MYANMAR CO., LTD.
ADDRESS : B702 DELTA PLAZA, SHWEGONDAING ROAD, BAHAN, YANGON, MYANMAR
CONTACT INFORMATION : TEL : +959 7301 3448 e-mail : thandartun@enviromyanmar.net
SAMPLING SOURCE : THILAWA
SAMPLE TYPE : SOIL
SAMPLING DATE : JUNE 13, 2019
SAMPLING TIME : -
SAMPLING METHOD : -
SAMPLING BY : CUSTOMER
ANALYZED BY : MISS CHOMTHANAN APHIPATPAPHA

RECEIVED DATE : JUNE 14, 2019
ANALYTICAL DATE : JUNE 14-27, 2019
REPORT NO. : 2019-U36158
WORK NO. : 2019-004400
ANALYSIS NO. : T19AH975-0003

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	DETECTION LIMIT
			S-3 T19AH975-0003	
FLUORIDE (F)	mg/kg (dry weight)	ION SELECTIVE ELECTRODE METHOD (U.S. EPA 1996 :9214)	ND	0.80
pH (1:1)	-	ELECTROMETRIC METHOD (U.S. EPA 2004:9045 D)	7.4 (25°C)	-
METALS				
ARSENIC (As)	mg/kg (dry weight)	ACID DIGESTION AND HYDRIDE GENERATION AAS METHOD (U.S.EPA 1996:3050 B AND 1992:7061 A)	8.39	0.100
CADMIUM (Cd)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B AND 2007:7000 B)	ND	0.300
MERCURY (Hg)	mg/kg (dry weight)	ACID DIGESTION AND COLD VAPOUR AAS METHOD (U.S.EPA 2007:7471 B)	ND	0.100
SELENIUM (Se)	mg/kg (dry weight)	ACID DIGESTION AND HYDRIDE GENERATION AAS METHOD (U.S.EPA 1996:3050 B AND 1994:7742)	ND	0.100
CHROMIUM (Cr)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B AND 2007:7000 B)	46.2	0.500
COPPER (Cu)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B AND 2007:7000 B)	25.8	0.300
BORON (B)	mg/kg (dry weight)	ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	20.0	0.250
LEAD (Pb)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B AND 2007:7000 B)	16.5	1.55
ZINC (Zn)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B AND 2007:7000 B)	78.7	0.350
SAMPLE CONDITION			BROWN SOIL	

ND : NON-DETECTABLE.

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Benjawan V.
(MISS BENJAWAN VIRIYOTHAI)
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JULY 3, 2019

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ANALYSIS REPORT

PROJECT NAME : SOIL CONTAMINATION SURVEY IN THILAWA SEZ (ZONE A)
CUSTOMER NAME : RESOURCE AND ENVIRONMENT MYANMAR CO., LTD.
ADDRESS : B702 DELTA PLAZA, SHWEGONDAING ROAD, BAHAN, YANGON MYANMAR
CONTACT INFORMATION : TEL : +959 7301 3448 e-mail : thandartun@enviromyanmar.net
SAMPLING SOURCE : THILAWA
SAMPLE TYPE : SOIL
SAMPLING DATE : JUNE 13, 2019
SAMPLING TIME : -
SAMPLING METHOD : -
SAMPLING BY : CUSTOMER
ANALYZED BY : MISS CHOMTHANAN APHIPATPAPHA

RECEIVED DATE : JUNE 14, 2019
ANALYTICAL DATE : JUNE 14-27, 2019
REPORT NO. : 2019-U36159
WORK NO. : 2019-004400
ANALYSIS NO. : T19AH975-0004

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	DETECTION LIMIT
			S-4 T19AH975-0004	
FLUORIDE (F)	mg/kg (dry weight)	ION SELECTIVE ELECTRODE METHOD (U.S. EPA 1996 :9214)	ND	0.80
pH (1:1)	-	ELECTROMETRIC METHOD (U.S. EPA 2004:9045 D)	7.5 (25°C)	-
METALS				
ARSENIC (As)	mg/kg (dry weight)	ACID DIGESTION AND HYDRIDE GENERATION AAS METHOD (U.S.EPA 1996:3050 B AND 1992:7061 A)	13.7	0.100
CADMIUM (Cd)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B AND 2007:7000 B)	ND	0.300
MERCURY (Hg)	mg/kg (dry weight)	ACID DIGESTION AND COLD VAPOUR AAS METHOD (U.S.EPA 2007:7471 B)	ND	0.100
SELENIUM (Se)	mg/kg (dry weight)	ACID DIGESTION AND HYDRIDE GENERATION AAS METHOD (U.S.EPA 1996:3050 B AND 1994:7742)	0.193	0.100
CHROMIUM (Cr)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B AND 2007:7000 B)	56.4	0.500
COPPER (Cu)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B AND 2007:7000 B)	18.7	0.300
BORON (B)	mg/kg (dry weight)	ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	16.9	0.250
LEAD (Pb)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B AND 2007:7000 B)	16.6	1.55
ZINC (Zn)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B AND 2007:7000 B)	44.8	0.350
SAMPLE CONDITION			BROWN SOIL	

ND : NON-DETECTABLE.

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LABORATORY SUPERVISOR

JULY 3, 2019

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED MJTD

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ANALYSIS REPORT

PROJECT NAME : SOIL CONTAMINATION SURVEY IN THILAWA SEZ (ZONE A)
CUSTOMER NAME : RESOURCE AND ENVIRONMENT MYANMAR CO., LTD.
ADDRESS : B702 DELTA PLAZA, SHWEGONDAING ROAD, BAHAN, YANGON MYANMAR
CONTACT INFORMATION : TEL : +959 7301 3448 e-mail : thandartun@enviromyanmar.net
SAMPLING SOURCE : THILAWA
SAMPLE TYPE : SOIL
SAMPLING DATE : JUNE 13, 2019
SAMPLING TIME : -
SAMPLING METHOD : -
SAMPLING BY : CUSTOMER
ANALYZED BY : MISS CHOMTHANAN APHIPATPAPHA

RECEIVED DATE : JUNE 14, 2019
ANALYTICAL DATE : JUNE 14-27, 2019
REPORT NO. : 2019-U36161
WORK NO. : 2019-004400
ANALYSIS NO. : T19AH975-0005

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	DETECTION LIMIT
			S-5 T19AH975-0005	
FLUORIDE (F^-)	mg/kg (dry weight)	ION SELECTIVE ELECTRODE METHOD (U.S. EPA 1996 :9214)	ND	0.80
pH (1:1)	-	ELECTROMETRIC METHOD (U.S. EPA 2004:9045 D)	7.9 (25°C)	-
METALS				
ARSENIC (As)	mg/kg (dry weight)	ACID DIGESTION AND HYDRIDE GENERATION AAS METHOD (U.S.EPA 1996:3050 B AND 1992:7061 A)	9.47	0.100
CADMIUM (Cd)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B AND 2007:7000 B)	ND	0.300
MERCURY (Hg)	mg/kg (dry weight)	ACID DIGESTION AND COLD VAPOUR AAS METHOD (U.S.EPA 2007:7471 B)	ND	0.100
SELENIUM (Se)	mg/kg (dry weight)	ACID DIGESTION AND HYDRIDE GENERATION AAS METHOD (U.S.EPA 1996:3050 B AND 1994:7742)	ND	0.100
CHROMIUM (Cr)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B AND 2007:7000 B)	37.1	0.500
COPPER (Cu)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B AND 2007:7000 B)	17.4	0.300
BORON (B)	mg/kg (dry weight)	ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	24.2	0.250
LEAD (Pb)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B AND 2007:7000 B)	13.1	1.55
ZINC (Zn)	mg/kg (dry weight)	ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD (U.S.EPA 1996:3050 B AND 2007:7000 B)	63.2	0.350
SAMPLE CONDITION			BROWN SOIL	

ND : NON-DETECTABLE.

*United Analyst Engineering Consultant Co., Ltd is Sub-contractor of REM-UAE Laboratory and Consultant Co., Ltd

(MISS BENJAWAN VIRIYOTHAI)
LABORATORY SUPERVISOR

JULY 3, 2019

Thilawa Special Economic Zone (Zone A)

Development Project (Operation Phase)

Appendix

Ground Subsidence Monitoring Status

(Location- Admin Complex Compound)

April 2019 to September 2019

Ground Subsidence Monitoring Status (Operation Phase)

Location Admin Complex Compound

Coordinate Points E=209545.508 N=1844669.443

Month	Date	Predefined Level (m)-ASL	Weekly Reading Level (m)-ASL	Subsidence (m)	Remark
Jul	15-Jul-16	+7.137	+7.137	0.000	
	22-Jul-16	+7.137	+7.136	-0.001	
	29-Jul-16	+7.137	+7.136	-0.001	
Aug	5-Aug-16	+7.137	+7.136	-0.001	
	12-Aug-16	+7.137	+7.136	-0.001	
	19-Aug-16	+7.137	+7.136	-0.001	
	26-Aug-16	+7.137	+7.136	-0.001	
Sept	2-Sep-16	+7.137	+7.136	-0.001	
	9-Sep-16	+7.137	+7.136	-0.001	
	16-Sep-16	+7.137	+7.136	-0.001	
	23-Sep-16	+7.137	+7.136	-0.001	
	30-Sep-16	+7.137	+7.136	-0.001	
Oct	7-Oct-16	+7.137	+7.136	-0.001	
	14-Oct-16	+7.137	+7.136	-0.001	
	21-Oct-16	+7.137	+7.136	-0.001	
	28-Oct-16	+7.137	+7.136	-0.001	
Nov	4-Nov-16	+7.137	+7.136	-0.001	
	11-Nov-16	+7.137	+7.136	-0.001	
	18-Nov-16	+7.137	+7.136	-0.001	
	25-Nov-16	+7.137	+7.138	+0.001	
Dec	2-Dec-16	+7.137	+7.136	-0.001	
	9-Dec-16	+7.137	+7.136	-0.001	
	16-Dec-16	+7.137	+7.135	-0.002	
	23-Dec-16	+7.137	+7.133	-0.004	
	30-Dec-16	+7.137	+7.133	-0.004	
Jan	6-Jan-17	+7.137	+7.134	-0.003	
	13-Jan-17	+7.137	+7.134	-0.003	
	20-Jan-17	+7.137	+7.134	-0.003	
	27-Jan-17	+7.137	+7.134	-0.003	
Feb	3-Feb-17	+7.137	+7.134	-0.003	
	10-Feb-17	+7.137	+7.134	-0.003	
	17-Feb-17	+7.137	+7.134	-0.003	
	24-Feb-17	+7.137	+7.134	-0.003	
Mar	3-Mar-17	+7.137	+7.134	-0.003	
	10-Mar-17	+7.137	+7.134	-0.003	
	17-Mar-17	+7.137	+7.128	-0.009	After earthquake
	24-Mar-17	+7.137	+7.128	-0.009	
	31-Mar-17	+7.137	+7.128	-0.009	
Apr	7-Apr-17	+7.137	+7.128	-0.009	
	21-Apr-17	+7.137	+7.126	-0.011	
	28-Apr-17	+7.137	+7.126	-0.011	
May	5-May-17	+7.137	+7.126	-0.011	
	12-May-17	+7.137	+7.129	-0.008	
	19-May-17	+7.137	+7.131	-0.006	
	26-May-17	+7.137	+7.135	-0.002	
Jun	9-Jun-17	+7.137	+7.135	-0.002	
	16-Jun-17	+7.137	+7.134	-0.003	
	23-Jun-17	+7.137	+7.134	-0.003	
	30-Jun-17	+7.137	+7.136	-0.001	
July	7-Jul-17	+7.137	+7.136	-0.001	
	14-Jul-17	+7.137	+7.136	-0.001	
	21-Jul-17	+7.137	+7.138	+0.001	
	28-Jul-17	+7.137	+7.136	-0.001	
Aug	3-Aug-17	+7.137	+7.136	-0.001	
	10-Aug-17	+7.137	+7.137	+0.000	
	17-Aug-17	+7.137	+7.136	-0.001	
	24-Aug-17	+7.137	+7.137	+0.000	

Month	Date	Predefined Level (m)-ASL	Weekly Reading Level (m)-ASL	Subsidence (m)	Remark
Sept	1-Sep-17	+7.137	+7.136	-0.001	
	8-Sep-17	+7.137	+7.136	-0.001	
	15-Sep-17	+7.137	+7.136	-0.001	
	22-Sep-17	+7.137	+7.136	-0.001	
	29-Sep-17	+7.137	+7.136	-0.001	
Oct	2-Oct-17	+7.137	+7.136	-0.001	
	9-Oct-17	+7.137	+7.136	-0.001	
	16-Oct-17	+7.137	+7.136	-0.001	
	23-Oct-17	+7.137	+7.136	-0.001	
	30-Oct-17	+7.137	+7.136	-0.001	
Nov	6-Nov-17	+7.137	+7.136	-0.001	
	13-Nov-17	+7.137	+7.136	-0.001	
	20-Nov-17	+7.137	+7.135	-0.002	
	27-Nov-17	+7.137	+7.135	-0.002	
Dec	4-Dec-17	+7.137	+7.135	-0.002	
	11-Dec-17	+7.137	+7.135	-0.002	
	18-Dec-17	+7.137	+7.134	-0.003	
	26-Dec-17	+7.137	+7.134	-0.003	
Jan	2-Jan-18	+7.137	+7.134	-0.003	
	8-Jan-18	+7.137	+7.133	-0.004	
	15-Jan-18	+7.137	+7.133	-0.004	
	22-Jan-18	+7.137	+7.132	-0.005	
	29-Jan-18	+7.137	+7.132	-0.005	
Feb	5-Feb-18	+7.137	+7.132	-0.005	
	13-Feb-18	+7.137	+7.132	-0.005	
	19-Feb-18	+7.137	+7.132	-0.005	
	26-Feb-18	+7.137	+7.132	-0.005	
Mar	5-Mar-18	+7.137	+7.132	-0.005	
	12-Mar-18	+7.137	+7.132	-0.005	
	19-Mar-18	+7.137	+7.132	-0.005	
	26-Mar-18	+7.137	+7.130	-0.007	
Apr	2-Apr-18	+7.137	+7.130	-0.007	
	9-Apr-18	+7.137	+7.130	-0.007	
	23-Apr-18	+7.137	+7.129	-0.008	
	30-Apr-18	+7.137	+7.129	-0.008	
May	7-May-18	+7.137	+7.129	-0.008	
	14-May-18	+7.137	+7.129	-0.008	
	21-May-18	+7.137	+7.13	-0.007	
	28-May-18	+7.137	+7.13	-0.007	
June	4-Jun-18	+7.137	+7.13	-0.007	
	11-Jun-18	+7.137	+7.131	-0.006	
	18-Jun-18	+7.137	+7.131	-0.006	
	25-Jun-18	+7.137	+7.132	-0.005	
July	2-Jul-18	+7.137	+7.134	-0.003	
	9-Jul-18	+7.137	+7.134	-0.003	
	16-Jul-18	+7.137	+7.134	-0.003	
	24-Jul-18	+7.137	+7.135	-0.002	
August	3-Aug-18	+7.137	+7.135	-0.002	
	13-Aug-18	+7.137	+7.135	-0.002	
	20-Aug-18	+7.137	+7.134	-0.003	
	27-Aug-18	+7.137	+7.135	-0.002	
September	3-Sep-18	+7.137	+7.135	-0.002	
	10-Sep-18	+7.137	+7.136	-0.001	
	17-Sep-18	+7.137	+7.136	-0.001	
	28-Sep-18	+7.137	+7.136	-0.001	
October	8-Oct-18	+7.137	+7.136	-0.001	
	15-Oct-18	+7.137	+7.136	-0.001	
	20-Oct-18	+7.137	+7.136	-0.001	
	31-Oct-18	+7.137	+7.136	-0.001	
November	9-Nov-18	+7.137	+7.136	-0.001	
	16-Nov-18	+7.137	+7.136	-0.001	
	23-Nov-18	+7.137	+7.135	-0.002	

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED
MJTD

Month	Date	Predefined Level (m)-ASL	Weekly Reading Level (m)-ASL	Subsidence (m)	Remark
December	3-Dec-18	+7.137	+7.135	-0.002	
	13-Dec-18	+7.137	+7.135	-0.002	
	20-Dec-18	+7.137	+7.135	-0.002	
	27-Dec-18	+7.137	+7.135	-0.002	
January	8-Jan-19	+7.137	+7.135	-0.002	
	19-Jan-19	+7.137	+7.135	-0.002	
	26-Jan-19	+7.137	+7.135	-0.002	
February	1-Feb-19	+7.137	+7.135	-0.002	
	8-Feb-19	+7.137	+7.134	-0.003	
	15-Feb-19	+7.137	+7.134	-0.003	
	23-Feb-19	+7.137	+7.135	-0.002	
March	4-Mar-19	+7.137	+7.135	-0.002	
	16-Mar-19	+7.137	+7.136	-0.001	
	23-Mar-19	+7.137	+7.136	-0.001	
	30-Mar-19	+7.137	+7.136	-0.001	
April	8-Apr-19	+7.137	+7.134	-0.003	
	22-Apr-19	+7.137	+7.133	-0.004	
	30-Apr-19	+7.137	+7.131	-0.006	
May	3-May-19	+7.137	+7.132	-0.005	
	10-May-19	+7.137	+7.132	-0.005	
	22-May-19	+7.137	+7.131	-0.006	
	31-May-19	+7.137	+7.131	-0.006	
June	7-Jun-19	+7.137	+7.130	-0.007	
	14-Jun-19	+7.137	+7.131	-0.006	
	21-Jun-19	+7.137	+7.132	-0.005	
	28-Jun-19	+7.137	+7.132	-0.005	
July	5-Jul-19	+7.137	+7.132	-0.005	
	12-Jul-19	+7.137	+7.133	-0.004	
	24-Jul-19	+7.137	+7.133	-0.004	
	31-Jul-19	+7.137	+7.133	-0.004	
August	5-Aug-19	+7.137	+7.133	-0.004	
	12-Aug-19	+7.137	+7.134	-0.003	
	20-Aug-19	+7.137	+7.133	-0.004	
	30-Aug-19	+7.137	+7.134	-0.003	
September	6-Sep-19	+7.137	+7.135	-0.002	
	13-Sep-19	+7.137	+7.135	-0.002	
	20-Sep-19	+7.137	+7.136	-0.001	
	30-Sep-19	+7.137	+7.136	-0.001	

Thilawa Special Economic Zone (Zone A)

Development Project (Operation Phase)

Appendix

Sewage Treatment Plant Monitoring Record

April 2019 to September 2019

Monitoring Parameters Result for STP(Phase-1)

Month	Date	Outlet																																								
		pH	ORP	DO	EC	TDS	Turbidity	Temp	COD	SS	BOD	T-Coli	T-N	T-P	O&G	Color	Odor	Mercury	Zinc	Arsenic	Chromium	Cadmium	Selenium	Lead	Copper	Barium	Nickel	Silver	Iron	Cyanide	Total Cyanide	Ammonia	Hexavalent Chromium(Cr6+)	Fluoride	Total Chlorine	Free Chlorine	Sulphide	Formal-dehyde	Phenols
		Daily Parameters								Weekly Parameters						Monthly Parameters																											
Standard		6 ~ 9	-	-	-	Max 2,000	-	Max 35	Max 125	Max 50	Max 30	Max 400	Max 30	Max 2	Max 10	Max 150	Max 150	Max 0.005	Max 2	Max 0.1	Max 0.5	Max 0.03	Max 0.02	Max 0.1	Max 0.5	Max 1	Max 0.2	Max0.5	Max3.5	Max 0.1	Max 1	Max10	Max0.1	Max20	Max0.2	Max 1	Max 1	Max 1	Max 0.5
Unit		-	mv	mg/L	µs/cm	ppm	FNU	°C	ppm	ppm	ppm	MNP/100ml	ppm	ppm	ppm	-	-	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Apr	01-Apr-19	7.12	305.7	5.4	1247	625	0.4	29.99	18.5																																	
Apr	02-Apr-19	6.97	339	5.51	1188	594	2.8	30.2	14.8																																	
Apr	03-Apr-19	6.38	310.5	5.72	1039	601	2.4	29.89	13.4	2	0.07	<1.8	16.2	0.141	<3.1	5.02	1	≤0.002	≤0.002	≤0.01	≤0.002	≤0.002	≤0.01	≤0.002	≤0.002	0.208	0.006	≤0.002	0.014	< 0.002	0.017	14.9	< 0.05	1.651	0.5	0.2	0.02	0.025	< 0.002
Apr	04-Apr-19	7.1	307.9	5.69	1042	586	2.3	28.8	12.5																																	
Apr	05-Apr-19	7.26	165.2	4.52	1174	586	1.6	30.74	14.5																																	
Apr	06-Apr-19	7.21	190.6	5.18	1237	618	13.8	30.59																																		
Apr	07-Apr-19	7.09	333.8	4.92	1311	656	6.7	30.78																																		
Apr	08-Apr-19	7.31	324	4.66	1214	599	2.7	31.53	33.6																																	
Apr	09-Apr-19	7.03	248.7	3.47	1161	582	1.4	31.11	19.8																																	
Apr	10-Apr-19	7.44	139.8	5.1	1258	629	10.8	30.79	16.5	6	0.9	<1.8	13.1	0.536	<3.1																											
Apr	11-Apr-19	6.91	212.6	3.83	1244	622	12	30.65	76																																	
Apr	12-Apr-19	7.45	149.7	4.92	1173	548	10.2	29.68	58																																	
Apr	13-Apr-19	6.99	269.9	4.01	1348	674	1.3	31.12																																		
Apr	14-Apr-19	7.34	175.8	4.45	1340	670	0.7	31.29																																		
Apr	15-Apr-19	7.46	154.5	3.22	1328	663	0.5	30.16																																		
Apr	16-Apr-19	7.24	137.5	3.92	1230	586	1.6	29.36																																		
Apr	17-Apr-19	7.05	266.9	4.74	1285	643	15.4	31.43																																		
Apr	18-Apr-19	7.01	217.5	3.98	1313	658	0.2	31.29	10.4	2	0.11	<1.8	9.9	0.389	<3.1																					0.2					
Apr	19-Apr-19	6.84	181.9	4.46	1143	572	0.1	30.86	9.8																																	
Apr	20-Apr-19	7.8	203.9	4.91	1280	657	0.2	30.79																																		
Apr	21-Apr-19	6.74	174.2	6.15	1230	615	3.8	31.51																																		
Apr	22-Apr-19	7.1	152.8	5.2	1266	633	0	31.47	9.4																																	
Apr	23-Apr-19	7.4	152.4	4.39	1197	599	2.5	31.62	14.9																																	
Apr	24-Apr-19	6.95	344.2	4.5	1266	634	3.7	31.66	14.5	2	0.15	<1.8	17	0.635	<3.1																					0.7					
Apr	25-Apr-19	7.07	309.2	4.85	1141	570	1.4	31.5	31.1																																	
Apr	26-Apr-19	7.18	255.8	4.74	1183	591	7.6	31.61	25.7																																	
Apr	27-Apr-19	7.51	312.6	3.95	1237	612	6.3	31.87																																		
Apr	28-Apr-19	7.44	362.2	5.24	1246	614	4.6	31.42																																		
Apr	29-Apr-19	7.18	258.5	3.75	1279	639	1.5	31.72	46																																	
Apr	30-Apr-19	7.69	386.7	5.15	1217	609	1.7	31.62	29.1	10	0.29	<1.8	13.6	0.593	<3.1																					2.4					
May	01-May-19	7.36	210.6	4.25	1221	541	2.8	30.79																																		
May	02-May-19	7.33	206.7	3.92	1293	647	2.4	31.63	21.4																																	
May	03-May-19	7.11	196	4.54	1160	579	9	31.66	16.4																																	
May	04-May-19	6.88	218.6	3.81	1160	580	2.5	31.57																																		
May	05-May-19	7.42	207.8	4.59	1160	548	6.4	32.65																																		
May	06-May-19	7.16	103.1	2.91	1214	607	0.1	31.57	25.8																																	
May	07-May-19	6.92	221.8	2.53	1193	597	1.7	31.61	22																																	
May	08-May-19	7.39	20.9	2.36	1174	587	11.5	30.82	23.5	2	0.65	<1.8	15	0.67	<3.1	4.15	1.4	≤0.002	≤0.002	≤0.01	≤0.002	≤0.002	≤0.01	≤0.002	≤0.002	0.004	0.004	≤0.002	0.05	<0.002	0.023	3.38	<0.05	1.804	0.3	0.3	0.005	0.038	0.002
May	09-May-19	7.33	211.9	3.46	1213	562	8.7	30.34	22.5																																	
May	10-May-19	7.08	116	3.46	1132	566	25.2	30.62	23.1																																	
May	11-May-19	6.83	187.5	3.11	1001	501	2.1	31.73																																		
May	12-May-19	6.88	231.8	3.8	1072	536	0.5	31.71																																		
May	13-May-19	7.01	161.1	2.99	1075	537	2.6	31.82	24.9																																	
May	14-May-19	6.87	311.7	3.09	885	442	2.9	30.52	23																																	
May	15-May-19	6.81	355.2	2.96	1060	530	3	31.5	21	10	1.7	<1.8	13.5	0.753	<3.1																											
May	16-May-19	7.58	69.8	2.94	1131	566	3.7	31.54	12																																	
May	17-May-19	7.51	101.5	1.9	1119	559	2.1	31.78	14																																	
May	18-May-19	7.19	357.7	2.92	1114	557	3.3	31.65																																		
May	19-May-19	6.86	206.9	2.77	1138	570	2.1	31.43																																		
May	20-May-19	7.12	340.6	4.28	1143	571	2.3	31.68	14																																	
May	21-May-19	7.27	204.7	3.71	1026	463	2.7	31.55	40																																	
May	22-May-19	7.3	251	2.72	1209	605	2.6	31.89	30.1	2	2.02	<1.8	14.4	0.89	<3.1																											
May	23-May-19	7.02	216.1	3.09	1227	613	2.5	31.96	33.6																																	
May	24-May-19	7.07	209.4	3.81	1179	589	1.2	31.54	34.4																																	
May	25-May-19	7.44	217.3	2.83	1147	448	2.1	31.43																																		
May	26-May-19	7.28	156.7	3.02	1160	580	2	31.52																																		
May	27-May-19	7.25	190	2.78	1238	619	2.2	31.78	17.6																																	
May	28-May-19	6.81	192.1	3.15	1211	606	1.9	31.39	20.1																																	
May	29-May-19	7.13	80.4	2.21	1222	611	1.3	31.13	32.1	2	3.74	<1.8	13.7	0.664	<3.1																											
May	30-May-19	7.12	147.6	2.48	1270	635	3	31.07	33.4																																	
May	31-May-19	7.03	234.8	2.21	1223	612	1	30.79	29.4																																	
Jun	01-Jun-19	6.93	344.4	2.35	1109	555	1	30.69																																		
Jun	02-Jun-19	7.34	271.2	3.24	842	313	2.6	31.22																																		
Jun	03-Jun-19	7.45	114.5	1.72	1011	505	0.3	30.41	20.2																																	
Jun	04-Jun-19	7.1	276.2	1.57	1010	505	0.1	30.77	17.2																																	
Jun	05-Jun-19	7.03	289.6	1.65	976	488	0.1	31	17.6	2	0.34	< 1.8	9	0.354	< 3.1	1.99	1	≤0.002	≤0.002	≤0.01	≤0.002	≤0.002	≤0.01	≤0.002	≤0.002	0.006	0.006	≤0.002	0.068	< 0.002	0.013	0.287	< 0.05	1.66	0.3	0.2	< 0.005	0.035	0.003
Jun	06-Jun-19	7.27	240.9	2.53	734	434	0.5	30.46	15.3																																	
Jun	07-Jun-19	7.23	230.1	1.33	892	446	7	30.89	21.5																																	
Jun	08-Jun-19	6.94	291.9	1.82	897	449	0.1	31.06																																		
Jun	09-Jun-19	6.91	388.3	2.05	902	451	1.6	31.16																																		
Jun	10-Jun-19	6.93	442.1	2.16	889	444	1.1	30.75	11.3																																	
Jun	11-Jun-19	6.96	398.8	2.16	976	448	1.2	30.79	10																																	
Jun	12-Jun-19	6.91	386.3	1.21	921	447	1.6	30.71	15.7	2	1.59	23	10.4	0.392	< 3.1																					0.1					
Jun	13-Jun-19	7.05	406.2	1.21	733	366	0	30.34	11.8																																	
Jun	14-Jun-19	7.11	384.1	2.06	956	478	6	30.81	24.5																																	
Jun	15-Jun-19	7.11	312.5	1.81	1006	503	0.6	30.64																																		
Jun	16-Jun-19	7.26	396.6	1.58	990	495	0.1	30.4																																		
Jun	17-Jun-19	6.88	531.8	1.92	935	467	0.8	30.19	9.9																																	
Jun	18-Jun-19	7.07	444.6	1.63	869	434	4.3	30.37	15.8																																	
Jun	19-Jun-19	7.59	466.6	1.76	580	290	47.9	30.43	23.5	2	3.52	< 1.8	13.2	0.792	< 3.1																					0.4					
Jun	20-Jun-19	7.13	483	1.22	730	365	2.7	30.26	17.4																																	
Jun	21-Jun-19	6.97	534	2.17	731	366	0	30.05	15.2																																	
Jun	22-Jun-19	7.26	432.8	2.32	660	332	2.8	30.32																																		
Jun	23-Jun-19	7.41	410.4	1.85	867	433	6.2	31.11																																		
Jun	24-Jun-19	6.87	559	1.69	1013	507	0.4	31.35	26.3																																	
Jun	25-Jun-19	6.86	565.3	1.43	958	479	0.8	31.42	16.9																																	
Jun	26-Jun-19	7.09	438.4	2.04	862	426	21.8	31.25	26.9	2	2.07	< 1.8	9.7	0.464	< 3.1																					0.1					
Jun	27-Jun-19	6.99	481.4	2.13	862	431	1.1	30.87	21.4																																	
Jun	28-Jun-19	7.1	398.1	2.04	945	429	2.6	30.64	16.7																																	
Jun	29-Jun-19	7.2	525.4	1.57	852	426	0	30.23																																		
Jun	30-Jun-19	7.15	483.3	1.58	923	479	1.5	30.24																																		
Jul	01-Jul-19	7.6	467.9	1.65	889	445	0	29.97	9.7																																	
Jul	02-Jul-19	6.82	573.9	1.65	781	392	10.1	30.1	21.4																																	
Jul	03-Jul-19	7.08	570.3	1.29	796	398	2.3	30.15	16.3	2	0.5	< 1.8	10.6	0.344	< 3.1	3.47	1	≤0.002	0.035	≤0.01	0.002	≤0.002	≤0.01	≤0.002	≤0.002	0.01	0.008	≤0.002	0.07	< 0.002	0.004	5.08	< 0.05	0.607	0.2	0.1	< 0.005	0.021	0.004
Jul	04-Jul-19	7.26	340.3	2.24	664	356	4.5	30.36	17.4																																	
Jul	05-Jul-19	7.41	518.5	1.41	743	371	5.6	29.82	13.2																																	
Jul	06-Jul-19	6.91	577.3	1.73	833	417	1.8	30.21																																		
Jul	07-Jul-19	7.1	569.6	1.85	837	419	0.4	30.12																																		
Jul	08-Jul-19	7.09	578.5	1.43	873	415	1.7	30.1	9.9																																	
Jul	09-Jul-19	7.21	550.9	1.06	664	332	1.6	29.96	12.2																																	
Jul	10-Jul-19	6.86	586.5	1.13	594	297	3.3	29.78	13.6	2	0.4	< 1.8	6.4	0.28	< 3.1																					0.2					
Jul	11-Jul-19	7.11	573.2	1.1	520	260	3.5	29.58	13.4																																	
Jul	12-Jul-19	7.15	563.4	1.1	634	309	2.9	28.1	17.1																																	
Jul	13-Jul-19	7.29	548.2	1.28	835	418	3.2	30.1																																		
Jul	14-Jul-19	7.25	563.5	1.23	639	368	3.2	29.09																																		
Jul	15-Jul-19	7.17	509.9	1.1	590	295	5.3	29.48	11.3	6	1.48	< 1.8	6	0.379	< 3.1																					0.2					
Jul	16-Jul-19	7.24	388.5	2.13	620	317	4.9	30.24																																		
Jul	17-Jul-19	7.22	501.9	1.02	606	302	0.7	29.24	12.7																																	
Jul	18-Jul-19	6.95	574.5	1.06	575	288	0	29.4	10																																	
Jul	19-Jul-19	7.29	547.8	1.38	674	337	0.2	30.05																																		
Jul	20-Jul-19	6.83	520.5	1.22	526	372	0.3	30.16																																		
Jul	21-Jul-19	7.32	548	0.92	670	335	0.32	30.27																																		
Jul	22-Jul-19	7.23	559.8	0.93	666	333	0.9	29.66	14.2																																	
Jul	23-Jul-19	7.12	575	1.04	731	365	2	30.04	12.3																																	
Jul	24-Jul-19	7.42	443.8	2.11	725	378	10	30.57	22.7	2	1.63	< 1.8	7.1	0.335	< 3.1																					0.2					
Jul	25-Jul-19	6.89	587.9	1.12	772	386	7.7	30.19	19.4																																	
Jul	26-Jul-19	7.2	539.1	1.16	730	365	1.7	29.89	20.3																																	
Jul	27-Jul-19	7.04	576.6	1.65	655	327	20.1	29.66																																		
Jul	28-Jul-19	7.24	398.7	2.42	512	281	23	30.35																																		
Jul	29-Jul-19	7.42	560	1.06	930	465	20.2	30.45	7.6																																	
Jul	30-Jul-19	6.88	586.1	0.99	607	304	25.1	29.65	10.7																																	
Jul	31-Jul-19	7	570.5	1.33	608	304	2.5	29.22	16	2	4.62	3300	7.7	0.298	< 3.1																											
Aug	01-Aug-19	7.32	486.7	1.11	750	330	2.6	29.78	18.6																											0.1					
Aug	02-Aug-19	7.64	501.6	1.26	966	483	2.2	29.35	15																																	
Aug	03-Aug-19	6.87	566.5	1.96	1101	550	55.6	29.28																																		
Aug	04-Aug-19	6.75	578	1.11	1060	530	17.7	29.44																																		
Aug	05-Aug-19	7.1	540.9	1.22	981	480	19.3	29.16	10.7																																	

Month	Date	Outlet																																								
		Daily Parameters								Weekly Parameters						Monthly Parameters																											
Standard		6 ~ 9	-	-	-	Max 2,000	-	Max 35	Max 125	Max 50	Max 30	Max 400	Max 80	Max 2	Max 10	Max 150	Max 150	Max 0.005	Max 3	Max 0.1	Max 0.5	Max 0.03	Max 0.02	Max 0.1	Max 0.5	Max 1	Max 0.2	Max0.6	Max3.5	Max 0.1	Max 1	Max10	Max0.1	Max20	Max0.2	Max 1	Max 1	Max 1	Max 0.5
Unit		-	mv	mg/L	µs/cm	ppm	FNU	°C	ppm	ppm	ppm	MNP/100ml	ppm	ppm	ppm	-	-	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Aug	06-Aug-19	7.39	571.6	1.34	588	294	8.6	28.8	13.9																																
Aug	07-Aug-19	7.26	537.9	1.48	484	242	63.6	28.62	20.4	10	4.2	< 1.8	6.4	0.4	< 3.1	0.82	1	≤0.002	≤0.002	≤0.01	0.002	≤0.002	≤0.01	≤0.002	≤0.002	≤0.002	0.008	≤0.002	0.52	< 0.002	0.005	1.75	< 0.05	0.472	0.5	0.013	0.006	0.029	0.007
Aug	08-Aug-19	7.67	415.1	0.95	548	274	20.6	28.87	20.8																																
Aug	09-Aug-19	7.51	476.2	0.76	360	221	20.4	30.16	20.8																																
Aug	10-Aug-19	6.85	505.7	2.51	712	356	18.1	29.5																																	
Aug	11-Aug-19	7.28	513.1	1.49	664	332	14	28.9																																	
Aug	12-Aug-19	6.69	592.3	1.59	542	271	19.3	29.12	-																																
Aug	13-Aug-19	7.55	396.5	1.3	545	272	1.9	28.48	15.4																											0.7					
Aug	14-Aug-19	7.12	354.2	1.28	684	266	3.2	29.32	17	8	0.29	< 1.8	4.7	0.398	< 3.1																										
Aug	15-Aug-19	7.73	403.3	2.36	595	298	16.5	29.5	13																																
Aug	16-Aug-19	7.11	558.6	1.89	853	427	4.4	29.8	17.2																																
Aug	17-Aug-19	7.23	531.9	1.72	826	418	4.2	30.19																																	
Aug	18-Aug-19	7.59	499.4	2.72	898	449	13.3	30.06																																	
Aug	19-Aug-19	7.42	488.9	2.79	750	375	8.6	29.24	13.9																																
Aug	20-Aug-19	7.14	512.9	2.16	731	366	12.2	29.67	18.7																																
Aug	21-Aug-19	7.6	456.2	2.12	763	329	12.4	29.08	14.1	8	5.07	< 1.8	7.0	0.435	< 3.1																										
Aug	22-Aug-19	7.46	502.4	1.96	617	308	16.2	29.46	19.1																																
Aug	23-Aug-19	7.38	522.3	1.87	748	374	53.3	29.62	19.2																																
Aug	24-Aug-19	7.37	477.8	1.47	677	367	22.6	29.78																																	
Aug	25-Aug-19	7.4	475.9	1.35	665	342	20.4	29.49																																	
Aug	26-Aug-19	7.57	204.2	3.55	669	334	2.3	29.56	10.7																																
Aug	27-Aug-19	7.06	418.2	2.09	711	356	19.8	29.34	14.7																																
Aug	28-Aug-19	7.34	248.4	3.24	803	402	2.7	29.53	24.7	2	2.6	< 1.8	7	1.03	< 3.1																										
Aug	29-Aug-19	7.56	227.8	3.12	790	514	2.2	29.98	23.5																																
Aug	30-Aug-19	7.49	458.1	1.76	868	434	15.1	29.95	21.5																																
Aug	31-Aug-19	7.24	421.1	1.61	861	534	15.4	29.95																																	
Sep	01-Sep-19	7.26	398.2	1.66	885	534	15.7	28.75																																	
Sep	02-Sep-19	7.15	389.4	1.56	892	544	14.3	30.04	18.5																																
Sep	03-Sep-19	7.44	387.5	1.68	608	304	26	29.21	19.8																																
Sep	04-Sep-19	7.16	389.8	3.12	717	358	10.3	29.26	10.2	2	0.41	< 1.8	9.8	0.386	< 3.1																										
Sep	05-Sep-19	7.62	413.7	2.18	676	338	13	29.36	15.7																																
Sep	06-Sep-19	7.31	425.2	1.52	737	368	15.3	29.18	28.8																																
Sep	07-Sep-19	7.31	433.7	1.87	660	330	6.9	29.12																																	
Sep	08-Sep-19	7.23	423.8	1.86	650	350	6.8	30.13																																	
Sep	09-Sep-19	7.2	404.5	2.08	633	317	12.3	29.26	26.4																																
Sep	10-Sep-19	7.45	376.8	1.99	703	352	5.7	29.17	12.5																																
Sep	11-Sep-19	7.43	233	1.41	677	339	-	29.13	17.2	4	5.14	< 1.8	7.4	0.299	< 3.1	2.47	2	≤0.002	0.032	≤0.01	≤0.002	≤0.002	≤0.01	≤0.002	≤0.002	0.002	0.004	≤0.002	0.146	< 0.002	0.003	5.87	< 0.05	0.959	0.4	0.4	< 0.005	0.026	< 0.002
Sep	12-Sep-19	7.06	355	1.39	615	308	-	28.99	21.1																																
Sep	13-Sep-19	7.12	438.1	1.18	556	278	11.6	28.75	23.8																																
Sep	14-Sep-19	7.16	405.4	0.95	568	284	3.3	29.13																																	
Sep	15-Sep-19	7.05	419.2	0.93	582	292	4.4	29.14																																	
Sep	16-Sep-19	7.1	430.6	0.84	590	289	4.9	21.12	33.9																																
Sep	17-Sep-19	7.06	433.9	1.22	767	393	13.9	29.74	26.8																																
Sep	18-Sep-19	-	-	-	-	-	-	-	21.6	2	5.75	< 1.8	9.3	0.475	< 3.1																										
Sep	19-Sep-19	7.52	378.5	1.42	890	445	4.5	30.41	32.8																																
Sep	20-Sep-19	7.7	403.3	1.48	676	438	0.6	30.3	21.1																																
Sep	21-Sep-19	7.58	380.7	1.47	819	409	2.2	-																																
Sep	22-Sep-19	7.49	382.6	1.57	824	410	2.1	30.32																																
Sep	23-Sep-19	6.97	389.6	1.41	662	131	4	30.13	26.5																																
Sep	24-Sep-19	7.67	356.1	1.3	857	429	3.5	30.47	24.9																																
Sep	25-Sep-19	7.31	151.6	2.79	855	427	1.5	30.47	16.1	2	4	< 1.8	9.3	0.475	< 3.1																										
Sep	26-Sep-19	7.56	338.3	1.57	819	410	-	30.55	12.7																																
Sep	27-Sep-19	7.45	282.1	2.72	772	386	9.3	30.72	48																																
Sep	28-Sep-19	7.65	368.2	1.42	734	367	1	30.62																																
Sep	29-Sep-19	7.43	356.4	1.32	732	364	1	31.42																																
Sep	30-Sep-19	7.1	347.8	1.43	741	334	2.1	30.13	24.4																																

MYANMAR JAPAN THILAWA DEVELOPMENT MJTD

Monitoring Parameters Result for STP(Phase-1)

Inlet

Month	Date	pH	ORP	DO	EC	TDS	Turbidity	Temp	COD
		Daily Parameters							
Standard		6 - 9	-	-	-	Max 2,000	-	Max 35 °C	Max 400
Unit		-	mv	mg/L	µs/cm	ppm	FNU	°C	ppm
Apr	01-Apr-19	7.22	85.6	4.6	848	424	167	29.94	49
Apr	02-Apr-19	7.23	159.9	4.28	1189	594	294	30.19	51
Apr	03-Apr-19	7.1	147.2	4.5	1017	498	279	30.27	50
Apr	04-Apr-19	7.13	158.7	4.65	1175	574	189	29.84	109
Apr	05-Apr-19	7.35	47.8	3.61	950	475	33.8	30.56	59
Apr	06-Apr-19	6.92	151.1	4.45	1257	628	14.9	30.34	
Apr	07-Apr-19	7.09	152.2	34.06	731	366	19	30.55	
Apr	08-Apr-19	6.87	145.8	2.16	1116	559	14.6	30.53	67
Apr	09-Apr-19	7.35	136.1	2.84	1254	627	12	30.81	37
Apr	10-Apr-19	7.28	111	4.56	721	360	22.1	30.15	37
Apr	11-Apr-19	7.14	79.3	2.94	806	403	32.5	30.75	435
Apr	12-Apr-19	7.29	135.3	4.44	815	356	30.5	30.73	75
Apr	13-Apr-19	7.33	134.4	4.05	1614	806	16.7	31.54	
Apr	14-Apr-19	7.07	121.5	3.45	765	383	14.5	30.52	
Apr	15-Apr-19	7.4	130.2	3.44	943	381	15.7	30.48	
Apr	16-Apr-19	7.45	132.3	2.27	843	408	17.8	29.25	
Apr	17-Apr-19	6.99	210.3	4.69	852	426	12.3	30.75	
Apr	18-Apr-19	7.14	147.8	3.05	627	313	21.3	30.48	16
Apr	19-Apr-19	6.92	161.5	4.86	1004	502	21.5	30.51	26
Apr	20-Apr-19	6.95	135.6	4.76	842	514	20.7	29.77	
Apr	21-Apr-19	6.81	146	5.71	781	390	19.5	30.77	
Apr	22-Apr-19	6.8	163.9	4.37	572	286	17.8	30.49	19
Apr	23-Apr-19	7.53	89.6	0.41	1639	819	46.4	31.27	116
Apr	24-Apr-19	6.58	143.7	2.14	1126	669	14.6	31.42	51
Apr	25-Apr-19	6.85	62.9	4.1	1519	759	25.1	31.64	52
Apr	26-Apr-19	6.96	89.5	3.72	994	491	32.7	31.15	67
Apr	27-Apr-19	7.12	79.7	3.48	843	445	35.1	31.47	
Apr	28-Apr-19	7.86	85.6	2.48	761	564	28.9	31.41	
Apr	29-Apr-19	7.69	173.3	4.06	984	492	31.8	31.46	42
Apr	30-Apr-19	6.31	16.1	4.31	1296	648	88.8	31.49	147
May	01-May-19	6.21	120.6	4.33	661	536	32.8	31.24	
May	02-May-19	7.1	102.7	3.28	1522	761	31.1	32.23	73
May	03-May-19	7.33	100.1	2.42	801	402	13.7	32.03	54
May	04-May-19	7.23	85.7	2.69	1385	693	14.9	32.05	
May	05-May-19	7.1	96.5	4.24	1246	523	14.5	31.23	
May	06-May-19	6.7	87	2.29	1543	772	10.1	31.79	51
May	07-May-19	7.03	103.6	2.2	715	358	14.3	31.69	174
May	08-May-19	7.45	-19.9	2.13	1251	625	15.1	30.81	74
May	09-May-19	7.23	84.2	2.32	638	564	13.7	31.55	76
May	10-May-19	6.99	47.8	2.07	751	376	48.8	31.64	99
May	11-May-19	7.05	104.7	2.72	1621	814	10.3	32.08	
May	12-May-19	6.95	146.4	2.59	861	431	11.6	32.63	
May	13-May-19	6.99	130.1	2.71	1187	593	8.9	31.68	69
May	14-May-19	6.99	297.3	3.26	1038	519	18.7	32.64	74
May	15-May-19	7.03	262.8	2	941	470	17.9	31.74	339
May	16-May-19	7.97	61.5	2.05	991	495	39	31.86	49
May	17-May-19	7.28	123	1.41	1168	584	20.6	31.91	74
May	18-May-19	7.19	360.5	1.53	1528	764	64.5	32.59	
May	19-May-19	7.06	1554.5	2.03	1552	776	10.1		
May	20-May-19	6.88	326.9	3.77	695	348	17.5	31.45	133
May	21-May-19	6.66	230.8	3.34	664	428	17.8	31.36	44
May	22-May-19	7.04	354.6	2.9	848	424	45.5	32.03	48
May	23-May-19	7.16	176.6	2.61	920	412	18.5	31.62	95
May	24-May-19	6.98	183.7	2.65	1385	692	11.7	32.07	56
May	25-May-19	7.02	168.5	2.79	743	421	12.8	31.31	
May	26-May-19	7	197.5	2.72	1239	620	32.6	31.49	
May	27-May-19	7.27	189.7	2.25	1140	570	39.5	31.63	277
May	28-May-19	6.85	179.6	2.73	1410	705	12.3	31.93	99
May	29-May-19	7.14	62.4	2.49	823	412	67.1	31.22	86
May	30-May-19	7	149.8	2.3	932	466	30.1	31.33	234
May	31-May-19	7.07	200.2	1.78	991	496	23.3	31.66	41
Jun	01-Jun-19	6.96	310.5	2	1056	528	13.7	31.39	
Jun	02-Jun-19	7.15	220.4	1.87	642	419	11.2	30.43	
Jun	03-Jun-19	7.36	122.8	1.63	611	305	39.5	30.8	50
Jun	04-Jun-19	7.24	116.2	1.3	818	401	40.8	31.3	129
Jun	05-Jun-19	7.05	258.8	1.32	1035	517	11.3	31.56	135
Jun	06-Jun-19	6.95	197.3	1.54	1160	580	74.2	31.34	213
Jun	07-Jun-19	7.07	267.9	1.19	581	291	8.9	31.2	134
Jun	08-Jun-19	6.94	198.8	1.43	734	367	16.4	31.24	
Jun	09-Jun-19	6.87	218.5	2.25	913	457	16.8	31.29	
Jun	10-Jun-19	6.91	224.3	2.36	841	331	22.5	30.64	27
Jun	11-Jun-19	6.96	435.4	2.26	859	429	0.7	30.67	64
Jun	12-Jun-19	6.87	218.5	1.63	1022	415	16.8	30.62	35
Jun	13-Jun-19	7.01	460.7	0.94	574	287	14.3	31.41	168
Jun	14-Jun-19	7.17	371.4	1.45	465	314	15.7	31.38	29
Jun	15-Jun-19	7.02	394.3	1.45	634	317	18.8	31.03	
Jun	16-Jun-19	7.04	388	1.13	541	270	18.2	31.09	
Jun	17-Jun-19	6.87	514.4	1.57	565	283	67.8	30.67	222
Jun	18-Jun-19	7.21	340.7	2.2	474	227	18.7	30.59	50
Jun	19-Jun-19	7.06	456.3	1.46	596	298	18.6	30.72	40
Jun	20-Jun-19	7.15	433.9	1.52	555	277	93.8	30.4	24
Jun	21-Jun-19	7.15	470	2.02	826	413	21	30.88	102
Jun	22-Jun-19	7.24	350.6	2.12	642	325	19.4	30.56	
Jun	23-Jun-19	7.11	478.7	1.68	1052	526	23.2	31.19	
Jun	24-Jun-19	6.75	419.8	1.63	622	311	27.2	30.82	110
Jun	25-Jun-19	6.99	492.4	1.05	520	260	18.9	31.52	93
Jun	26-Jun-19	7.42	355.1	1.96	673	337	15.6	31.2	38
Jun	27-Jun-19	6.74	549.7	1.61	592	296	22.7	31.43	31
Jun	28-Jun-19	6.79	310.3	1.63	468	321	21.3	30.42	225
Jun	29-Jun-19	7.23	475	1.17	916	458	61	30.69	
Jun	30-Jun-19	6.69	382	1.05	634	324	15.4	30.65	
Jul	01-Jul-19	7.29	548.4	1.6	448	224	104	29.88	86
Jul	02-Jul-19	7.09	469.6	1.21	651	326	40.1	30.5	26
Jul	03-Jul-19	7.25	517.4	1.25	999	499	40.4	30.66	143
Jul	04-Jul-19	7.34	432.6	2.14	534	230	34.5	30.54	121
Jul	05-Jul-19	7.42	513.2	2.16	682	392	40.1	30.64	27.4
Jul	06-Jul-19	6.91	526.8	1.5	736	368	24	30.54	
Jul	07-Jul-19	7.13	532.9	1.56	729	365	19.2	30.38	
Jul	08-Jul-19	7.14	542.8	1.59	692	372	18.3	31.27	27.2
Jul	09-Jul-19	7.26	598.3	1.21	694	356	34.6	30.64	85
Jul	10-Jul-19	6.86	586.5	1.13	594	297	3.3	29.78	76
Jul	11-Jul-19	7.22	535	1.07	602	159	19.3	30.08	21.5
Jul	12-Jul-19	7.26	542.9	1.12	598	328	18.4	31.2	133
Jul	13-Jul-19	7.4	548.2	2.16	586	238	32.1	30.64	
Jul	14-Jul-19	7.39	543.5	2.18	536	235	32.5	30.15	
Jul	15-Jul-19	7.25	489.2	1.03	610	305	47	29.07	18.4
Jul	16-Jul-19	7.26	372.1	2.24	474	254	22.4	30.49	
Jul	17-Jul-19	7.32	436.4	2.16	648	362	40.1	30.56	18.4
Jul	18-Jul-19	6.91	552.3	0.95	461	231	8.9	30.08	18.7
Jul	19-Jul-19	7.35	522.4	0.97	601	300	10.1	30.18	
Jul	20-Jul-19	7.27	472.1	1.03	519	410	9.4	30.24	
Jul	21-Jul-19	7.08	491.3	0.78	914	457	115	30.33	
Jul	22-Jul-19	7.15	480.3	0.78	813	407	11.2	30.26	34.8
Jul	23-Jul-19	7.17	550.7	1	817	408	10.6	30.41	45
Jul	24-Jul-19	7.29	490.1	2.01	630	386	12.4	30.65	45
Jul	25-Jul-19	7	562.1	0.92	610	305	42	30.38	91
Jul	26-Jul-19	7.11	528.3	1.03	704	352	38.5	30.18	36
Jul	27-Jul-19	7.16	542.6	1.25	510	255	42.8	29.61	
Jul	28-Jul-19	6.86	471.3	2.36	446	264	26.3	30.21	
Jul	29-Jul-19	6.94	576.4	3.29	568	368	24.2	30.29	19.9
Jul	30-Jul-19	6.88	558.3	0.89	514	257	18.7	29.65	34.1
Jul	31-Jul-19	7.15	553.1	1.24	502	251	23.2	30.06	42
Aug	01-Aug-19	7.02	532.8	1.26	716	365	13.2	29.26	21.1
Aug	02-Aug-19	7.64	532.7	0.95	545	273	47.3	29.68	39
Aug	03-Aug-19	6.9	547.7	1.71	430	255	45.9	29.49	
Aug	04-Aug-19	6.96	546.1	1.1	418	239	34.6	29.91	
Aug	05-Aug-19	6.76	538.2	1.16	391	248	37.8	30.89	21

Month	Date	SS	BOD	T-Coli	T-N	T-P	O&G
		Weekly Parameters					
Standard		Max 200	Max 200	-	Max 80	Max8	Max 40
Unit		ppm	ppm	MPN/100ml	ppm	ppm	ppm
Apr	03-Apr-19	8	17.73	>160000	14.9	1.39	<3.1
Apr	10-Apr-19	24	11.2	>160000	15.8	2.13	<3.1
Apr	18-Apr-19	20	3.2	>160000	4.4	0.366	<3.1
Apr	24-Apr-19	16	12.96	>160000	17	1.27	<3.1
Apr	30-Apr-19	66	28.51	>160000	11.3	1.32	<3.1
May	08-May-19	22	28.9	>160000	16.6	1.25	<3.1
May	15-May-19	66	56.02	>160000	17.2	2.6	<3.1
May	22-May-19	16	23.36	>160000	14.6	1.67	<3.1
May	29-May-19	54	16.5	>160000	9.5	0.961	<3.1
Jun	05-Jun-19	70	57.83	>160000	16.1	1.19	< 3.1
Jun	12-Jun-19	32	12.97	>160000	10.1	0.986	< 3.1
Jun	19-Jun-19	54	70.9	> 160000	13	0.8	< 3.1
Jun	26-Jun-19	30	7.2	> 160000	13	1.13	< 3.1
Jul	03-Jul-19	38	70.49	>160000	8.2	1.65	< 3.1
Jul	10-Jul-19	18	30.38	>160000	8.7	1.13	< 3.1
Jul	15-Jul-19	48	4.9	>160000	7.5	0.578	< 3.1
Jul	24-Jul-19	32	10.62	>160000	7.6	1.72	< 3.1
Jul	31-Jul-19	20	24.25	>160000	11.3	1.1	< 3.1

Month	Date	Color	Odor	Mercury	Zinc	Arsenic	Chromium	Cadmium	Selenium	Lead	Copper	Barium	Nickel	Silver	Iron	Cyanide	Total Cyanide	Ammonia	Hexavalent Chromium (Cr6+)	Fluoride	Free Chlorine	Sulphide	Formal-dehyde	Phenols	Total Chlorine
		Monthly Parameters																							
Standard		150	150	Max 0.005	Max 2	Max 0.1	Max 0.5	Max 0.03	Max 0.02	Max 0.1	Max 0.5	Max 1	Max 0.2	Max0.5	Max3.5	Max 0.1	Max1	Max30	Max0.1	Max20	Max 1	Max 1	Max 1	Max 0.5	Max0.2
Unit		Co-Pt	Co-Pt	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Apr	03-Apr-19	8.21	1.4	≤0.002	≤0.002	≤0.01	≤0.002	≤0.002	≤0.01	≤0.002	≤0.002	0.014	0.006	≤0.002	1.646	< 0.002	0.01	15.8	< 0.05	0.76	< 0.1	0.025	0.11	0.017	0.1
Apr	18-Apr-19																								0.1
Apr	24-Apr-19																								0.1
Apr	30-Apr-19																								< 0.1
May	08-May-19	8.82	1	≤0.002	0.048	≤0.01	≤0.002	≤0.002	≤0.01	≤0.002	≤0.002	0.022	0.012	≤0.002	3.242	<0.002	0.046	17.6	<0.05	1.207	0.1	0.015	0.092	0.02	0.1
Jun	05-Jun-19	9.54	1.4	≤0.002	≤0.002	≤0.01	0.006	≤0.002	≤0.01	≤0.002	≤0.002	0.046	0.016	≤0.002	3.556	< 0.002	0.009	20.2	< 0.05	0.331	0.1	0.099	0.216	0.035	0.1
Jun	12-Jun-19																								0.1
Jun	19-Jun-19																								0.1
Jun	26-Jun-19																								0.1
Jul	03-Jul-19	2.28	1.4	≤0.002	0.056	≤0.01	0.002	≤0.002	≤0.01	≤0.002	≤0.002	0.008	0.008	≤0.002	0.08	< 0.002	0.009	5	< 0.05	0.689	0.1	< 0.005	0.036	0.009	0.1
Jul	10-Jul-19																				0.1				
Jul	15-Jul-19																								0.1
Jul	24-Jul-19																								0.1
Jul	31-Jul-19																				0.1				

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Month	Date	Inlet																																								
		pH	ORP	DO	EC	TDS	Turbidity	Temp	COD	SS	BOD	T-Coli	T-N	T-P	O&G	Color	Odor	Mercury	Zinc	Arsenic	Chromium	Cadmium	Selenium	Lead	Copper	Barium	Nickel	Silver	Iron	Cyanide	Total Cyanide	Ammonia	Hexavalent Chromium (Cr6+)	Fluoride	Free Chlorine	Sulphide	Formal-dehyde	Phenols	Total Chlorine
		Daily Parameters								Weekly Parameters						Monthly Parameters																										
Standard		6 ~ 9	-	-	-	Max 2,000	-	Max 35 °C	Max 400	Max 200	Max 200	-	Max 80	Max5	Max 40	150	150	Max 0.005	Max 2	Max 0.1	Max 0.5	Max 0.03	Max 0.02	Max 0.1	Max 0.5	Max 1	Max 0.2	Max0.5	Max3.5	Max 0.1	Max1	Max80	Max0.1	Max20	Max 1	Max 1	Max 1	Max 0.5	Max0.2
Unit		-	mv	mg/L	µs/cm	ppm	FNU	°C	ppm	ppm	ppm	MPN/100ml	ppm	ppm	ppm	Co-Pt	Co-Pt	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Aug	06-Aug-19	6.96	563.2	2.19	498	348	38.8	30.69	57																															
Aug	07-Aug-19	7.23	512.6	1.42	411	205	56.7	28.89	22.4	34	45.87	>160000	6.3	0.691	< 3.1	2.76	1.4	≤0.002	0.07	≤0.01	0.004	≤0.002	≤0.01	≤0.002	0.004	0.022	0.024	≤0.002	2.824	< 0.002	0.002	6.09	< 0.05	0.238	< 0.1	0.056	0.072	0.011	< 0.1
Aug	08-Aug-19	7.68	425	0.98	390	195	22.1	29.35	25.9																															
Aug	09-Aug-19	7.6	391.3	1.12	506	230	19.8	29.28	37.6																															
Aug	10-Aug-19	7.38	548.2	2.16	589	238	32.1	30.64																																
Aug	11-Aug-19	7.43	535.6	1.28	447	223	6.2	29.23																																
Aug	12-Aug-19	6.78	558	1.58	410	205	56.2	29.37	-																															
Aug	13-Aug-19	7.71	386.3	1.19	672	336	29	29.53	43																															
Aug	14-Aug-19	7.32	346.2	1.18	668	490	28.2	30.22	20.3	26	37.22	>160000	5.4	0.606	< 3.1																									< 0.1
Aug	15-Aug-19	7.5	462.2	1.95	598	299	20.2	29.54	37																															
Aug	16-Aug-19	7.25	533.4	1.63	562	281	21.8	29.86	206																															
Aug	17-Aug-19	7.12	511.6	1.68	538	276	20.4	29.28																																
Aug	18-Aug-19	7.4	548.2	2.16	596	296	32	30.15																																
Aug	19-Aug-19	7.09	537.6	1.95	419	209	14.8	29.67	28																															
Aug	20-Aug-19	7.71	469.6	2.04	775	387	32.9	29.92	18.7																															
Aug	21-Aug-19	7.86	501.4	2.14	723	300	25.6	29.18	115	Use New Schedule (rev:03)																															
Aug	22-Aug-19	7.68	408.2	2.12	798	406	26.4	30.32	-																															
Aug	23-Aug-19	7.29	498.4	1.74	621	311	20.3	29.92	-																															
Aug	24-Aug-19	7.16	475.0	1.57	609	305	42.5	29.77																																
Aug	25-Aug-19	7.15	465.7	1.56	619	306	40.3	30.67																																
Aug	26-Aug-19	7.13	510.3	1.62	798	376	20.9	30.31	-																															
Aug	27-Aug-19	7.1	404.6	1.94	805	402	23.4	29.87	-																															
Aug	28-Aug-19	7.13	248.9	2.88	610	305	20.1	30.07	93																															
Aug	29-Aug-19	6.97	240.3	2.26	580	284	19.6	30.18	-																															
Aug	30-Aug-19	7.2	362.1	1.03	628	312	22.4	30.38	-																															
Aug	31-Aug-19	7.25	365.2	2.03	873	436	13.8	30.01																																
Sep	01-Sep-19	7.24	386.4	2.07	788	563	13.2	29.07																																
Sep	02-Sep-19	7.2	374.6	2.1	764	542	13.6	28.07	-																															
Sep	03-Sep-19	7.34	370.8	1.65	493	247	26.3	29.19	-																															
Sep	04-Sep-19	7.46	343.2	3.18	721	360	8.2	29.96	39																															
Sep	05-Sep-19	7.47	403.5	1.79	456	228	13.9	29.41	-																															
Sep	06-Sep-19	7.28	417.8	1.6	700	350	10.9	29.53	-																															
Sep	07-Sep-19	7.42	518.2	1.5	798	416	19.2	29.32																																
Sep	08-Sep-19	7.46	517.4	1.53	797	417	19.3	28.4																																
Sep	09-Sep-19	7.28	365.9	1.92	598	299	10.5	29.4	-																															
Sep	10-Sep-19	7.33	325.2	1.7	1118	559	3.5	29.76	-																															
Sep	11-Sep-19	7.46	155.2	1.43	955	478	-	29.4	45	38	24.32	-	7.2	0.918	< 3.1	4.63	2	≤0.002	0.046	≤0.01	≤0.002	≤0.002	≤0.01	≤0.002	≤0.002	0.012	0.008	≤0.002	0.904	< 0.002	0.005	7.73	< 0.05	0.679	< 0.1	0.059	0.078	0.012	-
Sep	12-Sep-19	7.24	237.3	1.56	596	298	-	29.65	-																															
Sep	13-Sep-19	7.11	392.7	1.09	541	270	10	29.1	-																														7	
Sep	14-Sep-19	7.04	293.3	0.9	533	361	7.4	29.81																																
Sep	15-Sep-19	7.1	289.4	0.95	643	357	7.2	30.08																																
Sep	16-Sep-19	7.05	273.4	0.9	632	354	7.4	30.51	-																															
Sep	17-Sep-19	7.32	356.2	1.18	715	358	8.4	30.13	-																															
Sep	18-Sep-19								146																															
Sep	19-Sep-19	7.53	248.4	1.2	576	288	7.8	30.38	-																															
Sep	20-Sep-19	7.49	373	1.36	715	357	18.9	30.28	-																															
Sep	21-Sep-19	7.32	362.1	1.42	678	268	17.6	30.36																																
Sep	22-Sep-19	7.1	364.2	1.34	669	352	16.4	31.15																																
Sep	23-Sep-19	7.03	278.1	1.27	515	257	43.5	32.77	-																															
Sep	24-Sep-19	7.55	348	1.18	664	332	15.6	30.1	-																															
Sep	25-Sep-19	6.96	111.3	1.95	564	282	14.6	30.36	411																															
Sep	26-Sep-19	7.64	253.6	1.36	653	327	-	30.59	-																															
Sep	27-Sep-19	7.3	203.8	2.83	637	318	6.5	30.81	-																															
Sep	28-Sep-19	7.21	204.6	2.62	798	399	15.2	30.67																																
Sep	29-Sep-19	7.1	213.4	2.54	782	372	12.6	29.64																																
Sep	30-Sep-19	7.15	224.2	1.64	794	374	12.5	28.64	-																															

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED
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Monitoring Parameters Result for STP(Phase-2)

Month	Date	Outlet																																					
		pH	ORP	DO	EC	TDS	Turbidity	Temp	COD	SS	BOD	T-Coli	T-N	T-P	O&G	Color	Odor	Mercury	Zinc	Arsenic	Chromium	Cadmium	Selenium	Lead	Copper	Barium	Nickel	Silver	Iron	Cyanide	Total Cyanide	Ammonia	Hexavalent Chromium (Cr6+)	Fluoride	Total Chlorine	Free Chlorine	Sulphide	Formal-dehyde	Phenols
		Daily Parameters								Weekly Parameters																				Monthly Parameters										
Standard		6 ~ 9	-	-	-	Max 2,000	-	Max 35	Max 125	Max 50	Max 30	Max 400	Max 60	Max 2	Max 10	Max 150	Max 150	Max 0.005	Max 2	Max 0.1	Max 0.5	Max 0.03	Max 0.02	Max 0.1	Max 0.5	Max 1	Max 0.2	Max0.5	Max3.5	Max 0.1	Max 1	Max10	Max0.1	Max20	Max0.2	Max 1	Max 1	Max 1	Max 0.5
Unit		-	mv	mg/L	µs/cm	ppm	FNU	°C	ppm	ppm	ppm	MNP/100ml	ppm	ppm	ppm	-	-	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Apr	01-Apr-19	7.43	152.9	3.96	1186	593	2.47	29.43	-																														
Apr	02-Apr-19	7.14	145.4	3.92	1139	569	35.9	29.53	-																														
Apr	03-Apr-19	7.2	132.6	3.8	1127	672	34.9	28.97	-	Tank Cleaning and Maintenance																														
Apr	04-Apr-19	7.14	138.9	2.95	1190	579	36.2	28.54	-																														
Apr	05-Apr-19	7.49	57.7	3.68	1180	591	9.8	30.05	-																														
Apr	06-Apr-19	7.23	56.2	3.91	1181	591	8.5	29.84																															
Apr	07-Apr-19	7.32	8.9	4.18	1182	591	8.1	29.99																															
Apr	08-Apr-19	7.14	138.5	3.87	1174	572	34.6	28.56	-																														
Apr	09-Apr-19	7.35	-38.2	3.54	1172	586	13.5	30.04	-																														
Apr	10-Apr-19	7.4	18.6	4.55	1166	583	7	30.02	-	Tank Cleaning and Maintenance																														
Apr	11-Apr-19	7.31	15	1.97	1311	655	25.2	29.59	-																														
Apr	12-Apr-19	7.33	17.5	3.5	1331	585	24.2	30.75	-																														
Apr	13-Apr-19	7.56	59.5	4.93	1169	584	6.4	30.19																															
Apr	14-Apr-19	7.55	32.8	4.52	1167	583	10.2	30.31																															
Apr	15-Apr-19	7.49	42.3	4.46	1128	628	15.4	30.12																															
Apr	16-Apr-19	7.62	57.6	3.29	1263	620	8.9	30.23																															
Apr	17-Apr-19	7.38	148	4.74	1159	579	7.2	30.53																															
Apr	18-Apr-19	7.24	190.4	4.34	1168	584	25.2	30.59	-	Tank Cleaning and Maintenance																														
Apr	19-Apr-19	7.37	135	5.01	1171	585	10.9	30.76	-																														
Apr	20-Apr-19	7.38	199.2	4.47	1158	579	10.8	30.65																															
Apr	21-Apr-19	7.37	115.1	5.17	1175	588	6.9	30.9																															
Apr	22-Apr-19	7.43	135.4	5.57	1173	587	7.6	30.97	-																														
Apr	23-Apr-19	7.47	164.3	5	1168	584	9.4	31.11	-																														
Apr	24-Apr-19	7.41	154.3	3.51	1146	573	17.6	30.98	-	Tank Cleaning and Maintenance																														
Apr	25-Apr-19	7.21	69.5	4.22	1219	609	12.7	30.91	-																														
Apr	26-Apr-19	7.1	113.2	5.1	1179	597	11.9	31.27	-																														
Apr	27-Apr-19	7.11	126.1	3.11	1210	605	20.8	31.36																															
Apr	28-Apr-19	7.26	116.4	5.19	1164	578	12.5	30.37																															
Apr	29-Apr-19	7.72	64.8	5.18	1216	608	15.1	30.7	-																														
Apr	30-Apr-19	7.53	113.4	5.62	1216	608	13	30.36	-	Tank Cleaning and Maintenance																														
May	01-May-19	7.41	123.4	2.21	1168	571	2.3	31.32																															
May	02-May-19	7.23	104.3	2.28	1172	586	16.9	31.13	-																														
May	03-May-19	7.09	187.5	2.77	1172	586	10.5	31.1	-																														
May	04-May-19	7.29	59.1	2.55	1150	590	7.3	31.15																															
May	05-May-19	7.39	69.4	2.76	1179	589	7.8	31.11																															
May	06-May-19	7.34	8	2.16	1180	590	7.8	30.84	-																														
May	07-May-19	7.16	82.6	1.64	1171	585	9.4	30.83	-																														
May	08-May-19	7.12	223.3	3.43	1181	591	1.6	31.9	-	Tank Cleaning and Maintenance																														
May	09-May-19	7.26	120.1	2.34	1167	568	6.7	30.63	-																														
May	10-May-19	7.29	58.2	2.56	1190	596	7.3	31.9	-																														
May	11-May-19	7.14	83.6	1.54	1182	578	7.5	31.14																															
May	12-May-19	7.15	108.1	2.72	1163	581	7.2	30.33																															
May	13-May-19	7.24	95.4	1.68	1183	572	7.4	32.09	-																														
May	14-May-19	7.29	58.1	2.56	1178	590	7.3	31.2	-																														
May	15-May-19	7.26	237.9	2.29	1208	604	15.7	30.22	-	Tank Cleaning and Maintenance																														
May	16-May-19	7.71	-90.2	2.88	1271	636	65	32.07	-																														
May	17-May-19	7.51	84.2	1.83	1240	620	1.4	31.69	-																														
May	18-May-19	7.34	338.1	2.3	1329	664	2.8	31.6																															
May	19-May-19	6.77	298.1	2.73	1304	667	0.1	31.6																															
May	20-May-19	7.13	329.2	4.02	1431	716	0.3	31.81	-																														
May	21-May-19	7.24	223.2	3.97	1384	651	2.4	31.46	20																														
May	22-May-19	7.2	257.8	2.69	1173	586	0.6	31.52	-	Tank Cleaning and Maintenance																														
May	23-May-19	7.02	213.3	3.03	1148	574	0.5	31.76	-																														
May	24-May-19	7.35	149.7	3.31	1202	601	13.7	31.71	-																														
May	25-May-19	7.27	137.2	3.28	1148	630	2.5	31.42																															
May	26-May-19	7.26	164.7	2.9	1309	655	0.1	31.25																															
May	27-May-19	7.38	205.7	2.83	1297	648	1.1	31.45	-																														
May	28-May-19	7.42	196.2	2.34	1284	545	1.4	28.9	-																														
May	29-May-19	7.33	30.4	2.76	1157	578	21.2	31.28	27.6	10	3.15	<1.8	14.9	1.11	<3.1																								
May	30-May-19	7.15	148.8	2.45	1155	577	1.1	31.01	32.6																														
May	31-May-19	7.27	170.8	2.25	1111	556	2.6	31.09	29.7																														
Jun	01-Jun-19	7.38	261.7	2.39	1076	537	8	31.16																															
Jun	02-Jun-19	7.27	248.6	1.86	1135	441	3.5	30.29																															
Jun	03-Jun-19	7.43	122.3	1.66	1020	510	0.9	30.49	16.9																														
Jun	04-Jun-19	7.15	273.7	1.59	979	489	0.4	30.76	18.4																														
Jun	05-Jun-19	7.36	213.2	1.64	1077	539	11.7	31.37	22.4	2	1.03	< 1.8	9.6	0.6	< 3.1	4.22	1	≤0.002	≤0.002	≤0.01	≤0.002	≤0.002	≤0.01	≤0.002	≤0.002	0.012	0.008	≤0.002	0.028	< 0.002	0.013	8.58	< 0.05	1.939	0.2	0.1	< 0.005	0.047	0.005
Jun	06-Jun-19	7.28	158.4	2.32	1152	521	10.5	30.56	21																														
Jun	07-Jun-19	7.24	243.6	1.35	1018	509	0.7	30.66	17.3																														
Jun	08-Jun-19	7.21	172.4	1.2	1050	525	3.6	31.07																															
Jun	09-Jun-19	7.24	244	1.05	1054	527	0.1	31.04																															
Jun	10-Jun-19	7.37	236.7	2.33	1087	469	2.2	31.14	17.8																														
Jun	11-Jun-19	7.22	234	1.36	1066	562	2.4	31.16	16.5																														
Jun	12-Jun-19	7.24	244	1.45	1041	541	2.1	31.14	23.1	2	2.33	< 1.8	9.6	0.439	< 3.1																					0.1				
Jun	13-Jun-19	7.28	415.9	1.22	744	372	27.1	30.62	22.6																														
Jun	14-Jun-19	7.28	377.9	1.67	742	371	0.2	30.41	20.4																														
Jun	15-Jun-19	7.21	326.6	1.91	839	420	11.7	30.55																															
Jun	16-Jun-19	7.22	373.5	1.61	874	437	0.5	30.62																															
Jun	17-Jun-19	7.16	398.5	1.94	800	400	1.1	30.82	19.7																														
Jun	18-Jun-19	7.16	440.5	1.64	840	420	1.7	30.45	24.3																														
Jun	19-Jun-19	7.55	399.2	1.73	656	328	58.9	30.26	18.2	2	2.09	< 1.8	10.2	0.52	< 3.1																					0.3				
Jun	20-Jun-19	7.36	407.1	1.71	789	395	0.3	29.69	15.1																														
Jun	21-Jun-19	7.23	392.5	1.98	769	384	4.6	29.86	15.6																														
Jun	22-Jun-19	7.17	227.4	2.23	642	367	5.4	30.48																															
Jun	23-Jun-19	7.45	406	1.77	849	425	0	30.88																															
Jun	24-Jun-19	6.96	418.7	1.83	839	420	0	31.35	16.6																														
Jun	25-Jun-19	7.32	460.3	1.36	843	422	0.2	31.25	14.7																														
Jun	26-Jun-19	7.6	394.3	1.99	805	402	2	31.24	12.7	2	2.89	< 1.8	7.9	0.411	< 3.1																					0.1				
Jun	27-Jun-19	6.9	177	2.07	795	398	0.2	30.77	15.4																														
Jun	28-Jun-19	7.26	157.4	2.33	835	379	0.2	29.69	16.5																														
Jun	29-Jun-19	7.43	427.1	1.66	999	450	3.2	30.4																															
Jun	30-Jun-19	7.23	324.5	1.36	843	382	2.5	30.05																															
Jul	01-Jul-19	7.14	496.3	1.65	820	410	0.13	30.05	18.3																														
Jul	02-Jul-19	7.17	518.5	1.41	648	324	5.4	29.86	19.6																														
Jul	03-Jul-19	7.33	490.2	1.36	800	480	6.1	30.14	17.1	2	0.17	< 1.8	10.8	0.292	< 3.1	3.47	1	≤0.002	0.036	≤0.01	0.002	≤0.002	≤0.01	≤0.002	≤0.002	0.01	0.008	≤0.002	0.07	< 0.002	0.004	5.08	< 0.05	0.607	0.2	0.1	< 0.005	0.021	0.004
Jul	04-Jul-19	6.84	351.8	2.42	678	332	4.9	30.33	15.8																														
Jul	05-Jul-19	7.42	513	1.45	685	342	0	29.55	12.8																														
Jul	06-Jul-19	7.03	476.8	1.7	708	354	0.3	29.66																															
Jul	07-Jul-19	7.28	495.3	1.64	748	374	12	30.09																															
Jul	08-Jul-19	7.05	498.4	1.41	658	341	10.7	31.05	16.1																														
Jul	09-Jul-19	7.35	494.2	1.18	730	365	0.3	29.93	9.9																														
Jul	10-Jul-19	7.07	507.4	1.13	622	311	0.6	29.82	13.6	2	6.79	< 1.8	6.1	0.222	< 3.1																					0.3				
Jul	11-Jul-19	7.35	486.3	1.21	569	284	0.3	29.78	13.6																														
Jul	12-Jul-19	7.4	490.4	1.4	542	375	11.4	29.04	14.6																														
Jul	13-Jul-19	7.48	519.7	1.29	626	313	1.3	29.91																															
Jul	14-Jul-19	7.36	480.9	1.3	538	325	1.5	29.05																															
Jul	15-Jul-19	7.4	460.3	1.15	631	316	8	29.58	9.1	6	1.14	< 1.8	4.3	0.31	< 3.1																					0.4				
Jul	16-Jul-19	7.28	374.2	2.13	473	260	6.4	30.24																															
Jul	17-Jul-19	7.33	481.4	1.08	636	318	0.2	29.5	11.1																														
Jul	18-Jul-19	7.29	473.1	1.11	625	313	2.6	29.78	10.2																														
Jul	19-Jul-19	7.47	466.8	1.25	769	385	2.8	30.31																															
Jul	20-Jul-19	7.35	465.5	1.23	689	357	2.7	30.1																															
Jul	21-Jul-19	7.32	530.4	0.95	770	385	8.5	30.5																															
Jul	22-Jul-19	7.3	507.4	0.99	783	392	7.9	30.49	9.8																														
Jul	23-Jul-19	7.35	505.2	1.08	860	430	1	30.37	11.6																														
Jul	24-Jul-19	6.99	386.4	1.22	620	384	13.4	30.35	20.6	14	3.52	23	7.9	0.568	< 3.1																					0.2				
Jul	25-Jul-19	6.95	560	1.13	833	416	2.7	30.11	13.1																														
Jul	26-Jul-19	7.24	510.8	1.06	790	395	2.7	29.72	17.1																														
Jul	27-Jul-19	7.36	510.9	1.49	664	332	13.7	29.57																															
Jul	28-Jul-19	7.19	450.5	2.35	523	329	14.7	29.43																															
Jul	29-Jul-19	7.3	548.1	1.22	944	472	1.9	29.35	7.9																														
Jul	30-Jul-19	7.03	518.8	1.19	819	410	31.7	29.38	10.4																														
Jul	31-Jul-19	7.33	505.2	1.42	781	391	2.6	29.61	9.7	2	1.97	7.8	9.2	0.339	< 3.1																					0.1				
Aug	01-Aug-19	7.21	501.9	1.22	731	379	3.4	29.26	15.1																														
Aug	02-Aug-19	7.63	498.9	1.12	1142	571	6.6	29.37	13.6																														
Aug	03-Aug-19	7.15	515.8	1.98	1084	542	11.6	29.45																															
Aug	04-Aug-19	6.83	569.4	1.16	916	459	1.7	29.3																															
Aug	05-Aug-19	6.72	518.3	1.12	897	415	1.9	29.28	11.1																														

Monitoring Parameters Result for STP(Phase-2)

Month	Date	Outlet																																								
		pH	ORP	DO	EC	TDS	Turbidity	Temp	COD	SS	BOD	T-Coli	T-N	T-P	O&G	Color	Odor	Mercury	Zinc	Arsenic	Chromium	Cadmium	Selenium	Lead	Copper	Barium	Nickel	Silver	Iron	Cyanide	Total Cyanide	Ammonia	Hexavalent Chromium (Cr6+)	Fluoride	Total Chlorine	Free Chlorine	Sulphide	Formal-dehyde	Phenols
		Daily Parameters								Weekly Parameters																				Monthly Parameters											
Standard		6 ~ 9	-	-	-	Max 2,000	-	Max 35	Max 125	Max 60	Max 30	Max 400	Max 60	Max 2	Max 10	Max 150	Max 150	Max 0.005	Max 2	Max 0.1	Max 0.5	Max 0.03	Max 0.02	Max 0.1	Max 0.5	Max 1	Max 0.2	Max0.5	Max3.5	Max 0.1	Max 1	Max10	Max0.1	Max20	Max0.2	Max 1	Max 1	Max 1	Max 0.5
Unit		-	mv	mg/L	µs/cm	ppm	FNU	°C	ppm	ppm	ppm	MNP/100ml	ppm	ppm	ppm	-	-	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Aug	06-Aug-19	7.41	562	1.33	722	261	10.6	28.76	14.7																																	
Aug	07-Aug-19	7.37	469.9	1.45	594	297	21.9	28.71	24.6	16	8.03	92000	7.3	0.758	< 3.1	2.58	1	≤0.002	0.014	≤0.01	0.002	≤0.002	≤0.01	≤0.002	0.002	0.012	0.012	≤0.002	1.106	< 0.002	0.025	0.329	< 0.05	0.373	0.1	0.1	0.015	0.054	0.003
Aug	08-Aug-19	8.09	407.5	1.1	615	308	18	28.76	16.3																																	
Aug	09-Aug-19	7.86	390.4	1.12	583	287	16.8	28.98	17.1																																	
Aug	10-Aug-19	6.89	502	2.4	580	290	1.2	28.81																																		
Aug	11-Aug-19	7.28	513.1	1.49	664	332	14	28.9																																		
Aug	12-Aug-19	7.07	518.2	1.63	637	318	9.1	28.49																																		
Aug	13-Aug-19								11.4																																		
Aug	14-Aug-19	7.04	535.6	2.32	618	309	7.1	28.55	17.2	2	4.79	13	6	0.542	< 3.1																					0.1					
Aug	15-Aug-19	7.77	458.9	2.35	732	370	6.5	28.78	15.3																																	
Aug	16-Aug-19	7.39	486.9	2.05	719	359	8	29.11	13.1																																	
Aug	17-Aug-19	7.29	460.7	2	703	330	6.4	29.28																																		
Aug	18-Aug-19	7.49	485.6	2.74	740	370	2.5	29.53																																		
Aug	19-Aug-19	7.43	169.5	2.24	750	375	2	29.12	18.7																																	
Aug	20-Aug-19	7.74	469.1	2.16	776	338	0	29.35	17.9																																	
Aug	21-Aug-19	7.23	420.3	1.18	690	375	1.2	29.28	19.1	2	2.02	130	10.1	0.412	< 3.1																											
Aug	22-Aug-19	7.55	496.8	2.12	729	364	7.4	29.27	18.7																																	
Aug	23-Aug-19	7.39	510.5	2.11	674	337	1	29.22	17.1																																	
Aug	24-Aug-19	7.38	486.5	1.84	714	357	2.6	29.33																																		
Aug	25-Aug-19	7.35	473.9	1.75	715	362	2.7	31.39																																		
Aug	26-Aug-19	7.56	200.7	3.85	929	464	1.5	29.06	15.2																																	
Aug	27-Aug-19	7.14	417.7	2.19	874	437	1.4	29.01	16.8																																	
Aug	28-Aug-19	6.87	288.5	3.4	905	453	1.6	28.98	11.4	2	2.28	< 1.8	8.3	2.59	< 3.1																											
Aug	29-Aug-19	6.98	276.1	2.82	885	425	1.2	29.98	12.8																																	
Aug	30-Aug-19	7.64	449	1.91	866	443	1.5	29.39	11.3																																	
Aug	31-Aug-19	7.21	459	2.01	894	451	1.6	29.39																																		
Sep	01-Sep-19	7.26	469.8	2.01	822	442	1.7	29.16																																		
Sep	02-Sep-19	7.23	472.4	2.1	824	442	1.8	30.02	19.1																																	
Sep	03-Sep-19	7.34	370.8	1.65	493	247	26.3	29.19	22.4																																	
Sep	04-Sep-19	7.53	367	3.28	702	351	2.3	29.06	10.7	2	5.71	< 1.8	9.2	0.382	< 3.1																											
Sep	05-Sep-19	7.51	402	1.99	702	351	1.4	29.07	11.7																																	
Sep	06-Sep-19	7.34	421	1.75	748	374	2.7	29.02	19.8																																	
Sep	07-Sep-19	7.33	434.6	2.1	708	306	3.9	28.93																																		
Sep	08-Sep-19	7.32	434.7	2.15	788	389	3.4	29.43																																		
Sep	09-Sep-19	7.38	334	2.35	634	317	8.1	29.14	18.6																																	
Sep	10-Sep-19	7.51	357.8	1.93	622	311	1.8	29.06	8.2																																	
Sep	11-Sep-19	7.46	208.4	1.67	640	320	-	28.79	11.2	4	8.88	< 1.8	6.5	0.313	< 3.1	1.65	1	≤0.002	0.018	≤0.01	≤0.002	≤0.002	≤0.01	≤0.002	≤0.002	0.002	0.004	≤0.002	0.068	< 0.002	0.007	0.104	< 0.05	0.914	0.1	0.1	< 0.005	0.02	< 0.002
Sep	12-Sep-19	7.1	338.3	1.38	620	310	-	28.58	14.8																																	
Sep	13-Sep-19	7.25	398.1	1.28	616	308	1.6	28.75	17.7																																	
Sep	14-Sep-19	7.1	235.8	0.92	640	320	9.3	29.79																																		
Sep	15-Sep-19	7.18	415.1	0.83	610	283	4.3	30.1																																		
Sep	16-Sep-19	6.16	432.6	1.53	629	272	5.4	30.05	29.6																																	
Sep	17-Sep-19	7.27	421.5	1.35	862	944	431	29.99	29.6																																	
Sep	18-Sep-19								16.7	2	6.02	33	8.3	0.367	< 3.1																												
Sep	19-Sep-19	7.67	360.1	1.33	920	460	2.7	30.12	21.1																																	
Sep	20-Sep-19	7.55	307.1	1.58	867	434	8.1	30.35	22.1																																	
Sep	21-Sep-19	7.4	386.6	1.56	841	420	6.2	30.32																																		
Sep	22-Sep-19	7.31	375.4	1.45	832	430	7.4	31.24																																		
Sep	23-Sep-19	7.06	382.2	1.39	752	376	2.4	30.21	26.1																																	
Sep	24-Sep-19	7.67	320.3	1.32	736	368	0.3	30.41	18.3																																	
Sep	25-Sep-19	7.28	154.1	2.4	754	377	0.2	30.35	15.5	2	28.96	< 1.8	8.3	0.367	< 3.1																											
Sep	26-Sep-19	7.4	316.4	1.5	767	383	-	30.38	12.2																																	
Sep	27-Sep-19	7.37	337.3	1.66	765	382	1.9	30.19	21.4																																	
Sep	28-Sep-19	7.66	300.8	1.52	803	401	0	30.44																																		
Sep	29-Sep-19	7.13	292.6	1.43	824	792	0	29.43																																		
Sep	30-Sep-19	7.1	283.7	2.13	832	783	1.5	30.42	15.2																																	

MYANMAR JAPAN THILAWA DEVELOPMENT LTD. MJTD

Monitoring Parameters Result for STP(Phase-2)

Inlet

Month	Date	pH	ORP	DO	EC	TDS	Turbidity	Temp	COD	BOD	T-Coli	T-N	T-P	O&G	SS
		Daily Parameters								Weekly Parameters					
Standard		6 ~ 9	-	-	-	Max 2,000	-	Max 35 °C	Max 400	Max 200	-	Max 60	Max8	Max 40	Max 200
Unit		-	mv	mg/L	µs/cm	ppm	FNU	°C	ppm	ppm	MPN/100ml	ppm	ppm	ppm	ppm
Apr	01-Apr-19	7.31	27.7	2.18	1180	593	22.6	29.11	-						
Apr	02-Apr-19	7.17	98.2	2.28	1262	631	98.3	29.69	-						
Apr	03-Apr-19	7.1	97.1	3.21	1371	710	86.7	28.79	-	Tank Cleaning and Maintenance					
Apr	04-Apr-19	7.19	88.3	2.19	1272	651	84.9	29.65	-						
Apr	05-Apr-19	7.64	32.9	3.11	1037	518	47.4	30.23	-						
Apr	06-Apr-19	7.36	18.4	3.3	1274	637	32.7	29.84							
Apr	07-Apr-19	7.26	16.9	2.83	1273	636	25	30.14							
Apr	08-Apr-19	7.18	34.6	2.87	1373	631	26.6	29.86	-						
Apr	09-Apr-19	7.3	-79.9	0.22	1282	641	18.1	29.74	-						
Apr	10-Apr-19	7.44	6.7	3.63	1301	650	17.6	29.41	-	Tank Cleaning and Maintenance					
Apr	11-Apr-19	7.31	15	1.97	1311	655	25.2	29.59	-						
Apr	12-Apr-19	7.35	16.1	3.6	1270	659	24.2	30.15	-						
Apr	13-Apr-19	7.43	58.9	5.11	1130	565	29.2	30.12							
Apr	14-Apr-19	7.48	40.1	3.43	1201	601	19.5	30							
Apr	15-Apr-19	7.56	48.5	3.55	128	569	18.4	29.18							
Apr	16-Apr-19	7.25	32.7	3.24	1137	578	18.5	29.15							
Apr	17-Apr-19	7.17	178.6	4.02	1561	781	4.7	30.35							
Apr	18-Apr-19	7.25	164.5	0.56	1086	543	5.9	29.97	-	Tank Cleaning and Maintenance					
Apr	19-Apr-19	7.12	150.7	3.98	1507	754	10.1	30.33	-						
Apr	20-Apr-19	7.25	155.6	3.24	1137	781	18.7	29.3							
Apr	21-Apr-19	7.28	150.7	3.98	1187	743	17.7	30.33							
Apr	22-Apr-19	7.2	147.8	4.7	1321	660	2.9	30.36	-						
Apr	23-Apr-19	7.45	74.9	1.86	1407	703	10.1	30.55	-						
Apr	24-Apr-19	7.45	47.9	2.96	1378	646	24	30.45	-	Tank Cleaning and Maintenance					
Apr	25-Apr-19	7.03	51.2	2.81	1361	680	11.8	30.51	-						
Apr	26-Apr-19	7.33	107	3.4	1320	660	10.8	30.31	-						
Apr	27-Apr-19	7.82	187.9	3.67	1291	710	11.4	30.85							
Apr	28-Apr-19	7.68	160.4	2.98	1356	672	10.8	30.48							
Apr	29-Apr-19	7.65	43.9	3.24	1332	666	14.6	30.48	-						
Apr	30-Apr-19	7.63	18.1	4.23	1272	636	17	30.56	-	Tank Cleaning and Maintenance					
May	01-May-19	7.29	152.4	2.21	1248	679	12.4	32.4							
May	02-May-19	7.41	104.2	2.46	1380	690	13.7	30.55	-						
May	03-May-19	7.2	146	1.87	1052	620	14.7	30.66	-						
May	04-May-19	7.28	45.1	2.13	1247	624	21	30.56							
May	05-May-19	7.2	95.3	1.95	1284	594	18	31.68							
May	06-May-19	7.37	14.2	1.92	1260	630	11.6	30.47	-						
May	07-May-19	7.22	68.7	1.32	1285	642	12.3	30.54	-						
May	08-May-19	7.4	-54.5	2.68	1342	671	46.2	30.24	-	Tank Cleaning and Maintenance					
May	09-May-19	7.62	46.8	2.16	1234	572	12.4	30.32	-						
May	10-May-19	7.49	43.1	1.82	1240	690	21	30.46	-						
May	11-May-19	7.24	67.6	1.42	1274	637	11.4	30.84							
May	12-May-19	7.06	88.5	2.25	1154	577	17.5	30.75							
May	13-May-19	7.07	86.4	1.76	1284	587	19.5	31.65	-						
May	14-May-19	7.04	56.6	2.69	1392	698	12.4	30.31	-						
May	15-May-19	7.16	222.4	1.59	861	431	27.9	31.48	-	Tank Cleaning and Maintenance					
May	16-May-19	8.01	-40	2.48	1215	608	9.7	30.43	-						
May	17-May-19	7.38	86.1	1.16	1491	747	43.1	31.89	-						
May	18-May-19	7.29	309.4	1.44	1246	623	31.6	32.37							
May	19-May-19	7.07	274.1	2.35	1729	865	7.2	32.04							
May	20-May-19	6.98	310.5	3.82	630	315	20.2	31.45	-						
May	21-May-19	7.22	25.8	3.51	742	433	20.8	31.46	152						
May	22-May-19	7.37	256.8	2.21	1493	747	18.9	31.72	-	Tank Cleaning and Maintenance					
May	23-May-19	7.23	148.9	2.47	917	459	17.3	31.65	-						
May	24-May-19	7.11	156.9	2.57	1374	687	11.4	31.97	-						
May	25-May-19	7.1	156.6	2.71	1496	749	11.7	31.97							
May	26-May-19	7.16	173.4	2.56	1299	650	22.8	31.53							
May	27-May-19	7.19	180.4	2.2	968	484	17	31.44	-						
May	28-May-19	7.18	152.4	3.03	1146	573	10.7	31.47	-						
May	29-May-19	7.29	22.2	2.49	1049	524	51.2	31.5	119	23.37	>160000	11.5	1.6	<3.1	52
May	30-May-19	7.06	126.4	1.88	993	497	16.6	31.1	330						
May	31-May-19	7.11	163	1.93	910	455	19	31.63	35						
Jun	01-Jun-19	7.06	288.5	2.27	1099	550	12.4	31.48							
Jun	02-Jun-19	7.22	185.4	2.46	1136	472	10.8	31.25							
Jun	03-Jun-19	7.41	85.6	1.22	1027	514	16	30.72	34						
Jun	04-Jun-19	7.14	208.1	1.33	843	422	38.6	31.42	147						
Jun	05-Jun-19	7.18	229.2	1.44	1097	549	10.3	31.56	289	70.91	> 160000	14.2	1.52	3.85	110
Jun	06-Jun-19	7.17	102	0.86	1047	524	13.4	31.47	13400						
Jun	07-Jun-19	7.14	221.9	1.16	876	438	29.7	30.81	61						
Jun	08-Jun-19	7	157.4	1.45	641	320	13.7	31.19							
Jun	09-Jun-19	7.07	208.1	2.35	1247	623	8.8	31.36							
Jun	10-Jun-19	7.24	160.4	2.27	1082	563	12.2	31.47	52						
Jun	11-Jun-19	6.98	442	2.25	909	455	1.9	30.49	77						
Jun	12-Jun-19	7.07	206.1	2.31	1101	539	1.9	30.51	44	15.29	> 160000	16.4	1.5	< 3.1	30
Jun	13-Jun-19	7.12	431.8	1.07	568	284	19.2	31.23	398						
Jun	14-Jun-19	7.26	341.3	2.24	483	346	13.8	30.47	21						
Jun	15-Jun-19	6.98	296.6	1.7	635	317	16.7	31.04							
Jun	16-Jun-19	7.08	365.5	1.3	541	271	18	31.23							
Jun	17-Jun-19	7	418	1.85	866	433	35.4	30.94	214						
Jun	18-Jun-19	6.85	347.2	2.36	749	382	27.9	30.48	45						
Jun	19-Jun-19	7.1	378.2	2.26	586	456	28.7	30.52	38	34.26	> 160000	12.6	0.537	< 3.1	64
Jun	20-Jun-19	7.36	401.4	1.55	488	244	48.6	30.15	30						
Jun	21-Jun-19	7.26	396.4	1.78	1280	640	22.4	31.16	80						
Jun	22-Jun-19	7.16	340.7	2.26	870	478	24.5	30.46							
Jun	23-Jun-19	7.22	401.3	1.31	988	494	24.8	30.49							
Jun	24-Jun-19	6.83	366	1.36	738	410	20.4	30.51	115						
Jun	25-Jun-19	7.24	458.7	1.24	771	380	19.9	30.81	106						
Jun	26-Jun-19	7.66	363	1.76	1116	558	15.6	31	36	8.44	> 160000	11.8	0.915	< 3.1	18
Jun	27-Jun-19	6.88	494.4	2	635	317	34.6	30.94	34						
Jun	28-Jun-19	7.24	170.5	2.23	1089	542	13.1	30.84	29						
Jun	29-Jun-19	7.34	437.2	1.3	974	487	59.3	30.86							
Jun	30-Jun-19	7.64	458.8	2.05	852	350	24.5	30.51							
Jul	01-Jul-19	7.26	517.7	1.48	458	229	71	29.97	23						
Jul	02-Jul-19	7.28	483.5	1.13	765	383	29.5	30.7	46						
Jul	03-Jul-19	7.22	499.8	1.19	609	305	30.5	30.45	40	29.45	> 160000	9.9	1.67	< 3.1	30
Jul	04-Jul-19	7.37	420.5	2.21	557	230	27.4	30.64	50						
Jul	05-Jul-19	7.26	468.6	2.19	652	362	26.4	30.56	27.6						
Jul	06-Jul-19	6.9	477.3	1.59	927	463	15.3	30.56							
Jul	07-Jul-19	7.13	510.3	1.63	741	370	20.9	30.31							
Jul	08-Jul-19	7.35	491.8	1.42	692	243	19.6	30.29	28.8						
Jul	09-Jul-19	7.36	435.6	1.18	698	340	30.6	30.39	47						
Jul	10-Jul-19	6.94	519.7	1.03	565	282	12.2	30.37	76	16.9	> 160000	15.9	1.29	< 3.1	20
Jul	11-Jul-19	7.18	504.3	1.08	373	185	23.8	30.03	35.1						
Jul	12-Jul-19	7.16	445.7	1.04	537	292	20.4	29.5	84						
Jul	13-Jul-19	7.36	426.3	2.21	564	236	30.6	30.56							
Jul	14-Jul-19	7.18	529.3	2.19	593	238	30.9	29.06							
Jul	15-Jul-19	7.2	478.6	1.04	606	302	30	29.86	15.1	3.65	> 160000	6.1	0.502	< 3.1	40
Jul	16-Jul-19	6.75	364.1	2.2	472	245	24.7	30.48							
Jul	17-Jul-19	7.24	438.6	2.16	648	326	26.5	30.64	17.1						
Jul	18-Jul-19	6.87	522.3	1.02	505	252	12.5	30.04	34.7						
Jul	19-Jul-19	7.3	494.1	1.08	554	277	12.1	30.16							
Jul	20-Jul-19	7.25	475.3	1.06	545	265	11.4	31.05							
Jul	21-Jul-19	7.17	506	0.78	938	469	34.4	30.46							
Jul	22-Jul-19	7.18	487.2	0.82	884	442	7.9	30.36	37.6						
Jul	23-Jul-19	7.23	524.5	0.99	605	303	15.2	30.37	42						
Jul	24-Jul-19	7.28	435.3	2.13	551	357	16.5	30.42	37	11.76	>160000	6.9	0.798	< 3.1	12
Jul	25-Jul-19	7.07	13.4	0.92	658	329	17	30.31	83						
Jul	26-Jul-19	7.13	515.5	0.83	686	343	34.7	30.1	27.1						
Jul	27-Jul-19	7.2	523.7	1.27	528	264	38.1	29.63							
Jul	28-Jul-19	7.24	424.1	2.26	514	321	24.8	30.15							
Jul	29-Jul-19	7.2	524.2	2.36	681	248	25.2	31.22	17.5						
Jul	30-Jul-19	6.84	532.5	1.01	513	256	12.6	29.91	19.7						
Jul	31-Jul-19	7.16	528.5	1.16	713	356	22.8	30.07	24.7	16.87	> 160000	11.5	0.928	< 3.1	20
Aug	01-Aug-19	7.11	513.7	1.12	756	398	12.6	30.18	22.7						
Aug	02-Aug-19	7.58	512.1	1.14	422	211	50.6	29.69	34.8						
Aug	03-Aug-19	7.05	525.1	1.50	455	228	34.3	29.58							
Aug	04-Aug-19	6.96	559	1.11	442	221	11.8	29.76							
Aug	05-Aug-19	6.81	532.6	1.22	416	211	12.4	30.16	33						
Aug	06-Aug-19	6.79	548.2	1.16	198	326	13.2	30.36	48						
Aug	07-Aug-19	7.26	495.7	1.38	425	212	57.3	28.86	26.9	33.55	> 160000	6.2	0.647	< 3.1	44
Aug	08-Aug-19	7.57	428.1	0.98	387	193	27.8	29.26	31.6						
Aug	09-Aug-19	7.12	401.3	1.22	369	201	24.6	29.28	37.2						
Aug	10-Aug-19	6.76	364.1	2.22	482	295	24.7	30.85							
Aug	11-Aug-19	7.16	522.5	1.25	437	219	24.7	24.25							
Aug	12-Aug-19	6.92	529.8	1.16	569	285	28.3	29.88							
Aug	13-Aug-19								670						
Aug	14-Aug-19	7.72	382.2	1.9	686	452	16.2	30.42	26.1	32.22	> 160000	6.1	0.919	< 3.1	28
Aug	15-Aug-19	7.46	457.1	1.89	712	356	22	29.48	38.3						
Aug	16-Aug-19	7.33	500.3	1.05	932	466	21.6	29.39	74						
Aug	17-Aug-19	7.56	480.4	1.16	912	431	19.8	30.29							
Aug	18-Aug-19	7.36	436.6	1.18	678	349	30.6	30.38							

Month	Date	Cyanide	Total Cyanide	Chromium	Arsenic	Mercury	Cadmium	Selenium	Lead	Color	Odor	Zinc	Copper	Barium	Nickel	Sulphide	Free Chlorine	Formal-dehyde	Silver	Iron	Ammonia	Hexavalent Chromium (Cr6+)	Fluoride	Total Chlorine	Phenols
		Monthly Parameters																							
Standard		Max 0.1	Max1	Max 0.5	Max 0.1	Max 0.005	Max 0.03	Max 0.02	Max 0.1	150	150	Max 2	Max 0.5	Max 1	Max 0.2	Max1	Max 1	Max 1	Max0.5	Max3.5	Max60	Max0.1	Max20	Max0.2	Max 0.5
Unit		ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	Co-Pt	Co-Pt	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Jun	05-Jun-19	< 0.002	0.009	0.008	≤0.01	≤0.002	≤0.002	≤0.01	≤0.002	9.26	2	0.028	≤0.002	0.04	0.006	0.159	< 0.1	0.427	0.032	2.238	12.8	< 0.05	0.103	< 0.1	0.012
Jun	12-Jun-19																							0.1	
Jun	19-Jun-19																							0.1	
Jun	26-Jun-19																							0.1	
Jul	03-Jul-19	< 0.002	0.004	0.002	≤0.01	≤0.002	≤0.002	≤0.01	≤0.002	4.86	1	0.12	≤0.002	0.032	0.02	0.043	< 0.1	0.101	0.012	2.422	8.43	< 0.05	0.13	< 0.1	0.007
Jul	10-Jul-19																							0.1	
Jul	15-Jul-19																							0.1	
Jul	24-Jul-19																							0.1	
Jul	31-Jul-19																							0.1	
Aug	07-Aug-19	< 0.002	0.002	0.004	≤0.01	≤0.002	≤0.002	≤0.01	≤0.002	2.48	1	0.014	0.002	0.018	0.02	0.079	< 0.1	0.079	≤0.002	2.402	6.44	< 0.05	0.237	< 0.1	0.002

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED MJTD

Monitoring Parameters Result for STP(Phase-2)

Month	Date	Inlet																																				
		pH	ORP	DO	EC	TDS	Turbidity	Temp	COD	BOD	T-Coli	T-N	T-P	O&G	SS	Cyanide	Total Cyanide	Chromium	Arsenic	Mercury	Cadmium	Selenium	Lead	Color	Odor	Zinc	Copper	Barium	Nickel	Sulphide	Free Chlorine	Formal-dehyde	Silver	Iron	Ammonia	Hexavalent Chromium (Cr6+)	Fluoride	Total Chlorine	Phenols
		Daily Parameters								Weekly Parameters																		Monthly Parameters												
Standard		6 ~ 9	-	-	-	Max 2000	-	Max 35°C	Max 400	Max 200	-	Max 80	Max8	Max 40	Max 200	Max 0.1	Max1	Max 0.5	Max 0.1	Max 0.005	Max 0.03	Max 0.02	Max 0.1	150	150	Max 2	Max 0.5	Max 1	Max 0.2	Max 1	Max 1	Max 1	Max0.5	Max3.5	Max30	Max0.1	Max20	Max0.2	Max 0.5
Unit		-	mv	mg/L	µs/cm	ppm	FNU	°C	ppm	ppm	MPN/100ml	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	Co-Pt	Co-Pt	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Aug	19-Aug-19	7.34	387.3	1.45	598	299	32.6	29.32	234																															
Aug	20-Aug-19	7.65	482.5	1.47	904	452	52.5	29.63	-																															
Aug	21-Aug-19	7.72	460.5	1.12	911	417	38.9	29.72	30.4																															
Aug	22-Aug-19	7.68	517.4	1.25	998	401	40.2	30.66	-																															
Aug	23-Aug-19	7.39	501.4	1.1	1011	506	22.5	29.6	-																															
Aug	24-Aug-19	7.37	477.8	1.47	567	330	22.9	29.73	-																															
Aug	25-Aug-19	7.43	466.9	1.39	656	295	22.8	29.74	-																															
Aug	26-Aug-19	7.35	420.5	2.21	568	246	27.3	30.64	-																															
Aug	27-Aug-19	7.18	412.4	1.05	918	459	20.3	29.32	-																															
Aug	28-Aug-19	6.96	269.3	2.56	883	441	31.5	29.64	-																															
Aug	29-Aug-19	6.72	236.8	2.12	819	470	28.4	29.28	-																															
Aug	30-Aug-19	6.92	468.2	1.59	829	398	15.2	30.64	-																															
Aug	31-Aug-19	7.1	466.2	2.01	515	351	14.2	30.64	-																															
Sep	01-Sep-19	7.12	510.4	2.06	756	264	13.8	29.46	-																															
Sep	02-Sep-19	7.15	515.6	2.05	762	362	13.4	29.46	-																															
Sep	03-Sep-19	7.36	368.6	1.73	555	277	20.8	29.3	-																															
Sep	04-Sep-19	7.42	340.9	1.8	726	363	11.3	29.39	-																															
Sep	05-Sep-19	7.48	408.5	1.88	455	228	15.4	29.44	-																															
Sep	06-Sep-19	7.3	411.9	1.58	828	311	15.5	29.54	-																															
Sep	07-Sep-19	7.28	452.5	1.12	796	225	11.3	30.6	-																															
Sep	08-Sep-19	7.15	479.8	1.15	792	394	23.4	30.66	-																															
Sep	09-Sep-19	7.33	342.7	2.11	680	340	18.2	29.37	-																															
Sep	10-Sep-19	7.41	344.5	1.59	707	351	11.7	29.47	-																															
Sep	11-Sep-19	7.41	182.2	1.24	800	400	-	29.56	-																															
Sep	12-Sep-19	7.12	285.6	1.39	592	296	-	29.45	-																															
Sep	13-Sep-19	7.38	350.2	1.1	514	257	17.4	28.77	-																															
Sep	14-Sep-19	7.22	398.7	1.54	611	305	10.7	29.14	-																															
Sep	15-Sep-19	7.05	292.6	1.1	632	346	7.4	29.89	-																															
Sep	16-Sep-19	7.1	254.7	10.4	624	324	7.2	29.9	-																															
Sep	17-Sep-19	7.3	386.3	1.1	846	423	6.4	29.95	-																															
Sep	18-Sep-19																																							
Sep	19-Sep-19	7.87	242.5	0.99	955	477	15.7	30.2	-																															
Sep	20-Sep-19	7.55	273.6	1.37	656	328	24.9	30.19	-																															
Sep	21-Sep-19	7.42	426.3	2.21	564	236	30.8	30.56	-																															
Sep	22-Sep-19	7.34	432.4	2.21	638	242	31.4	29.05	-																															
Sep	23-Sep-19	7.06	253.5	1.26	23	12	66.7	31.61	-																															
Sep	24-Sep-19	7.52	327.9	1.17	649	320	14.5	30.13	-																															
Sep	25-Sep-19	7.11	103.8	1.71	801	401	10.3	29.95	-																															
Sep	26-Sep-19	7.55	211.7	1.36	566	283	-	30.56	-																															
Sep	27-Sep-19	7.29	228.4	1.09	671	335	14.6	30.18	-																															
Sep	28-Sep-19	7.3	238.2	2.09	678	284	15.4	30.21	-																															
Sep	29-Sep-19	7.24	234.8	2.07	664	203	14.3	31.12	-																															
Sep	30-Sep-19	7.16	222.4	2.15	652	242	13.2	32.1	-																															

MYANMAR JAPAN THILAWA DEVELOPMENT LTD
MJTD

Thilawa Special Economic Zone- B

(Phase-1 Operation Phase)

Appendix

General Waste Disposal Record

(April 2019 to September 2019)

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED MJTD

Manifest | C-Slip

*Transportation company to Waste Generator

Date of issuance	(Day Month, Year) 27 - Sep - 2019	Issuer	(Name&Sign)
Number of issuance	9999 - 1909 - ~~0278~~ 0281		

Contractors	Waste generator	Transportation company	Waste service company
Company Name	Myanmar Japan Thilawa Development Ltd	GEM	GEM
Tel			

	Kind	Name	Style of packing
Waste	☑Non-Hazardous	General waste	
	☐Hazardous	Quantity(Unit)	Remark
	☐Others	840 kg	B001

Customer code	0001	Waste Profile code	A001

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign) 3K-8896 Kyaw Naing Oo	(Day Month, Year)
Waste service company	(Name&Sign) Phyu Phyu Aye	(Day Month, Year)

Designed by GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD. GEM-SL-R 010E /00

Manifest

C-Slip

*Transportation company to Waste Generator

Date of issuance	(Day Month, Year) 27 - Sep - 2019	Issuer	(Name&Sign)
Number of issuance	9999 - 1909 - ~~0279~~ 28 0282		

Contractors	Waste generator	Transportation company	Waste service company
Company Name	Myanmar Japan Thilawa Development ltd	GEM	GEM
Tel			

	Kind	Name	Style of packing
Waste	☑Non-Hazardous	General waste	
	☐Hazardous	Quantity(Unit)	Remark
	☐Others	1,400 kg	B001

Customer code	0001	Waste Profile code	A001

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign) Sep 27 May 20 3K/ES96	(Day Month, Year)
Waste service company	(Name&Sign) Phyu Phyu Aye	(Day Month, Year)

Designed by GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD. GEM-SL-R 010E /00

General June - Sep

MJTD MYANMAR JAPAN THILAWA DEVELOPMENT

Manifest — C-Slip

*Transportation company to Waste Generator

Date of issuance	(Day Month, Year) 24 - Aug - 2019	Issuer	(Name&Sign)
Number of issuance	9999 - 1908 - 0207		

Contractors	Waste generator	Transportation company	Waste service company
Company Name	MJTD Myanmar Japan Thilawa Development Ltd	GEM	GEM
Tel			

	Kind	Name	Style of packing
Waste	☐Non-Hazardous	General Waste	
	☐Hazardous	Quantity(Unit)	Remark
	☐Others	1600 kg	GC1

Customer code	C001	Waste Profile code	A(C1

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign) Myi Myi Htwe-3k.8896	(Day Month, Year)
Waste service company	(Name&Sign) Khaw Khaw Aye	(Day Month, Year)

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MJTD MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED

Manifest

C-Slip

*Transportation company to Waste Generator

Date of issuance	(Day Month, Year) 24 - Aug - 2019	Issuer	(Name&Sign)
Number of issuance	9999 - 1908 - 0208		

Contractors	Waste generator	Transportation company	Waste service company
Company Name	Myanmar Japan Thilawa Development Ltd	GEM	
Tel			

	Kind	Name	Style of packing
Waste	☑Non-Hazardous	General Waste	
	☐Hazardous	Quantity(Unit)	Remark
	☐Others	1,280 kg	PCC1

Customer code	CCC1	Waste Profile code	AX01

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign) Htay Oo 3M/8896	(Day Month, Year)
Waste service company	(Name&Sign) Phyu Phyu Aye	(Day Month, Year)

Designed by GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD. GEM-SL-R 010E -00

MJTD MYANMAR JAPAN THILAWA DEVELOPMENT

Manifest C-Slip

*Transportation company to Waste Generator

Date of issuance	(Day Month, Year) 10 - July - 2019	Issuer	(Name&Sign)
Number of issuance	9999 - 1907 - 0116		

Contractors	Waste generator	Transportation company	Waste service company
Company Name	Myanmar Japan Thilawa Development Ltd		
Tel			

	Kind	Name	Style of packing
Waste	☑Non-Hazardous	General waste	
	☐Hazardous	Quantity(Unit)	Remark
	☐Others	1,540 kg	

Customer code	0001	Waste Profile code	

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign) 3K/8896	(Day Month, Year)
Waste service company	(Name&Sign)	(Day Month, Year)

Designed by GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD.

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED MJTD

Manifest C-Slip

*Transportation company to Waste Generator

Date of issuance	(Day Month, Year) 10 - 1.14 - 2019	Issuer	(Name&Sign)
Number of issuance	9999 - 1907 - 044		

Contractors	Waste generator	Transportation company	Waste service company
Company Name	Myanmar Japan Thilawa Development ltd	GEM	
Tel			

Waste	Kind	Name	Style of packing
	☐Non-Hazardous	General waste	
	☐Hazardous	Quantity(Unit)	Remark
	☐Others	1,860 kg	

Customer code	0001	Waste Profile code	

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign)	(Day Month, Year)
Waste service company	(Name&Sign)	(Day Month, Year)

Designed by GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD.

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED MJTD

Manifest C-Slip

*Transportation company to Waste Generator

Date of issuance	(Day Month, Year) 31 - July - 2019	Issuer	(Name&Sign)
Number of issuance	9999 - 1907 - 0267		

Contractors	Waste generator	Transportation company	Waste service company
Company Name	Myanmar Japan Thilawa Development	GEM	GEM
Tel			

	Kind	Name	Style of packing
Waste	☐Non-Hazardous	General waste	
	☐Hazardous	Quantity(Unit)	Remark
	☐Others	1,920 kg	GO1

Customer code	0001	Waste Profile code	GO1

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign) Zaw Naing Win 3K/8896	(Day Month, Year)
Waste service company	(Name&Sign) Phyo Phyo Aye	(Day Month, Year)

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MJTD MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED

Manifest

E-Slip

*Waste service company to Waste Generator

Date of issuance	(Day Month, Year)	Issuer	(Name&Sign)
Number of issuance			

Contractors	Waste generator	Transportation company	Waste service company
Company Name			
Tel			

Waste	Kind	Name	Style of packing
	☑Non-Hazardous		
	☐Hazardous	Quantity(Unit)	Remark
	☐Others		

Customer code		Waste Profile code	

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign)	(Day Month, Year)
Waste service company	(Name&Sign)	(Day Month, Year)

Designed by GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD.

THILAWA DEVELOPMENT LIMITED ★ MYANMAR JAPAN ★ MJTD

Manifest

E-Slip

Date of issuance	(Day Month, Year)	Issuer	(Name&Sign)
Number of issuance			

Contractors	Waste generator	Transportation company
Company Name		
Tel		

Waste	Kind	Name	
	☑Non-Hazardous		
	☐Hazardous	Quantity(Unit)	
	☐Others		

Customer code		Waste Profile code	

Trace	PIC(Name&Sign)	Date of Shipment
Transportation company	(Name&Sign)	(Day Month, Year)
Waste service company	(Name&Sign)	(Day Month, Year)

Designed by GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD.

Manifest

C-Slip

*Transportation company to Waste Generator

GEM - SL - R 010E /06

Date of issuance	(Day Month, Year)	Issuer	(Name&Sign)
Number of issuance			

Contractors	Waste generator	Transportation company	Waste service company
Company Name		GEM	GEM
Tel			

	Kind	Name	Style of packing
Waste	☐Non-Hazardous		
	☐Hazardous	Quantity(Unit)	Remark
	☐Others		

Customer code		Waste Profile code	

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign)	(Day Month, Year)
Waste service company	(Name&Sign)	(Day Month, Year)

Designed by GOLDEN WOWA ECO-SYSTEM MYANMAR CO., LTD.

Manifest

C-Slip

*Transportation company to Waste Generator

GEM - SL - R 010E /00

Date of issuance	(Day Month, Year)	Issuer	(Name&Sign)
Number of issuance			

Contractors	Waste generator	Transportation company	Waste service company
Company Name		GEM	GEM
Tel			

	Kind	Name	Style of packing
Waste	☐Non-Hazardous		
	☐Hazardous	Quantity(Unit)	Remark
	☐Others		

Customer code		Waste Profile code	

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign)	(Day Month, Year)
Waste service company	(Name&Sign)	(Day Month, Year)

Designed by GOLDEN WOWA ECO-SYSTEM MYANMAR CO., LTD.

MYANMAR JAPAN THILAWA DEVELOPMENT LTD. MJTD

Manifest C-Slip

*Transportation company to Waste Generator

GEM - SL - R 010E /00

Date of issuance	(Day Month, Year) 27 - Nov - 2019	Issuer	(Name&Sign)
Number of issuance	1127 - 1905 - 0230		

Contractors	Waste generator	Transportation company	Waste service company
Company Name			
Tel			

Waste	Kind	Name	Style of packing
	☐Non-Hazardous		
	☐Hazardous	Quantity(Unit)	Remark
	☐Others	1080 kg	

Customer code	1	Waste Profile code	1

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign)	(Day Month, Year)
Waste service company	(Name&Sign)	(Day Month, Year)

Designed by GOLDEN WOWA ECO-SYSTEM MYANMAR CO., LTD.

Manifest C-Slip

*Transportation company to Waste Generator

GEM - SL - R 010E /00

Date of issuance	(Day Month, Year) 27 - Nov - 2019	Issuer	(Name&Sign)
Number of issuance	1127 - 1905 - 0231		

Contractors	Waste generator	Transportation company	Waste service company
Company Name			
Tel			

Waste	Kind	Name	Style of packing
	☐Non-Hazardous		
	☐Hazardous	Quantity(Unit)	Remark
	☐Others		

Customer code		Waste Profile code	

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign)	(Day Month, Year)
Waste service company	(Name&Sign)	(Day Month, Year)

Designed by GOLDEN WOWA ECO-SYSTEM MYANMAR CO., LTD.

JAPAN THILAWA DEVELOPMENT LIMITED MYANMAR MJTD

Manifest	C-Slip	*Transportation company to Waste Generator

Date of issuance	(Day Month, Year)	Issuer	(Name&Sign)
Number of issuance			

Contractors	Waste generator	Transportation company	Waste service company
Company Name			
Tel			

Waste	Kind	Name	Style of packing
	☐Non-Hazardous		
	☐Hazardous	Quantity(Unit)	Remark
	☐Others		

Customer code		Waste Profile code	

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign)	(Day Month, Year)
Waste service company	(Name&Sign)	(Day Month, Year)

Designed by GOLDEN WOWA ECO-SYSTEM MYANMAR CO., LTD.

Manifest	C-Slip	*Transportation company to Waste Generator

Date of issuance	(Day Month, Year)	Issuer	(Name&Sign)
Number of issuance			

Contractors	Waste generator	Transportation company	Waste service company
Company Name			
Tel			

Waste	Kind	Name	Style of packing
	☐Non-Hazardous		
	☐Hazardous	Quantity(Unit)	Remark
	☐Others		

Customer code		Waste Profile code	

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign)	(Day Month, Year)
Waste service company	(Name&Sign)	(Day Month, Year)

Designed by GOLDEN WOWA ECO-SYSTEM MYANMAR CO., LTD.

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED MJTD

Manifest — C-Slip

*Transportation company to Waste Generator

GEM - SL - R 010E /00

Date of issuance	(Day Month, Year) 12 - Apr - 2019	Issuer	(Name&Sign)
Number of issuance	9999 - 1904 - 0144		

Contractors	Waste generator	Transportation company	Waste service company
Company Name	Myanmar Japan Thilawa Development Ltd.	GEM	GEM
Tel			

	Kind	Name	Style of packing
Waste	☐Non-Hazardous	STP Dehydrated sludge	
	☐Hazardous	Quantity(Unit)	Remark
	☐Others	5180 kgs	

Customer code	0001	Waste Profile code	A003

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign) Saw min Latt 3R-9145	(Day Month, Year)
Waste service company	(Name&Sign)	(Day Month, Year)

Designed by GOLDEN WOWA ECO-SYSTEM MYANMAR CO., LTD.

Manifest — C-Slip

*Transportation company to Waste Generator

GEM - SL - R 010E /00

Date of issuance	(Day Month, Year)	Issuer	(Name&Sign)
Number of issuance			

Contractors	Waste generator	Transportation company	Waste service company
Company Name			
Tel			

	Kind	Name	Style of packing
Waste	☐Non-Hazardous		
	☐Hazardous	Quantity(Unit)	Remark
	☐Others		

Customer code		Waste Profile code	

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign)	(Day Month, Year)
Waste service company	(Name&Sign)	(Day Month, Year)

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED MJTD

Designed by GOLDEN WOWA ECO-SYSTEM MYANMAR CO., LTD.

Manifest — C-Slip

*Transportation company to Waste Generator

GEM - SL - R 010E /00

Date of issuance	(Day Month, Year)	Issuer	(Name&Sign)
Number of issuance			

Contractors	Waste generator	Transportation company	Waste service company
Company Name			
Tel			

Waste	Kind	Name	Style of packing
	☐Non-Hazardous		
	☐Hazardous	Quantity(Unit)	Remark
	☐Others		

Customer code		Waste Profile code	

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign)	(Day Month, Year)
Waste service company	(Name&Sign)	(Day Month, Year)

Designed by GOLDEN WOWA ECO-SYSTEM MYANMAR CO., LTD.

Manifest — C-Slip

*Transportation company to Waste Generator

GEM - SL - R 010E /00

Date of issuance	(Day Month, Year)	Issuer	(Name&Sign)
Number of issuance			

Contractors	Waste generator	Transportation company	Waste service company
Company Name			
Tel			

Waste	Kind	Name	Style of packing
	☐Non-Hazardous		
	☐Hazardous	Quantity(Unit)	Remark
	☐Others		

Customer code		Waste Profile code	

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign)	(Day Month, Year)
Waste service company	(Name&Sign)	(Day Month, Year)

Designed by GOLDEN WOWA ECO-SYSTEM MYANMAR CO., LTD.

MYANMAR JAPAN THILAWA DEVELOPMENT LTD. MJTD

Manifest C-Slip

*Transportation company to Waste Generator

GEM - SL - R 010E /00

Date of issuance	(Day Month, Year) 15 May 2019	Issuer	(Name&Sign)
Number of issuance	9999 1905 0132		

Contractors	Waste generator	Transportation company	Waste service company
Company Name	Myanmar Japan Thilawa Development Ltd.	GEM	GEM
Tel			

Waste	Kind	Name	Style of packing
	☑Non-Hazardous	STP Dehydrated Sludge	
	☐Hazardous	Quantity(Unit)	Remark
	☐Others	5,320 kg	

Customer code	A001	Waste Profile code	A013

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign) Saw Sein Win 9171 3422	(Day Month, Year)
Waste service company	(Name&Sign) Phyu Phyu Aye	(Day Month, Year)

Designed by GOLDEN WOWA ECO-SYSTEM MYANMAR CO., LTD.

Manifest C-Slip

*Transportation company to Waste Generator

GEM - SL - R 010E /00

Date of issuance	(Day Month, Year) 16 - May - 2019	Issuer	(Name&Sign)
Number of issuance	9999 - 1905 - 0141		

Contractors	Waste generator	Transportation company	Waste service company
Company Name	Myanmar Japan Thilawa Development	GEM	GEM
Tel			

Waste	Kind	Name	Style of packing
	☐Non-Hazardous	STP dehydrated sludge	
	☐Hazardous	Quantity(Unit)	Remark
	☐Others	5,320 kg	

Customer code		Waste Profile code	

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign)	(Day Month, Year)
Waste service company	(Name&Sign)	(Day Month, Year)

Designed by GOLDEN WOWA ECO-SYSTEM MYANMAR CO., LTD.

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED MJTD

Manifest

C-Slip

*Transportation company to Waste Generator

GEM - SL - R 010E /00

Date of issuance	(Day Month, Year) 03 - May - 2019	Issuer	(Name&Sign)
Number of issuance	9999 - 1905 - 0024		

Contractors	Waste generator	Transportation company	Waste service company
Company Name	Myanmar Japan Thilawa Development Ltd.	GEM	GEM
Tel			

Waste	Kind	Name	Style of packing
	☑Non-Hazardous	STP Dehydrated Sludge	
	☐Hazardous	Quantity(Unit)	Remark
	☐Others	5,560 kg	

Customer code	0001	Waste Profile code	0003

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign) Mr. Myint Phyo. 911-3422	(Day Month, Year)
Waste service company	(Name&Sign) Thu Phyu Aye	(Day Month, Year)

Designed by GOLDEN WOWA ECO-SYSTEM MYANMAR CO., LTD.

Manifest

C-Slip

*Transportation company to Waste Generator

GEM - SL - R 010E /00

Date of issuance	(Day Month, Year) 03 - May - 2019	Issuer	(Name&Sign)
Number of issuance	9999 - 1905 - 0024		

Contractors	Waste generator	Transportation company	Waste service company
Company Name	Myanmar Japan Thilawa Development Ltd.	GEM	GEM
Tel			

Waste	Kind	Name	Style of packing
	☐Non-Hazardous	STP Dehydrated Sludge	
	☐Hazardous	Quantity(Unit)	Remark
	☐Others	5,560 kg only	

Customer code		Waste Profile code	

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign)	(Day Month, Year)
Waste service company	(Name&Sign)	(Day Month, Year)

Designed by GOLDEN WOWA ECO-SYSTEM MYANMAR CO., LTD.

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED MJTD

Manifest — C-Slip

*Transportation company to Waste Generator

Date of issuance	(Day Month, Year) 30-July-2019	Issuer	(Name&Sign)
Number of issuance	9999-1907-0278		

Contractors	Waste generator	Transportation company	Waste service company
Company Name	Myanmar Japan Thilawa Development Co Ltd	GEM	GEM
Tel			

Waste	Kind	Name	Style of packing
	☐Non-Hazardous	STP dehydrated sludge	
	☑Hazardous	Quantity(Unit)	Remark
	☐Others	6,260 kg	B001

Customer code	0001	Waste Profile code	A003

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign) Mi Mi Htwe. 3k 4145	(Day Month, Year)
Waste service company	(Name&Sign) Phyu Phyu Aye	(Day Month, Year)

Designed by GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD. GEM-SL-R-010E /00

Manifest — C-Slip

*Transportation company to Waste Generator GEM-SL-R-010E/00

Date of issuance	(Day Month, Year) 23 July 2019	Issuer	(Name&Sign) L.K.K.A
Number of issuance	9999-1907-0208		

Contractors	Waste generator	Transportation company	Waste service company
Company Name	Myanmar Japan Thilawa Development Ltd	GEM	GEM
Tel			

Waste	Kind	Name	Style of packing
	☐Non-Hazardous	STP dehydrated sludge	
	☑Hazardous	Quantity(Unit)	Remark
	☐Others	6,300 kg	B001

Customer code	0001	Waste Profile code	A003

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign) Mi Mi Htwe. 3k. 9145	(Day Month, Year)
Waste service company	(Name&Sign)	(Day Month, Year)

MYANMAR THILAWA DEVELOPMENT LIMITED MJTD

Designed by GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD.

Manifest	C-Slip	*Transportation company to Waste Generator

Date of issuance	(Day Month, Year) 03 - July - 2019	Issuer	(Name&Sign)
Number of issuance	9999 - 1907 - 0038		

Contractors	Waste generator	Transportation company	Waste service company
Company Name	Myanmar Japan Thilawa Development Ltd	GEM	GEM
Tel			

	Kind	Name	Style of packing
Waste	☐Non-Hazardous	STP Dehydrated Sludge	
	☑Hazardous	Quantity(Unit)	Remark
	☐Others	5,800 kg	

Customer code	0001	Waste Profile code.	A003

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign) 34/9145	(Day Month, Year)
Waste service company	(Name&Sign) Phyu Phyu Aye	(Day Month, Year)

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MYANMAR JAPAN THILAWA DEVELOPMENT MJTD

Manifest — C-Slip

*Transportation company to Waste Generator

Date of issuance	(Day Month, Year) 28 - Aug - 2019	Issuer	(Name&Sign)
Number of issuance	0009 - 1908 - 0236		

Contractors	Waste generator	Transportation company	Waste service company
Company Name	Myanmar Japan Thilawa Development	GEM	MJTD
Tel			

	Kind	Name	Style of packing
Waste	☐Non-Hazardous	SIP Dehydrated Sludge	
	☐Hazardous	Quantity(Unit)	Remark
	☐Others	5,800 kg	

Customer code	0001	Waste Profile code	

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign) Zaw Naing Win 31<19145	(Day Month, Year)
Waste service company	(Name&Sign) Phyu Phyu Nyo	(Day Month, Year)

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MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED MJTD

Manifest C-Slip

*Transportation company to Waste Generator

Date of issuance	(Day Month, Year) 15 - Aug - 2019	Issuer	(Name&Sign)
Number of issuance	9999 - 1908 - 0110		

Contractors	Waste generator	Transportation company	Waste service company
Company Name	Myanmar Japan Thilawa Development Ltd.	GEM	GEM
Tel			

Waste	Kind	Name	Style of packing
	☑Non-Hazardous	STP Dehydrated sludge	
	☐Hazardous	Quantity(Unit)	Remark
	☐Others	6,140 kg	

Customer code	0001	Waste Profile code	

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign) San min Latt San 3R-9145	(Day Month, Year)
Waste service company	(Name&Sign) Phyu Phyu Aye	(Day Month, Year)

Designed by GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD. GEM-SL-R 010E /00

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