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Thilawa Special Economic Zone (Zone B) Development

Environmental Monitoring Report Phase-1,2 and 3 (Operation Phase)

Myanmar Japan Thilawa Development Limited.

September 2024

CONTENTS

Appendix

1. Executive Summary

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

The monitoring record from March 2024 to August 2024 according to the Environment Monitoring Plan is submitted in conformity with the provision of Chapter 10, 10.1 Table 10.1-3 and 10.2, Table 10.2-3 Content of the EIA Report of Thilawa SEZ Development Project (Zone B).

2. Summary of Monitoring Activities

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

We submitted EMP for TSEZ Zone-B as following table.

Report No.	Description	Phase	Submission
1	Environmental Monitoring Report	Phase-1 Operation Phase	September, 2019
2	Environmental Monitoring Report	Phase-1 & 2 Operation Phase	March, 2020
3	Environmental Monitoring Report	Phase-1 & 2 Operation Phase	September, 2020
4	Environmental Monitoring Report	Phase-1 & 2 Operation Phase	March, 2021
5	Environmental Monitoring Report	Phase-1,2 & 3 Operation Phase	September, 2021
6	Environmental Monitoring Report	Phase-1,2 & 3 Operation Phase	March, 2022
7	Environmental Monitoring Report	Phase-1,2 & 3 Operation Phase	September, 2022
8	Environmental Monitoring Report	Phase-1,2 & 3 Operation Phase	March, 2023
9	Environmental Monitoring Report	Phase-1,2 & 3 Operation Phase	September, 2023
10	Environmental Monitoring Report	Phase-1,2 & 3 Operation Phase	March, 2024
11	Environmental Monitoring Report	Phase-1,2 & 3 Operation Phase	September, 2024

Report (No.11 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;

None

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

- Depend on the exceeding parameters and situation

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

Please refer to the attached Environmental Monitoring Form.

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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 10.2-3, Chapter 10, EIA for Industrial Area of Zone-B.

Monitoring Plan (Operation Phase)

Category	Item	Location	Frequency	Remark
Air Quality	NO_2, SO_2, CO, $PM_{2.5}$, PM_{10}	Representative point inside the projectarea	1 week each in the dry and rainy seasons	June 2024, Air Quality Monitoring Report
Water Quality	Water temperature, pH, SS, DO, BOD5, COD, color and odor, Total Nitrogen, Total Phosphorus, Sulphide, HCN, Oil, Grease, Formaldehyde, Phenols, Free chlorine, Zinc, Chromium, Arsenic, Copper, Mercury, Cadmium, Barium, Selenium, Lead, and Nickel	Outflow of retention pond to the creek (at least 3 sampling points/mixing point: discharge water, upstream water, and downstream water)	With Third Party Every 2 month: Water temperature, pH, SS, DO, BOD_5, COD, color and odor, Every 6 month : all parameters Note: Self-monitoring purpose analyze all parameters every month for environment safety purpose	February 2024, April 2024 Water and Wastewater Quality Monitoring Report (Bi-monthly report) June 2024 Water and Wastewater Quality Monitoring Report (Bi-annually report) National Surface Water Quality Standard (Myanmar) will be referred and included in December 2024
Waste	-Amount of Non-hazardous waste management -Amount of hazardous waste management	Each Tenant	Twice/year (Submission of the environmental report by the tenants)	General waste disposal record
Soil Contamination	-Status of control of solid and liquid waste which causes soil contamination	Each Tenant	Twice/year (Submission of the environmental report by the tenants)	Monitoring will be started when the whole Zone-B is in Operation Stage
Noise and Vibration	- Noise and vibration level - Traffic Count	Tenants including Project Proponent	One time each in the dry and rainy seasons	Noise and Vibration Monitoring Report June 2024 Traffic Count Monitoring Report June 2024
Offensive Odor	- Status offensive odor control by the tenants	Each tenant	Twice/year (submission of the environmental report by tenants)	This is responsible by each tenant
Bottom Sediment	-Water quality monitoring (as indicator of the pollution of the bottom sediment)	Same as the water quality monitoring	-Additional analysis on the bottom sediment of creek, in case of finding continuous high concentration	Refer in Environmental Monitoring report
Hydrological Situation	-Checking the function of retention pond at heavy rain	Retention Pond	When the heavy rain	
Living and Livelihood/ Vulnerable Group/ Misdistribution of Benefit and Damage/ Children's Right	-The implementation status for CSR activities such as community support program	Around Project Site	Once/year	Refer in Environmental Monitoring report
Risks for Infections Disease such as AIDS/HIV	-Status of measure against infectious diseases	Each tenant	Twice/year (Submission of the environmental report by the tenants	

Category	Item	Location	Frequency	Remark
Occupational Health and Safety	-Record of accident and infectious diseases	Work site and office	Twice/year (Submission of the environmental report by the tenants)	-
Community Health and Safety	Record of accidents and infectious diseases related to the community	Around the project site	Twice/year	Refer in Environmental Monitoring form
	The implementation status for CSR activities such as community support program	Around project site	Once/year	Refer in Environmental Monitoring form
Usage of Chemicals	Record of the type and quantity of chemicals and implementation status of control measures through self-inspection	Each tenant (that uses chemicals)	Biannually	-

*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 B– Phase 1,2 & 3 (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 (Industrial Area of Zone B). Should there be any changes to the original plan, such change shall be reviewed and evaluated by environmental expert.

(1) General

1) Phase of the Project

- Please mark the current phase.

☐ Pre-Construction Phase ☐ Construction Phase ☑ Operation Phase

2) Obtainment of Environmental Permits

Name of permits	Expected issuance date	Actual issuance date	Concerned authority	Remarks (Conditions, etc.)
Approved letter for Environmental Impact Assessment (EIA) Report of Industrial Area, Thilawa Special Economic Zone (Zone-B)		29th December 2016	Thilawa SEZ Management Committee	
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 Special Economic Zone	5th January 2018	10th January 2018	Thilawa SEZ Management Committee	

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

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

(2) Monitoring Results

1) Ambient Air Quality (June 2024)

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

Location	Item	Unit	Measured Value (Mean)	Measured Value (Max)	Country's Standard*2	Target value to be applied*1	Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
AQ-1 (Monastery Compound of Phalan Village)	NO_2	mg/m³	0.029	0.076	0.2 mg/m³ (1 Hour)	0.1 mg/m³ (24 Hour)	-	One time / 6 months	Haz-Scanner EPAS	Refer to air quality report
	SO_2	mg/m³	0.011	0.045	0.02 mg/m³ (24 Hours)	0.02 mg/m³ (24 Hours)	-			
	CO	mg/m³	0.077	0.773	-	10.26 mg/m³ (24 Hours)	-			
	PM2.5	mg/m³	0.009	0.060	0.025 mg/m³ (24 Hours)	0.025 mg/m³ (24 Hours)	-			
	PM10	mg/m³	0.019	0.083	0.05 mg/m³ (24 Hours)	0.05 mg/m³ (24 Hours)	-			

*1**Remarks:** Referred to the tentative target value of ambient air quality (Thilawa SEZ-B EIA Report for industrial area, Table 2.4-1), Reference to the air quality monitoring report (June 2024)

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

Complaints from Residents

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

Contents of Complaints from Residents	Countermeasures

2) (a) Water Quality – February 2024

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

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

Location	Item	Unit	Measured Value (Max)	Country's Standard*2	Target value to be applied*1	Frequency	Method	Note (Reason of excess of the standard)
SW-2 (Reference point) Sampling on 6 February 2024	Temperature	°C	22	< 3 (increase)	≤ 35	Once per 2 months	Instrument Analysis Method	Refer to water quality report
	pH	-	6.8	6-9	6.0 – 9.0		Instrument Analysis Method	
	Suspended Solids (SS)	mg/L	20	50	Max 50		APHA 2540D (Dry at 103-105°C Method)	
	Dissolved Oxygen (DO)	mg/L	3.88	-	-		Instrument Analysis Method	
	BOD_5	mg/L	11.63	50	Max 30		APHA 5210 B (5days BOD Test)	
	COD_{Cr}	mg/L	36.8	250	Max 125		APHA 5220 D (Close Reflux Colorimetric Method)	
	Total Nitrogen (T-N)	mg/L	2.8	-	Max. 80		HACH Method 10072 (TNT Persulfate Digestion Method)	
	Total Phosphorous (T-P)	mg/L	0.21	2	Max. 2		APHA 4500-PE (Ascorbic Acid Method)	
							APHA 2120C (Spectrophotometric Method)	

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Location	Item	Unit	Measured Value (Max)	Country's Standard*2	Target value to be applied*1	Frequ-ency	Method	Note (Reason of excess of the standard)
SW-2 (Reference point) Sampling on 6 February 2024	Color	TCU	18.43	-	150 Co.Pt *		APHA 2150B (Threshold Odor Test)	Refer to water quality report
	Odor	TON	1	-	-		APHA 9221 B (Standard Total Coliform Fermentation Technique)	
	Total Coliform*4	MPN/100ml	>160000	400	Max 400		APHA 5520 B (partition Gravimetric Method)	
	Oil and Grease	mg/L	<3.1	10	Max 10		APHA 2540C (Total Dissolved Solids Dried at 180.C)	
	Total Dissolved solids (TDS) *6	mg/L	1932	-	Max 2000		APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	
	Iron*6,	mg/L	1.164	3.5	Mas 3.5		APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	
	Mercury*6	mg/L	≤ 0.002	0.01	Max 0.005			
SW-4 (Reference point) Sampling on 6 February 2024	Temperature	°C	26	< 3 (increase)	≤ 35	Once per 2 months	Instrument Analysis Method	Refer to water quality report
	pH	-	8	6-9	6.0 – 9.0		Instrument Analysis Method	
	Suspended Solids (SS)*3	mg/L	528	50	Max 50		APHA 2540D (Dry at 103-105°C Method)	
	Dissolved Oxygen (DO)	mg/L	5.22	-	-		Instrument Analysis Method	
	BOD5	mg/L	3.5	50	Max 30		APHA 5210 B (5days BOD Test)	
	CODCr	mg/L	11.7	250	Max 125		APHA 5220 D (Close Reflux Colorimetric Method)	
	Total Nitrogen (T-N)	mg/L	7.1	-	Max. 80		HACH Method 10072 (TNT Persulfate Digestion Method)	
	Total Phosphorous (T-P)	mg/L	1.05	2	Max. 2		APHA 4500-PE (Ascorbic Acid Method)	
	Color	TCU	11.29	-	150 Co.Pt *		APHA 2120C (Spectrophotometric Method)	
	Odor	TON	1	-	-		APHA 2150B (Threshold Odor Test)	
	Total Coliform*4	MPN/100ml	>160000	400	Max 400		APHA 9221 B (Standard Total Coliform Fermentation Technique)	
	Oil and Grease	mg/L	<3.1	10	Max 10		APHA 5520 B (partition Gravimetric Method)	
	Total Dissolved solids (TDS) *6	mg/L	604	-	Max 2000		APHA 2540C (Total Dissolved Solids Dried at 180.C)	
	Iron*6, *5	mg/L	24	3.5	Mas 3.5		APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	
	Mercury*6	mg/L	≤ 0.002	0.01	Max 0.005		APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	
SW-7 (Discharged Point)	Temperature	°C	23	< 3 (increase)	≤ 35	Once per 2	Instrument Analysis Method	Refer to water quality
	pH	-	7.1	6-9	6.0 – 9.0		Instrument Analysis Method	

Location	Item	Unit	Measured Value (Max)	Country's Standard*2	Target value to be applied*1	Frequ-ency	Method	Note (Reason of excess of the standard)
SW-7 (Discharged Point) SW-7 Sampling on 6 February 2024	Suspended Solids (SS)	mg/L	36	50	Max 50	months	APHA 2540D (Dry at 103-105°C Method)	report
	Dissolved Oxygen (DO)	mg/L	5.08	-	-		Instrument Analysis Method	
	BOD5	mg/L	6.61	50	Max 30		APHA 5210 B (5days BOD Test)	
	CODCr	mg/L	17.3	250	Max 125		APHA 5220 D (Close Reflux Colorimetric Method)	
	Total Nitrogen (T-N)	mg/L	3.2	-	Max. 80		HACH Method 10072 (TNT Persulfate Digestion Method)	
	Total Phosphorous (T-P)	mg/L	0.20	2	Max. 2		APHA 4500-PE (Ascorbic Acid Method)	
	Color	TCU	8.3	-	150 Co.Pt *		APHA 2120C (Spectrophotometric Method)	
	Odor	TON	1.4	-	-		APHA 2150B (Threshold Odor Test)	
	Total Coliform*7	MPN/100ml	1,400	400	Max 400		APHA 9221 B (Standard Total Coliform Fermentation Technique)	
	Oil and Grease	mg/L	<3.1	10	Max 10			
	Total Dissolved solids (TDS) *6	mg/L	386	-	Max 2000		APHA 5520 B (partition Gravimetric Method) APHA 2540C (Total Dissolved Solids Dried at 180.C)	
	Iron*6,*5	mg/L	3.536	3.5	Mas 3.5		APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	
	Mercury*6	mg/L	≤ 0.002	0.01	Max 0.005		APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	
GW-2 (Reference point) Sampling on 6 February 2024	Temperature	°C	27	< 3 (increase)	-	Once per 2 months	Instrument Analysis Method	Refer to water quality report
	pH	-	6.3	6-9	5.5-8.5		Instrument Analysis Method	
	Suspended Solids (SS)	mg/L	2	50	-		APHA 2540D (Dry at 103-105°C Method)	
	Dissolved Oxygen (DO)	mg/L	7.95	-	-		Instrument Analysis Method	
	BOD5	mg/L	5.93	50	-		APHA 5210 B (5days BOD Test)	
	CODCr	mg/L	< 0.7	250	-		APHA 5220 D (Close Reflux Colorimetric Method)	
	Total Nitrogen (T-N)	mg/L	0.7	-	-		HACH Method 10072 (TNT Persulfate Digestion Method)	
	Total Phosphorous (T-P)	mg/L	0.67	2	-		APHA 4500-PE (Ascorbic Acid Method)	
	Color	TCU	43.53	-			APHA 2120C (Spectrophotometric Method)	
	Odor	TON	1	-	-		APHA 2150B (Threshold Odor Test)	
	Total Coliform*8	MPN/100ml	1600	400	3		APHA 9221 B (Standard Total Coliform Fermentation Technique)	
	Oil and Grease	mg/L	< 3.1	10	-		APHA 5520 B (partition Gravimetric Method)	Refer to water

Location	Item	Unit	Measured Value (Max)	Country's Standard*2	Target value to be applied*1	Frequ-ency	Method	Note (Reason of excess of the standard)
GW-2 (Reference point)	Total Dissolved solids (TDS) *6	mg/L	168	-	1500		APHA 2540C (Total Dissolved Solids Dried at 180.C)	quality report
	Iron*6, *9	mg/L	5.252	3.5	5		APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	
	Mercury*6		≤ 0.002	0.01	0.001		APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	

*1Remark: Reference to the Water and Wastewater Quality Monitoring Report (February 2024). February 2024 water quality report was received in this monitoring period of March 2024 to August 2024.

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

*3Remark: SS results exceeded in the monitoring point of SW-4 than the target value be due to two expected reasons; i) delivered from upstream area such as natural origin and wastewater from local industrial zone which is located outside of Thilawa SEZ, and ii) influence by water from the downstream of monitoring points due to backflow by tidal fluctuation along Shwe Pyauk creek.

*4Remark: For the monitoring point of SW2 and SW-4 the result of total coliform exceeded than the target value due to three expected reasons: i) the existing of various kinds of vegetation and aquatic animals, especially fecal contamination from the animals, ii) heavy rainfall and stormwater runoff can wash contaminants from the surroundings into Shwe Pyauk creek, and this runoff may contain fecal matter and other pollutants, leading to increased coliform levels, and iii) incoming tidal water can contain the fecal matter and delivered along Shwe Pyauk creek during flood tide.

*5 Remark: For the monitoring point of SW-4 and SW-7 the results of Iron exceeded. The possible reasons may be due to the influence of natural origin (iron can reach out from soil by run-off). Surroundings of the Thilawa SEZ especially small hilly areas are mainly composed of iron rich soil (lateritic soil), and it can be transported to the low land area by strong wind.

*6 Remark: Recommendation from JICA Environmental expert (TSMC), to be more emphasized on Environmental and analyzing only.

*7 Remark: For the monitoring point of SW-7, the results of T-Coli exceeded due to expected reason i) natural bacteria existed in all area of Zone B because the existing of various kinds of vegetation and aquatic animals, especially fecal contamination from the animals, and the heavy rainfall and stormwater runoff can wash contaminants from the surroundings into the retention pond, and this runoff may contain fecal matter and other pollutants, leading to increased coliform levels. Total coliforms do not affect human health directly, self-monitoring was carried out to identify health impact by coliform bacteria. As for the result of E-Coli SW-7 was 24. It is considered that there is no

significant impact to human health.

*8 Remark: For the monitoring point of GW-2, T-Coli exceeded due to possible reasons may be due to the poor maintenance of well which can increase the risk of bacteria and other harmful organisms.

*9 Remark: For the monitoring point of GW-2, Iron exceeded due to possible reasons may due to the influence of natural origin (iron can reach out from soil by run-off). Moreover, Thilawa SEZ area is mainly composed of iron rich soil (lateritic soil), and it can be saturated in the underlying confined aquifer.

Note: Ground water for GW-2, it was compared with Vietnam Groundwater Standard (No: QCVN 09-MT:2015/BTNMT) above table and at the Appendix Attachment of Water Quality Monitoring Report (February 2024). In February 2024 Report, GW-2 only compare with Vietnam Groundwater Standard.

2) (b) Water Quality – April 2024

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

- Are there any effluents to water body in this monitoring period? ☐ Yes, ☑ No

If yes, please attach "Analysis Record" and fill in the items not to comply with Refereed International Standard

Location	Item	Unit	Measured Value (Max)	Country's Standard*2	Target value to be applied*1	Frequency	Method	Note (Reason of excess of the standard)
SW-2 (Reference point) Sampling on 24 April 2024	Temperature	°C	30	< 3 (increase)	≤ 35	Once per 2 months	Instrument Analysis Method	Refer to water quality report
	pH	-	7.1	6-9	6.0 – 9.0		Instrument Analysis Method	
	Suspended Solids (SS)*3	mg/L	70	50	Max 50		APHA 2540D (Dry at 103-105°C Method)	
	Dissolved Oxygen (DO)	mg/L	4.65	-	-		Instrument Analysis Method	
	BOD5	mg/L	11.67	50	Max 30		APHA 5210 B (5days BOD Test)	
	CODCr	mg/L	33.1	250	Max 125		APHA 5220 D (Close Reflux Colorimetric Method)	
	Total Nitrogen (T-N)	mg/L	0.9	-	Max. 80		HACH Method 10072 (TNT Persulfate Digestion Method)	
	Total Phosphorous (T-P)	mg/L	< 0.05	2	Max. 2		APHA 4500-PE (Ascorbic Acid Method)	

Location	Item	Unit	Measured Value (Max)	Country's Standard*2	Target value to be applied*1	Frequ-ency	Method	Note (Reason of excess of the standard)
SW-2 (Reference point)	Color	TCU	15.50	-	150 Co.Pt *		APHA 2120C (Spectrophotometric Method)	
	Odor	TON	1.4	-	-		APHA 2150B (Threshold Odor Test)	
	Total Coliform*4	MPN/100 ml	24000	400	Max 400		APHA 9221 B (Standard Total Coliform Fermentation Technique)	
	Oil and Grease	mg/L	<3.1	10	Max 10		APHA 5520 B (partition Gravimetric Method)	
	Total Dissolved solids (TDS) *6	mg/L	3258	-	Max 2000		APHA 2540C (Total Dissolved Solids Dried at 180.C)	
	Iron*6	mg/L	4.020	3.5	Mas 3.5		APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	
	Mercury*6	mg/	≤ 0.002	0.01	Max 0.005		APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	
SW-4 (Reference point) Sampling on 24 April 2024	Temperature	°C	30	< 3 (increase)	≤ 35	Once per 2 months	Instrument Analysis Method	Refer to water quality report
	pH	-	7.5	6-9	6.0 – 9.0		Instrument Analysis Method	
	Suspended Solids (SS)*3	mg/L	198	50	Max 50		APHA 2540D (Dry at 103-105°C Method)	
	Dissolved Oxygen (DO)	mg/L	4.99	-	-		Instrument Analysis Method	
	BOD5	mg/L	10.31	50	Max 30		APHA 5210 B (5days BOD Test)	
	CODCr	mg/L	21.6	250	Max 125		APHA 5220 D (Close Reflux Colorimetric Method)	
	Total Nitrogen (T-N)	mg/L	1.5	-	Max. 80		HACH Method 10072 (TNT Persulfate Digestion Method)	
	Total Phosphorous (T-P)	mg/L	0.14	2	Max. 2		APHA 4500-PE (Ascorbic Acid Method)	
	Color	TCU	8	-	150 Co.Pt *		APHA 2120C (Spectrophotometric Method)	
	Odor	TON	1.4	-	-		APHA 2150B (Threshold Odor Test)	
	Total Coliform*4	MPN/100 ml	>160000	400	Max 400		APHA 9221 B (Standard Total Coliform Fermentation Technique)	
	Oil and Grease	mg/L	<3.1	10	Max 10		APHA 5520 B (partition Gravimetric Method)	
	Total Dissolved solids (TDS) *6, *3	mg/L	3700	-	Max 2000		APHA 2540C (Total Dissolved Solids Dried at 180.C)	
	Iron*6, *5	mg/L	22.080	3.5	Mas 3.5		APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	
	Mercury*6	mg/	≤ 0.002	0.01	Max 0.005		APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	
SW-7	Temperature	°C	32	< 3 (increase)	≤ 35	Once	Instrument Analysis Method	
	pH	-	8.0	6-9	6.0 – 9.0		Instrument Analysis Method	

Location	Item	Unit	Measured Value (Max)	Country's Standard*2	Target value to be applied*1	Frequ-ency	Method	Note (Reason of excess of the standard)
SW-7 (Discharged Point) Sampling on 24 April 2024	Suspended Solids (SS)	mg/L	38	50	Max 50	per 2 months	APHA 2540D (Dry at 103-105°C Method)	Refer to water quality report
	Dissolved Oxygen (DO)	mg/L	6.89	-	-		Instrument Analysis Method	
	BOD5	mg/L	14.77	50	Max 30		APHA 5210 B (5days BOD Test)	
	CODCr	mg/L	25.3	250	Max 125		APHA 5220 D (Close Reflux Colorimetric Method)	
	Total Nitrogen (T-N)	mg/L	0.7	-	Max. 80		HACH Method 10072 (TNT Persulfate Digestion Method)	
	Total Phosphorous (T-P)	mg/L	< 0.05	2	Max. 2		APHA 4500-PE (Ascorbic Acid Method)	
	Color	TCU	8	-	150 Co.Pt *		APHA 2120C (Spectrophotometric Method)	
	Odor	TON	1	-	-		APHA 2150B (Threshold Odor Test)	
	Total Coliform*7	MPN/100 ml	>160000	400	Max 400		APHA 9221 B (Standard Total Coliform Fermentation Technique)	
	Oil and Grease	mg/L	<3.1	10	Max 10		APHA 5520 B (partition Gravimetric Method)	
	Total Dissolved solids (TDS) *6, *8	mg/L	3580	-	Max 2000		APHA 2540C (Total Dissolved Solids Dried at 180.C)	
	Iron*6, *9	mg/L	3.7	3.5	Mas 3.5		APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	
	Mercury*6	mg/	≤ 0.002	0.01	Max 0.005		APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	
GW-2 (reference point) Sampling on 24 April 2024	Temperature	°C	28	< 3 (increase)	≤ 35	Once per 2 months	Instrument Analysis Method	Refer to water quality report
	pH	-	6.3	6-9	6.0 – 9.0		Instrument Analysis Method	
	Suspended Solids (SS)	mg/L	46	50	Max 50		APHA 2540D (Dry at 103-105°C Method)	
	Dissolved Oxygen (DO)	mg/L	6.44	-	-		Instrument Analysis Method	
	BOD5	mg/L	3.78	50	Max 30		APHA 5210 B (5days BOD Test)	
	COD_{Cr}	mg/L	<0.7	250	Max 125		APHA 5220 D (Close Reflux Colorimetric Method)	
	Total Nitrogen (T-N)	mg/L	<0.5	-	Max. 80		HACH Method 10072 (TNT Persulfate Digestion Method)	
	Total Phosphorous (T-P)	mg/L	0.52	2	Max. 2		APHA 4500-PE (Ascorbic Acid Method)	
	Color	TCU	71.75	-	150 Co.Pt *		APHA 2120C (Spectrophotometric Method)	
	Odor	TON	1	-	-		APHA 2150B (Threshold Odor Test)	
	Total Coliform*10	MPN/100 ml	24000	400	Max 400		APHA 9221 B (Standard Total Coliform Fermentation Technique)	
	Oil and Grease	mg/L	<3.1	10	Max 10		APHA 5520 B (partition Gravimetric Method)	

Location	Item	Unit	Measured Value (Max)	Country's Standard*2	Target value to be applied*1	Frequ-ency	Method	Note (Reason of excess of the standard)
GW-2 (reference point)	Total Dissolved solids (TDS) *6	mg/L	202	-	Max 2000		APHA 2540C (Total Dissolved Solids Dried at 180.C)	
	Iron*6, *11	mg/L	12.720	3.5	Max 3.5		APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	
	Mercury*6	mg/	≤ 0.002	0.01	Max 0.005		APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	

*1Remark: Reference to the Water and Wastewater Quality Monitoring Report (April 2024)

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

*3Remark: For the monitoring point of SW-2 and SW-4 SS and TDS exceeded than the target value may be due to two expected reasons; i) delivered from upstream area such as natural origin and wastewater from local industrial zone which is located outside of Thilawa SEZ, and ii) influence by water from the downstream of monitoring points due to backflow by tidal fluctuation along Shwe Pyauk creek.

*4Remark: For the monitoring point of SW-2 and SW4 the result of total coliform exceeded than the target value due to three expected reasons: i) the existing of various kinds of vegetation and aquatic animals, especially fecal contamination from the animals, ii) contaminants from the surroundings into the Shwe Pyauk creek may contain fecal matter and other pollutants, leading to increase coliform levels and iii) incoming tidal water can contain the fecal matter and delivered along Shwe Pyauk creek during flood tide.

*5 Remark: For the monitoring point of SW-2 and SW-4 the results of Iron exceeded than target value may be due to the influence of natural origin (iron can reach out from the soil by run-off). Surroundings of the Thilawa SEZ especially small hilly areas are mainly composed of iron rich soil (lateritic soil), and it can be transported to the low land area by run-off or strong wind.

*6 Remark: Recommendation from JICA Environmental expert (TSMC), to be more emphasized on Environmental and analyzing only.

*7 Remark: For the monitoring point of SW-7, the results of T-Coli exceeded due to expected reason it might be natural bacteria existed in all area of Zone B because the existing of various kinds of vegetation and aquatic animals, especially fecal contamination from the animals, and the contaminants from the surroundings into the retention pond may contain fecal matter and other pollutants, leading to increase coliform levels. Total coliforms do not affect human health directly, self-monitoring was carried out to identify health impact by coliform bacteria. As for the result of E-Coli SW-7 was <1.8. It is considered that there is no significant impact to human health.

*8 Remark: For the monitoring point of SW-7, TDS exceeded due to the surface water run-off from bare land in Zone B.

*9 Remark: For the monitoring point of SW-7, Iron exceeded may be due to the influence of natural origin (iron can reach out from soil by run-off). Surroundings of the Thilawa

SEZ especially small hilly areas are mainly composed of iron rich soil (lateritic soil), and it can be transported to the low land area by strong wind. Moreover, iron remains in the natural environment for a long time.

*10 Remark: For the monitoring point of GW-2, the results of Total Coliform exceeded the expected reason due to the poor maintenance of well which can increase the risk of bacteria and other harmful organisms. Total coliforms do not affect human health directly, self-monitoring was carried out to identify health impact by coliform bacteria. As for the result of E-Coli GW-2 was <1.8. It is considered that there is no significant impact to human health.

*11 Remark: For the monitoring point of GW-2 the results of Iron exceeded the possible reasons may due to the influence of natural origin (iron can reach out from soil by run-off). Moreover, Thilawa SEZ area is mainly composed of iron rich soil (lateritic soil), and it can be saturated in the underlying confined aquifer.

2) (c) Water Quality – June 2024

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

- Are there any effluents to water body in this monitoring period? ☐ Yes, ☑ No

If yes, please attach "Analysis Record" and fill in the items not to comply with Refereed International Standard

Location	Item	Unit	Measured Value (Max)	Country's Standard*2	Target value to be applied*1	Frequency	Method	Note (Reason of excess of the standard)
SW-2 (Reference point) Sampling on 6 June 2024	Temperature	˚C	29	< 3 (increase)	≤ 35	Once per 6 months	Instrument Analysis Method	Refer to water quality report
	pH	-	6	6-9	6~9		Instrument Analysis Method	
	Suspended Solids (SS)	mg/L	30	50	Max 50		APHA 2540 D Method	
	Dissolved Oxygen (DO)	mg/L	3.12	-	-		Instrument Analysis Method	
	BOD (5)	mg/L	15.67	50	Max 30		APHA 5210 B Method	
	COD (Cr)	mg/L	31.3	250	Max 125		APHA 5220D Method	
	Total Coliform*4	MPN/100 ml	92000	400	Max 400		APHA 9221B Method	
	Total Nitrogen (T-N)	mg/L	< 0.5	-	Max 80		HACH Method 10072 Method	
	Total Phosphorous (T-P)	mg/L	0.22	2	Max 2		APHA 4500-P E Method	
	Color	TCU	78.63	-	Max 150		APHA 2120C Method	
	Odor	TON	3	-	-		APHA 2150 B Method	

Location	Item	Unit	Measured Value (Max)	Country's Standard*2	Target value to be applied*1	Frequ-ency	Method	Note (Reason of excess of the standard)
SW-2 (Reference point) Sampling on 6 June 2024	Oil and Grease	mg/L	<3.1	10	Max 10		APHA 5520B Method	Refer to water quality report
	Mercury	mg/L	≤ 0.002	0.01	Max 0.005		APHA 3120 B Method	
	Zinc	mg/L	≤ 0.002	2	Max 2		APHA 3120 B Method	
	Arsenic	mg/L	≤ 0.010	0.1	Max 0.1		APHA 3120 B Method	
	Chromium	mg/L	≤ 0.002	0.5	Max 0.5		APHA 3120 B Method	
	Cadmium	mg/L	≤ 0.002	0.1	Max 0.03		APHA 3120 B Method	
	Selenium	mg/L	≤ 0.010	0.1	Max 0.02		APHA 3120 B Method	
	Lead	mg/L	≤ 0.002	0.1	Max 0.1		APHA 3120 B Method	
	Copper	mg/L	≤ 0.002	0.5	Max 0.5		APHA 3120 B Method	
	Barium	mg/L	0.020	-	Max 1		APHA 3120 B Method	
	Nickel	mg/L	≤ 0.002	0.5	Max 0.2		APHA 3120 B Method	
	Cyanide	mg/L	< 0.002	0.1	Max 0.1		HACH 8027 Method	
	Total Cyanide	mg/L	0.002	1	Max 1		APHA 4500-CN-C Method	
	Free Chlorine	mg/L	<0.1	-	Max 1		APHA 4500-CL G Method	
	Sulphide (S_2 -)	mg/L	0.059	1	Max 1		HACH 8131 Method	
	Formaldehyde	mg/L	0.070	-	Max 1		HACH 8110 Method	
	Phenols	mg/L	0.015	0.5	Max 0.5		USEPA Method 420.1	
	Iron	mg/L	2.980	3.5	Max 3.5		APHA 3120 B Method	
	Total Dissolved Solids	mg/L	122	-	Max 2000		APHA 2540 C Method	
	Total Residual Chlorine	mg/L	0.1	0.2	Max 0.2		APHA 4500-CL G Method	
	Chromium (Hexavalent)	mg/L	< 0.05	0.1	Max 0.1		ISO 11083:1994 Method	
	Ammonia	mg/L	0.03	10	Max 10		HACH Method 10205 Method	
	Fluoride	mg/L	0.027	20	Max 20		APHA 4110 B Method	
	Silver	mg/L	≤ 0.002	0.5	Max 0.5		APHA 3120 B Method	
SW-4 (Reference point) Sampling on 6 June 2024	Temperature	℃	29	< 3 (increase)	≤ 35	Once per 6 months	Instrument Analysis Method	Refer to water quality report
	pH	-	6.2	6-9	6~9		Instrument Analysis Method	
	Suspended Solids (SS)*3	mg/L	70	50	Max 50		APHA 2540 D Method	
	Dissolved Oxygen (DO)	mg/L	3.33	-	-		Instrument Analysis Method	
	BOD (5)	mg/L	13.35	50	Max 30		APHA 5210 B Method	
	COD (Cr)	mg/L	29.9	250	Max 125		APHA 5220D Method	
	Total Coliform*4	MPN/100 ml	35000	400	Max 400		APHA 9221B Method	
	Total Nitrogen (T-N)	mg/L	< 0.5	-	Max 80		HACH Method 10072 Method	
	Total Phosphorous (T-P)	mg/L	0.22	2	Max 2		APHA 4500-P E Method	

Location	Item	Unit	Measured Value (Max)	Country's Standard*2	Target value to be applied*1	Frequ-ency	Method	Note (Reason of excess of the standard)
SW-4 (Reference point) Sampling on 6 June 2024	Color	TCU	61.13	-	Max 150		APHA 2120C Method	Refer to water quality report
	Odor	TON	1	-	-		APHA 2150 B Method	
	Oil and Grease	mg/L	< 3.1	10	Max 10		APHA 5520B Method	
	Mercury	mg/L	≤ 0.002	0.01	Max 0.005		APHA 3120 B Method	
	Zinc	mg/L	≤ 0.002	2	Max 2		APHA 3120 B Method	
	Arsenic	mg/L	≤ 0.010	0.1	Max 0.1		APHA 3120 B Method	
	Chromium	mg/L	≤ 0.002	0.5	Max 0.5		APHA 3120 B Method	
	Cadmium	mg/L	≤ 0.002	0.1	Max 0.03		APHA 3120 B Method	
	Selenium	mg/L	≤ 0.010	0.1	Max 0.02		APHA 3120 B Method	
	Lead	mg/L	≤ 0.002	0.1	Max 0.1		APHA 3120 B Method	
	Copper	mg/L	≤ 0.002	0.5	Max 0.5		APHA 3120 B Method	
	Barium	mg/L	0.022	-	Max 1		APHA 3120 B Method	
	Nickel	mg/L	≤ 0.002	0.5	Max 0.2		APHA 3120 B Method	
	Cyanide	mg/L	< 0.002	0.1	Max 0.1		HACH 8027 Method	
	Total Cyanide	mg/L	0.002	1	Max 1		APHA 4500-CN-C Method	
	Free Chlorine	mg/L	< 0.1	-	Max 1		APHA 4500-CL G Method	
	Sulphide (S_2 -)	mg/L	0.077	1	Max 1		HACH 8131 Method	
	Formaldehyde	mg/L	0.069	-	Max 1		HACH 8110 Method	
	Phenols	mg/L	0.018	0.5	Max 0.5		USEPA Method 420.1	
	Iron*5	mg/L	4.132	3.5	Max 3.5		APHA 3120 B Method	
	Total Dissolved Solids	mg/L	124	-	Max 2000		APHA 2540 C Method	
	Total Residual Chlorine	mg/L	0.1	0.2	Max 0.2		APHA 4500-CL G Method	
	Chromium (Hexavalent)	mg/L	< 0.05	0.1	Max 0.1		ISO 11083:1994 Method	
	Ammonia	mg/L	0.05	10	Max 10		HACH Method 10205 Method	
	Fluoride	mg/L	0.039	20	Max 20		APHA 4110 B Method	
	Silver	mg/L	≤ 0.002	0.5	Max 0.5		APHA 3120 B Method	
SW-7 (Discharged point) Sampling on 6 June 2024	Temperature	℃	29	< 3 (increase)	≤ 35	Once per 6 months	Instrument Analysis Method	Refer to water quality report
	pH	-	6.5	6-9	6~9		Instrument Analysis Method	
	Suspended Solids (SS)*6	mg/L	126	50	Max 50		APHA 2540 D Method	
	Dissolved Oxygen (DO)	mg/L	3.23	-	-		Instrument Analysis Method	
	BOD (5)	mg/L	8.19	50	Max 30		APHA 5210 B Method	
	COD (Cr)	mg/L	19.5	250	Max 125		APHA 5220D Method	
	Total Coliform*7	MPN/100 ml	> 160000	400	Max 400		APHA 9221B Method	

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Location	Item	Unit	Measured Value (Max)	Country's Standard*2	Target value to be applied*1	Frequ-ency	Method	Note (Reason of excess of the standard)
SW-7 (Discharged point) Sampling on 6 June 2024	Total Nitrogen (T-N)	mg/L	< 0.5	-	Max 80		HACH Method 10072 Method	Refer to water quality report
	Total Phosphorous (T-P)	mg/L	0.29	2	Max 2		APHA 4500-P E Method	
	Color	TCU	18.63	-	Max 150		APHA 2120C Method	
	Odor	TON	1	-	-		APHA 2150 B Method	
	Oil and Grease	mg/L	< 3.1	10	Max 10		APHA 5520B Method	
	Mercury	mg/L	≤ 0.002	0.01	Max 0.005		APHA 3120 B Method	
	Zinc	mg/L	≤ 0.002	2	Max 2		APHA 3120 B Method	
	Arsenic	mg/L	≤ 0.010	0.1	Max 0.1		APHA 3120 B Method	
	Chromium	mg/L	≤ 0.002	0.5	Max 0.5		APHA 3120 B Method	
	Cadmium	mg/L	≤ 0.002	0.1	Max 0.03		APHA 3120 B Method	
	Selenium	mg/L	≤ 0.010	0.1	Max 0.02		APHA 3120 B Method	
	Lead	mg/L	≤ 0.002	0.1	Max 0.1		APHA 3120 B Method	
	Copper	mg/L	≤ 0.002	0.5	Max 0.5		APHA 3120 B Method	
	Barium	mg/L	0.032	-	Max 1		APHA 3120 B Method	
	Nickel	mg/L	≤ 0.002	0.5	Max 0.2		APHA 3120 B Method	
	Cyanide	mg/L	< 0.002	0.1	Max 0.1		HACH 8027 Method	
	Total Cyanide	mg/L	0.002	1	Max 1		APHA 4500-CN-C Method	
	Free Chlorine	mg/L	< 0.1	-	Max 1		APHA 4500-CL G Method	
	Sulphide (S_2 -)	mg/L	0.281	1	Max 1		HACH 8131 Method	
	Formaldehyde	mg/L	0.188	-	Max 1		HACH 8110 Method	
	Phenols	mg/L	< 0.002	0.5	Max 0.5		USEPA Method 420.1	
	Iron*8	mg/L	5.720	3.5	Max 3.5		APHA 3120 B Method	
	Total Dissolved Solids	mg/L	172	-	Max 2000		APHA 2540 C Method	
	Total Residual Chlorine	mg/L	0.1	0.2	Max 0.2		APHA 4500-CL G Method	
	Chromium (Hexavalent)	mg/L	< 0.05	0.1	Max 0.1		ISO 11083:1994 Method	
	Ammonia	mg/L	0.15	10	Max 10		HACH Method 10205 Method	
	Fluoride	mg/L	0.064	20	Max 20		APHA 4110 B Method	
	Silver	mg/L	≤ 0.002	0.5	Max 0.5		APHA 3120 B Method	
SW-8 (Discharged point)	Temperature	˚C	29	< 3 (increase)	≤ 35	Once per 6 months	Instrument Analysis Method	
	pH	-	6.7	6-9	6~9		Instrument Analysis Method	
	Suspended Solids (SS)	mg/L	30	50	Max 50		APHA 2540 D Method	
	Dissolved Oxygen (DO)	mg/L	3.32	-	-		Instrument Analysis Method	
	BOD (5)	mg/L	4.13	50	Max 30		APHA 5210 B Method	
	COD (Cr)	mg/L	12.4	250	Max 125		APHA 5220D Method	

Location	Item	Unit	Measured Value (Max)	Country's Standard*2	Target value to be applied*1	Frequency	Method	Note (Reason of excess of the standard)
SW-8 (Discharged point) Sampling on 6 June 2024	Total Coliform*7	MPN/100 ml	92000	400	Max 400		APHA 9221B Method	Refer to water quality report
	Total Nitrogen (T-N)	mg/L	< 0.5	-	Max 80		HACH Method 10072 Method	
	Total Phosphorous (T-P)	mg/L	0.10	2	Max 2		APHA 4500-P E Method	
	Color	TCU	13.63	-	Max 150		APHA 2120C Method	
	Odor	TON	1	-	-		APHA 2150 B Method	
	Oil and Grease	mg/L	< 3.1	10	Max 10		APHA 5520B Method	
	Mercury	mg/L	≤ 0.002	0.01	Max 0.005		APHA 3120 B Method	
	Zinc	mg/L	≤ 0.002	2	Max 2		APHA 3120 B Method	
	Arsenic	mg/L	≤ 0.010	0.1	Max 0.1		APHA 3120 B Method	
	Chromium	mg/L	≤ 0.002	0.5	Max 0.5		APHA 3120 B Method	
	Cadmium	mg/L	≤ 0.002	0.1	Max 0.03		APHA 3120 B Method	
	Selenium	mg/L	≤ 0.010	0.1	Max 0.02		APHA 3120 B Method	
	Lead	mg/L	≤ 0.002	0.1	Max 0.1		APHA 3120 B Method	
	Copper	mg/L	≤ 0.002	0.5	Max 0.5		APHA 3120 B Method	
	Barium	mg/L	0.014	-	Max 1		APHA 3120 B Method	
	Nickel	mg/L	≤ 0.002	0.5	Max 0.2		APHA 3120 B Method	
	Cyanide	mg/L	< 0.002	0.1	Max 0.1		HACH 8027 Method	
	Total Cyanide	mg/L	0.002	1	Max 1		APHA 4500-CN-C Method	
	Free Chlorine	mg/L	< 0.1	-	Max 1		APHA 4500-CL G Method	
	Sulphide (S_2 -)	mg/L	0.113	1	Max 1		HACH 8131 Method	
	Formaldehyde	mg/L	0.080	-	Max 1		HACH 8110 Method	
	Phenols	mg/L	0.007	0.5	Max 0.5		USEPA Method 420.1	
	Iron	mg/L	1.956	3.5	Max 3.5		APHA 3120 B Method	
	Total Dissolved Solids	mg/L	150	-	Max 2000		APHA 2540 C Method	
	Total Residual Chlorine	mg/L	0.1	0.2	Max 0.2		APHA 4500-CL G Method	
	Chromium (Hexavalent)	mg/L	< 0.05	0.1	Max 0.1		ISO 11083:1994 Method	
	Ammonia	mg/L	0.06	10	Max 10		HACH Method 10205 Method	
	Fluoride	mg/L	0.095	20	Max 20		APHA 4110 B Method	
	Silver	mg/L	≤ 0.002	0.5	Max 0.5		APHA 3120 B Method	
	Temperature	˚C	29	< 3 (increase)	≤ 35	Once per 6 months	Instrument Analysis Method	
	pH	-	6.6	6-9	6~9		Instrument Analysis Method	
	Suspended Solids (SS)	mg/L	20	50	Max 50		APHA 2540 D Method	
	Dissolved Oxygen (DO)	mg/L	8.41	-	-		Instrument Analysis Method	

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Location	Item	Unit	Measured Value (Max)	Country's Standard*2	Target value to be applied*1	Frequ-ency	Method	Note (Reason of excess of the standard)
GW-2 (Reference point) Sampling on 6 June 2024	BOD (5)	mg/L	25.31	50	Max 30		APHA 5210 B Method	
	COD (Cr)	mg/L	55.6	250	Max 125		APHA 5220D Method	
	Total Coliform*9	MPN/100 ml	21	400	Max 400		APHA 9221B Method	
	Total Nitrogen (T-N)	mg/L	< 0.5	-	Max 80		HACH Method 10072 Method	
	Total Phosphorous (T-P)	mg/L	0.64	2	Max 2		APHA 4500-P E Method	
	Color	TCU	57.38	-	Max 150		APHA 2120C Method	
	Odor	TON	1	-	-		APHA 2150 B Method	
	Oil and Grease	mg/L	< 3.1	10	Max 10		APHA 5520B Method	
	Mercury	mg/L	≤ 0.002	0.01	Max 0.005		APHA 3120 B Method	
	Zinc	mg/L	≤ 0.002	2	Max 2		APHA 3120 B Method	Refer to water quality report
	Arsenic	mg/L	≤ 0.010	0.1	Max 0.1		APHA 3120 B Method	
	Chromium	mg/L	≤ 0.002	0.5	Max 0.5		APHA 3120 B Method	
	Cadmium	mg/L	≤ 0.002	0.1	Max 0.03		APHA 3120 B Method	
	Selenium	mg/L	≤ 0.010	0.1	Max 0.02		APHA 3120 B Method	
	Lead	mg/L	≤ 0.002	0.1	Max 0.1		APHA 3120 B Method	
	Copper	mg/L	≤ 0.002	0.5	Max 0.5		APHA 3120 B Method	
	Barium	mg/L	0.014	-	Max 1		APHA 3120 B Method	
	Nickel	mg/L	≤ 0.002	0.5	Max 0.2		APHA 3120 B Method	
	Cyanide	mg/L	< 0.002	0.1	Max 0.1		HACH 8027 Method	
	Total Cyanide	mg/L	0.002	1	Max 1		APHA 4500-CN-C Method	
	Free Chlorine	mg/L	< 0.1	-	Max 1		APHA 4500-CL G Method	
	Sulphide (S_2 -)	mg/L	0.012	1	Max 1		HACH 8131 Method	
	Formaldehyde	mg/L	0.048	-	Max 1		HACH 8110 Method	
	Phenols*11	mg/L	0.012	0.5	Max 0.5		USEPA Method 420.1	
	Iron*10	mg/L	5.420	3.5	Max 3.5		APHA 3120 B Method	
	Total Dissolved Solids	mg/L	198	-	Max 2000		APHA 2540 C Method	
	Total Residual Chlorine	mg/L	< 0.1	0.2	Max 0.2		APHA 4500-CL G Method	
	Chromium (Hexavalent)	mg/L	< 0.05	0.1	Max 0.1		ISO 11083:1994 Method	
	Ammonia	mg/L	< 0.02	10	Max 10		HACH Method 10205 Method	Refer to water quality report
	Fluoride	mg/L	0.110	20	Max 20		APHA 4110 B Method	
	Silver	mg/L	≤ 0.002	0.5	Max 0.5		APHA 3120 B Method	

*1Remark: Reference to the Water and Wastewater Quality Monitoring Report (June 2024)

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

*3Remark: In the monitoring point of SW-4 SS exceeded than the target value due to expected i) delivered from upstream area such as natural origin and wastewater from local industrial zone which is located outside of Thilawa SEZ, and ii) influence by water from the downstream of monitoring points due to backflow by tidal fluctuation along Shwe Pyauk creek.

*4Remark: For the monitoring point of SW2, SW4 the result of total coliform exceeded than the target value due to expected reasons i) the existing of various kinds of vegetation and aquatic animals, especially fecal contamination from the animals, ii) contaminants from the surroundings into the Shwe Pyauk creek may contain fecal matter and other pollutants, leading to increase coliform levels and iii) incoming tidal water can contain the fecal matter and delivered along Shwe Pyauk creek during flood tide.

*5Remark: For the monitoring point of SW-4, the result of iron exceeded due to expected reason i) due to the influence of natural origin (iron can reach out from the soil by run-off). Surroundings of the Thilawa SEZ especially small hilly areas are mainly composed of iron rich soil (lateritic soil), and it can be transported to the low land area by run-off or strong wind.

*6 Remark: For the monitoring point of SW-7, the results of SS exceeded due to the expected reason i) the surface water run-off from bare land in Zone B.

*7 Remark: For the monitoring point of SW-7 and SW-8, the results of Total Coliform exceeded due to the expected reason that might be natural bacteria existed in all area of Zone B because the existing of various kinds of vegetation and aquatic animals, especially fecal contamination from the animals, and the contaminants from the surroundings into the retention pond may contain fecal matter and other pollutants, leading to increase coliform levels. Total coliforms do not affect human health directly, self-monitoring was carried out to identify health impact by coliform bacteria. As for the result of E-Coli SW-7 was 12 and SW-8 was 2. It is considered that there is no significant impact to human health.

*8 Remark: For the monitoring point of SW-7, Iron exceeded may be due to the influence of natural origin (iron can reach out from soil by run-off). Surroundings of the Thilawa SEZ especially small hilly areas are mainly composed of iron rich soil (lateritic soil), and it can be transported to the low land area by strong wind. Moreover, iron remains in the natural environment for a long time.

*9 Remark: For the monitoring point of GW-2, T-Coli exceeded than the Vietnam Ground water standard (3 mg/L) expected reason due to the poor maintenance of well which can increase the risk of bacteria and other harmful organisms. (The results of T-Coli at GW-2 was within the limitation in the EIA report of Thilawa SEZ). However, the result of E. Coli of (GW-2 < 1.8) was within the limitation. Therefore, although the limitation of total coliform exceeded than Vietnam Standard at monitoring point of (GW-2), it is considered that there is no significant impact on human health.

*10 Remark: For the monitoring point of reference tube well (GW-2), iron result exceeded than the target value may be due to expected reason i) the influence of natural origin

(iron can reach out from soil by run-off). Moreover, Thilawa SEZ area is mainly composed of iron rich soil (lateritic soil), and it can be saturated in the underlying confined aquifer.

*11 Remark: For the monitoring point of reference tube well (GW-2), Phenol is exceeded than Vietnam Ground water standard (0.001mg/L). However, phenols result was within the limitation prescribed in the EIA report of Thilawa SEZ. It may be due to the phenolic pollutants in the surrounding soil layer resulting from the remnants of coal tar, pesticides, fertilizers and other organic compound, can be dissolved into the groundwater aquifer.

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

Remark: Soil contamination survey will be done after the whole Zone-B is operation stage.

4) Noise Level (June 2024)

Location	Item	Unit	Measured Value (Mean)	Measured Value (Max)	Country's Standard	Target value to be applied*	Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
Residential Area NV-2 (4 June 2024)	Leq (day)	dB(A)	55	55	Refer to NEQG Article 1.3	60	Refer the section 2.4 in EIA main report	One time / 3 months		
	Leq (evening)	dB(A)	-	-		55				
	Leq(night)	dB(A)	-	-		50				
Along the road (NV-1) (4 June 2024)	Leq (day)	dB(A)	61	62		75				
	Leq(night)	dB(A)	-	-		70				

***Remarks:** Referred to the tentative target value of ambient air quality (EIA Report for industrial area, Table 2.4-8), Reference to the noise and vibration monitoring report (June 2024)

Remark: Due to has Curfew and we could monitor day time only.

Complaints from Residents

- Are there any complaints from residents regarding noise in this monitoring period? ☐ Yes, ☑ No

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

Contents of Complaints from Residents	Countermeasures

5) Solid Waste

Measurement Point: Storage for Sludge* (Operation Phase)

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

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

Item	Date	Generated from	Unit	Value	Disposed to
General Waste	6 March 2024	Landscaping and Plantation	Kg	2950	Waste disposing to Than Lynn Development Committee, Yangon Division
	10 April 2024			2900	
	3 May 2024			2850	
	31 May 2024			2800	
	1 July 2024			2950	
	7 August 2024			2850	
Total			Kg	17,300	
Sludge	10 April 2024	Sewage Treatment Plant	Kg	5420	Golden DOWA Eco- System Myanmar Co., Ltd
	9 May 2024		Kg	5400	
	16 July 2024		Kg	6120	
Total			Kg	16940	

Remarks: Waste amount is not only in TSEZ-B but also combine with TSEZ-A General Waste. Generate wastes are dried waste and weight value are estimated base on type of Trash collector car. Green Waste are used in Bio-fertilizer.

Note: Zone-B wastewater treated at Sewage Treatment of TSEZ-A. Above data are sludge generated from Sewage treatment plant of TSEZ-A.

6) (a) Ground Subsidence Hydrology (GPS Location 16.67 N, 96.29E)

Duration (Month)	Water Consumption		Ground Level		Note
	Quantity	Unit	Quantity	Unit	
20 April -2024			+6.300	m	There is no tube well water consumption and Ground level monitor once per month

6) (b) Ground Subsidence Hydrology (GPS Location 16.67 N, 96.29E)

Duration (Month)	Water Consumption		Ground Level		Note
	Quantity	Unit	Quantity	Unit	
24 May -2024			+6.300	m	There is no tube well water consumption and Ground level monitor once per month

6) (c) Ground Subsidence Hydrology (GPS Location 16.67 N, 96.29E)

Duration (Month)	Water Consumption		Ground Level		Note
	Quantity	Unit	Quantity	Unit	
22 June -2024			+6.302	m	There is no tube well water consumption and Ground level monitor once per month

6) (d) Ground Subsidence Hydrology (GPS Location 16.67 N, 96.29E)

Duration (Month)	Water Consumption		Ground Level		Note
	Quantity	Unit	Quantity	Unit	
26 July -2024			+6.301	m	There is no tube well water consumption and Ground level monitor once per month

6) (e) Ground Subsidence Hydrology (GPS Location 16.67 N, 96.29E)

Duration (Month)	Water Consumption		Ground Level		Note
	Quantity	Unit	Quantity	Unit	
23 August -2024			+6.301	m	There is no tube well water consumption and Ground level monitor once per month

6) (f) Ground Subsidence Hydrology (GPS Location 16.67 N, 96.29E)

Duration (Month)	Water Consumption		Ground Level		Note
	Quantity	Unit	Quantity	Unit	

28 September -2024			+6.341	m	There is no tube well water consumption and Ground level monitor once per month

7) Offensive Odor (only operation phase)

Complaints from Residents

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

Contents of Complaints from Residents	Countermeasures

Situations environmental report from tenants

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

Contents of Complaints from Tenants	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
There is no accident and incident during monitoring period.	

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

Myanmar Japan Thilawa Development Limited MJTD

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

Information from TSMC

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

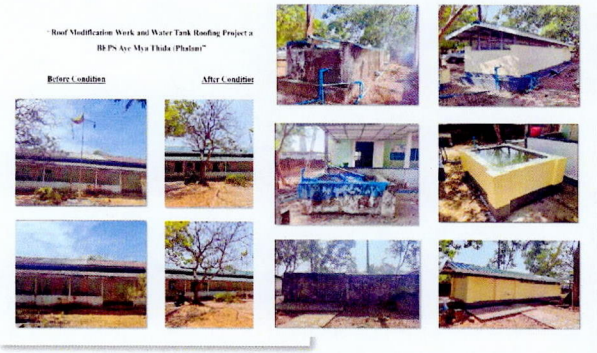
Resentment Works		Progress in Narrative	Remarkable Issues
Projected Affected Persons	Land Acquisition and Relocation	There were no compensated or relocated PAHs between March 2024 to August 2024, as there was no progress in land acquisition and relocation work during this period.	
	Income Restoration Program	From March 2024 to August 2024, there are no specific activities except some requests from PAPs to the IRP team.	
Common Assets	Relocation		

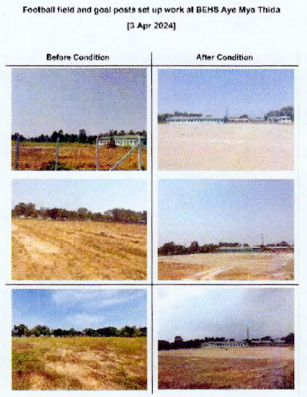
- Are there any grievances submitted, solved and pending regarding resettlement works? ☐ Yes, ☑ No
  If yes, please describe the contents of grievances to fill in below the table.

Contents of Grievance	Response/ Countermeasures

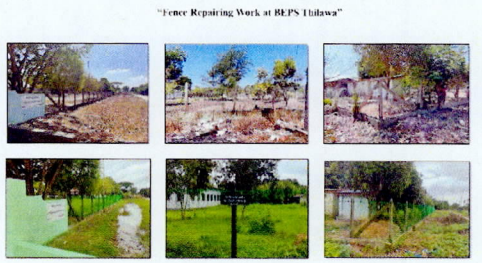
10) CSR activities such as Community Support Program
- Are there any CSR activities implemented in this monitoring period? ☑ Yes, ☐ No

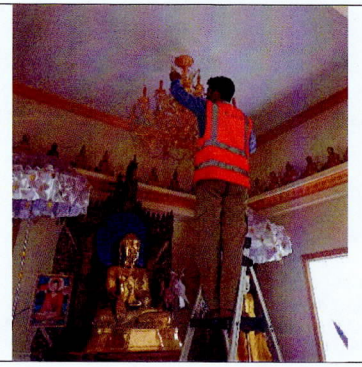
If yes, please describe the outline of CSR activities implemented to fill in below the table.

Date	Activities	Description (Location, Participant etc)	Available photos
March 2024	Covid 19 Vaccination Program	COVID-19 Booster Vaccination for TSEZ Locators was done on 7 March and provided booster vaccine to 504 employees from locators of Thilawa SEZ	
March 2024	School Sport Facilities – Football Field and Goal Posts	Provided Football field and Installation of Goal Posts at BEHS Aye Mya Thida (First Payment 40% of the total cost)	-
March 2024	Roof Modification Work at School Building and Water Tank	Roofing School Roof Modification Work at School Building and Water Tank Roofing at BEPS Phalan	
March 2024	Meeting with TSEZ scholarship students (Academic year 2023-2024)	The evaluation meeting was done on March 2024 with the scholarship students of TSEZ (for the 2023-2024	

		academic year) in order to share and evaluate the effectiveness of the educational support to students from TSEZ neighboring communities.	
April 2024	Renovation and Repair Education Facilities for a safe learning environment (School Sports Facilities - Soccer Field and Goal Posts)	Provide Ground Leveling for playground field and Installation of Goal Posts for School Football teams to promote physical activity of community children around PACs (BEHS Aye Mya Thida) (Final Payment 60%)	
	Handover and Opening Ceremony of School Football Field	Handover and Opening Ceremony of the football field and a friendly match between Aye Mya Thida Ward and Shwe Pyi Thar Yar Ward was done on April at BEHS (BR) Aye Mya Thida Ward.	

April 2024	Thilawa SEZ CSR Engagement Meeting	Meeting with TSEZ Locators CSR representatives for reporting the previous CSR Activities during FY2023-2024 and discussing for activities in FY2024-2025	
April 2024	Scholarship/Student Grant Program for outstanding student in TSEZ (University Medical Student)	Provide academic support (150,000/-MMK per month) for Medical Year-2 Student from Shwe Pyauk Village (Mg Zaw Htet (Apr 2024 to Sep 2024)	
April 2024	Cash Assistance Program (Homage Paying Ceremony) of elder persons (80 years and above) around TSEZ	Provide 150,000/-MMK for each elder person 80-years and above in TSEZ neighboring communities, Total – of 120 elders (Ah Lwan Suk, Aye Mya Thida, Shwe Pyi Thar Yar, Thida Myaing, and Shwe Pyauk)	

June 2024	Renovation and Repair Education Facilities for Safe Learning Environment: Fence Repair Work at BEPS Thilawa	The existing fence is seriously damaged and unsafe for primary students. To support a safe learning environment for community children, with the cooperation of the construction team.	
June 2024	Skill Development Program: Arts and Drawing Class for primary students (G3, G4, G5)	Provided Basic Arts and Drawing Class (2 months course) for primary students (80 students) from BEPS Thilawa, BEPS Kone Tan, and BEPS Tat Yar Kone, Shwe Pyi Thar Yar Ward. Aimed at fostering creativity and artistic skills among young students.	
June 2024	Workshop on "Raising Awareness about Sustainable Environment at TSEZ"	This one-day workshop conducted on 19 June 2024 with collaboration between the MJTD Environment Section and support from the OSSC Environmental Conservation Department. 70 attendees representing 37 locators attended the workshop and shared their perspective on sustainability and environmental friendliness in their daily operation.	

June 2024	Repair Work for Dhamma Hall at Moekyo Swan Monastery	Repairs/ Maintenance work for TSEZ provided infrastructure.	
July 2024	Environmental Awareness Talks at School	To educate and encourage young people about the importance of nature and the environment, with the collaboration of Environmental Conservation Department (ECD) of Yangon Southern District and School committee. 180 students from Grades 10, 11 and 12 attended.	

July 2024	Tree Plantation Activity at BEHS Aye Mya Thida	Provide a total of 659 plants, comprising 7 large plants (including Cedrela Febrifuga, Star Flower, Terminalia Mantaly, and Golden Shower) and 652 small plants (such as Pinwheel Flower, Flame of the Woods, Yellow Bell, and others), with the support of MJTD Landscaping Team.	
July 2024	TSEZ Scholarship/Student Grant Program for outstanding students in TSEZ (High School Students)	Provide the scholarship payment for High School Students, G12 - 12 students, G11-4 students, and G10- 4 students (Total 20 students) from BEHS Aye Mya Thida, BEHS Myaing Thar Yar (June 2024 – September 2024)	

July 2024	Academic Fund for Students around TSEZ for equitable access to quality educational opportunities	Provided academic funds 2,000,000 for students at two high schools: BEHS Myaing Thar Yar and BEHS Aye Mya Thida	
July 2024	Maintenance for TSEZ Donated Bus Stops along Dagon Thilawa Road.	Payment for Bus Stop (Bus-Shutters) Installation Project alongside of Zone A, Dagon Thilawa Road, Thanlyin and Kyauk Tan Township (Total 4 numbers) (Final Payment 10% after the completion of DLP period)	
August 2024	Skill Development Program: Arts and Drawing Class for primary students (G3, G4, G5)	Closing and Awarding Ceremony of Arts and Drawing Class for primary students (G3, G4 and G5) at BEPS Thilawa, BEPS Tat Yar Kone and BEPS Kone Tan. A total (79) students completed the course. Also provided the first, second, and third prizes top scorer in the completion exam.	

August 2024	School Items Donation (Stationary Donation) to students around TSEZ communities	9th TSEZ Stationery Donation Program: distributed stationery items to students around PACs and its covered over 4640 students from seven villages and wards surrounding the Thilawa SEZ. (Annual Support Program)	
Mar 2024 to Aug 2024	Electricity Utility Charges Support to Moe Kyo Swam Monastery	Provided the monthly electricity utility charges for the neighboring monastery- Moe Kyo Swan Monastery at TSEZ Shwe Pyi Thar Yar Ward.	-
March 2024 to Aug 2024	Job assistance for vacancy announcement	The vacancy announcement from Locators (about 72 posts) was delivered and uploaded to the TSEZ Facebook page.	-

End of Document

Thilawa Special Economic Zone

Zone B– Phase 1,2 & 3 (Operation phase)

Appendix-A

Water and Waste Water Monitoring Report

February 2024

WATER QUALITY MONITORING REPORT

FOR DEVELOPMENT OF INDUSTRIAL AREA

IN THILAWA SEZ ZONE B

(PHASE 1, 2 & 3 OPERATION STAGE)

(Bi-Monthly Monitoring)

February 2024

Myanmar Koei International Ltd.

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CHAPTER 1: INTRODUCTION

1.1 General

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

Source: Google Earth

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

CHAPTER 2: WATER QUALITY MONITORING

2.1 Monitoring Items

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

Water quality sampling was carried out at four locations. Among the four locations, water flow measurement at one location (SW-4) can be carried out by current meter. However, water flow measurement cannot be conducted with current meter at two locations (SW-2 and SW-7) because no water flow was at SW-2 and water gate at SW-7 was closed during sampling. Monitoring items and sampling points are summarized in Table 2.1-1.

Table 2.1-1 Monitoring Items for Water Quality

No.	Parameters	SW-2	SW-4	SW-7	GW-2	Remarks
1	Water Temperature	○	○	○	○	On-site measurement
2	pH	○	○	○	○	On-site measurement
3	Dissolved Oxygen (DO)	○	○	○	○	On-site measurement
4	Suspended Solid (SS)	○	○	○	○	Laboratory analysis
5	$BOD_{(5)}$	○	○	○	○	Laboratory analysis
6	$COD_{(Cr)}$	○	○	○	○	Laboratory analysis
7	Color	○	○	○	○	Laboratory analysis
8	Odor	○	○	○	○	Laboratory analysis
9	Oil and Grease	○	○	○	○	Laboratory analysis
10	Total Nitrogen (T-N)	○	○	○	○	Laboratory analysis
11	Total Phosphorus (T-P)	○	○	○	○	Laboratory analysis
12	Total Coliform	○	○	○	○	Laboratory analysis
13	Total Dissolved solids (TDS) (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-2	**Coordinate**- N - 16° 40' 20.69", E - 96° 17' 18.04"
		Location - Upstream of Shwe Pyauk Creek
		Survey Item - Surface water sampling
2	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
3	SW-7	**Coordinate** - N - 16° 40' 13.25", E - 96° 17' 5.66"
		Location – Outlet of retention pond of Zone B before connecting to Shwe Pyauk Creek
		Survey Item - Discharge water sampling
4	GW-2	**Coordinate** - N - 16° 39' 25.30", E - 96° 17' 15.60"
		Location - In the monastery compound of Phalan village
		Survey Item - Ground water sampling

Source: Myanmar Koei International Ltd.

SW-2 (Reference Point)

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

SW-7 (Discharged Point)

SW-7 is main discharged point of Zone B during operation stage. The distance is about 434 m downstream of SW-2. This sampling point is located at outlet of retention pond of Zone B, in the north of Zone B area and in the south of Dagon-Thilawa road. The surrounding areas are Zone A in the north and local industrial zone in the east respectively.

GW-2 (Reference of Existing Tube Well)

GW-2 was collected from tube well as ground water sample. It is located in the monastery compound of Phalan village. The surrounding areas are Thilawa SEZ Zone A in the north, Phalan village in the south and fields in the west and local industrial zone in the northeast and operation of Thilawa SEZ Zone B in the east and northeast 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 measured by using the on-site instrument "JFE 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	Suspended Solid (SS)	APHA 2540D (Dry at 103-105°C Method)
5	$BOD_{(5)}$	APHA 5210 B (5 days BOD Test)
6	$COD_{(Cr)}$	APHA 5220D (Close Reflux Colorimetric Method)
7	Color	APHA 2120C (Spectrophotometric Method)
8	Odor	APHA 2150 B (Threshold Odor Test)
9	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)
10	Total Nitrogen (T-N)	HACH Method 10072 (TNT Persulfate Digestion Method)
11	Total Phosphorous (T-P)	APHA 4500-P E (Ascorbic Acid Method)
12	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)
13	Total Dissolved Solids (TDS)	APHA 2540C (Total Dissolved Solids Dried at 180°C Method)
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 AEM 213-D Digital Current Meters)

Source: Myanmar Koei International Ltd.

2.4 Monitoring Period

Water quality and water flow rate monitoring were conducted on 6 February 2024, and sampling time is shown in Table 2.4-1 to avoid tidal effect. The tide record for Yangon River, Myanmar 6 February 2024 is shown in Table 2.4-2.

Table 2.4-1 Sampling Time of Each Point

No.	Station	Sampling Time
1	SW-2	06/02/2024 09:12
2	SW-4	06/02/2024 13:09
3	SW-7	06/02/2024 09:43
4	GW-2	06/02/2024 08:52

Source: Myanmar Koei International Ltd.

Table 2.4-2 Tide Record for Yangon River, Myanmar

Date	Time	Height (m)	Tide Conditions
06/02/2024	00:53	4.31	High Tide
	08:39	0.92	Low Tide
	14:09	3.92	High Tide
	20:39	1.32	Low Tide

Source: Myanmar Port Authority, Tide Table for the Yangon River and Elephant Point, 2024.

2.5 Monitoring Results

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

2.5.1 Results of Discharged Point and Discharged Creek

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

Result of Discharged point

As for the result of total coliform of surface water, result at the main discharging point of Zone B (SW-7) before discharging to the creek, exceeded the target value due to the expected reason; the potential expected reason might be natural bacteria existed in all area of Zone B because the existing of various kinds of vegetation and aquatic animals, especially fecal contamination from the animals, and the contaminants from the surroundings into the retention pond may contain fecal matter and other pollutants, leading to increase coliform levels.

Since the composition of the total coliform include bacteria from natural origin, and total coliform do not affect human health directly, E. Coli analysis was carried out alternatively to identify the health impact by coliform bacteria. As for the result of E. Coli of surface water at the main discharging point of Zone B (SW-7), the result was under the reference value. Therefore, although the target value of total coliform was exceeded at the main discharging point of Zone B (SW-7) but it is considered that there is no significant impact on human health.

As for the result of iron, the result at the main discharging point of Zone B (SW-7) before discharging to the creek exceeded the target value. The possible reasons may be due to the influence of natural origin (iron can reach out from soil by run-off). Surroundings of the Thilawa SEZ especially small hilly areas are mainly composed of iron rich soil (lateritic soil), and it can be transported to the low land area by strong wind. Moreover, iron remains in the natural environment for a long time. Table 2.5-1 shows the results of water quality of the main discharged point of Zone B (SW-7) and reference monitoring points (SW-2 and SW-4). Regarding SW-2 and SW-4, SS concentration are 20 mg/l and 528 mg/l, while iron concentration occur 1.164 mg/l and 24.000 mg/l respectively. It can be clearly seen that the lower suspended solid concentrations generally have lower iron concentrations and higher suspended solid concentrations generally have higher iron concentrations.

Result of Reference Monitoring points (Discharged Creek)

As for the result of SS, results at the surface water monitoring point (SW-4) exceeded the target values. The exceeded result for SS maybe due to two expected reasons; i) delivered from upstream area such as natural origin and wastewater from local industrial zone which is located outside of Thilawa SEZ, and ii) influence by water from the downstream of monitoring points due to backflow by tidal fluctuation along Shwe Pyauk creek.

As for the result of total coliform, results at surface water monitoring points (SW-2) and (SW-4) exceeded the target value due to three expected reasons: i) the existing of various kinds of vegetation and aquatic animals, especially fecal contamination from the animals, ii) contaminants from the surroundings into the Shwe Pyauk creek may contain fecal matter and other pollutants, leading to increase coliform levels and iii) incoming tidal water can contain the fecal matter and delivered along Shwe Pyauk creek during flood tide.

As for the result of iron, the result at the monitoring point of surface water monitoring points (SW-4) exceeded the target value. The possible reason for exceeded value in surface water (SW-4) maybe due to the influence of natural origin (iron can reach out from the soil by run-off). Surroundings of the Thilawa SEZ especially small hilly areas are mainly composed of iron rich soil (lateritic soil), and it can be transported to the low land area by run-off or strong wind.

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

No.	Parameters	Unit	SW-2	SW-4	SW-7	Target Value (Reference Value for Self-Monitoring)
1	Water Temperature	°C	22	26	23	≤ 35
2	pH	-	6.8	8.0	7.1	6~9
3	Dissolved Oxygen (DO)	mg/l	3.88	5.22	5.08	-
4	Suspended Solid (SS)	mg/l	20	528	36	50
5	$BOD_{(5)}$	mg/l	11.63	3.50	6.61	30
6	$COD_{(Cr)}$	mg/l	36.8	11.7	17.3	125
7	Color	TCU (True Color Unit)	18.43	11.29	8.30	150
8	Odor	TON (Threshold Odor Number)	1	1	1.4	-
9	Oil and Grease	mg/l	< 3.1	< 3.1	< 3.1	10
10	Total Nitrogen (T-N)	mg/l	2.8	7.1	3.2	80
11	Total Phosphorus (T-P)	mg/l	0.21	1.05	0.20	2
12	Total Coliform	MPN/100ml	> 160000	> 160000	1400.0	400
13	Total Dissolved solids (TDS)	mg/l	1932	604	386	2000
14	Iron	mg/l	1.164	24.000	3.536	3.5
15	Mercury	mg/l	≤ 0.002	≤ 0.002	≤ 0.002	0.005
16	Escherichia Coli	MPN/100ml	-	-	4.5	(1000)* (CFU/100ml)
17	Flow Rate	m^3/s	-	0.49	-	-

Note: Red color means exceeded value than target value.

*Note: Based on the water utilization at discharged creek, the 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 Result of Reference Tube Well

Result of water quality monitoring at reference tube well monitoring point is shown in Table 2.5-2. As the comparison with the target value, the result of total coliform and iron exceeded the target value.

For the ground water quality, National Technical Regulation on Ground Water Quality (No. QCVN 09-MT: 2015/BTNMT) in Vietnam are used as a reference because Myanmar does not have any ground water guidelines and standards, and most of the analyzed parameter are included in Vietnam standard rather the those stipulated by neighboring countries. For the result of Escherichia Coli, B1 (Irrigation water) of National Technical Regulation on Surface Water Quality (No. QCVN 08-MT: 2015/BTNMT) in Vietnam is referred, as no standard for E.coli is mentioned in Vietnam ground water regulation.as a reference.

As for the result of total coliform in ground water, results at (GW-2) exceeded the target value. It may be possible due to the poor maintenance of well which can increase the risk of bacteria and other harmful organisms. According to the information by monastery, the depth of tube well (GW-2) is about 30 m. By referring the report "Data Collection Survey on Water Resources Potential for Thilawa SEZ and Adjoining Areas" prepared by JICA in 2014, the groundwater extracted at GW-2 is from the second aquifer, there is the intrusion of saline water from Yangon River. Moreover, this aquifer is closed to ground surface and overlain by the unconsolidated soil layer. Consequently, the groundwater in this aquifer may be contaminated in terms of saline water intrusion as well as seepage of contaminated runoff through overlaying soil layer. However, the result of E. Coli of (GW-2) was under the reference value. Therefore, although the target value of total coliform exceeded at monitoring point of (GW-2), 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 reference tube well (GW-2) exceeded the target value. Comparison with previous monitoring results of GW-2 since April 2019, the iron concentration results are ranging from 0.108 mg/l in April 2023 to 14.100 mg/l in December 2023 and most of the iron concentration results (from April 2019 to February 2024) exceeded the target value except the results of August 2019, February and April 2022, and April 2023. Therefore, the possible reasons may due to the influence of natural origin (iron can reach out from soil by run-off). Moreover, Thilawa SEZ area is mainly composed of iron rich soil (lateritic soil), and it can be saturated in the underlying confined aquifer.

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

No.	Parameters	Unit	GW-2	Vietnam Ground Water Standard
1	Water Temperature	°C	27	-
2	pH	-	6.3	5.5 - 8.5
3	Dissolved Oxygen (DO)	mg/l	7.95	-
4	Suspended Solid (SS)	mg/l	2	-
5	$BOD_{(5)}$	mg/l	5.93	-
6	$COD_{(Cr)}$	mg/l	< 0.7	-
7	Color	TCU (True Color Unit)	43.53	-
8	Odor	TON (Threshold Odor Number)	1	-
9	Oil and Grease	mg/l	< 3.1	-
10	Total Nitrogen (T-N)	mg/l	0.7	-
11	Total Phosphorous (T-P)	mg/l	0.67	-
12	Total Coliform	MPN/100ml	1600.0	3
13	Total Dissolved solids (TDS)	mg/l	168	1500
14	Iron	mg/l	5.252	5
15	Mercury	mg/l	≤ 0.002	0.001
16	Escherichia Coli	MPN/100ml	< 1.8	(100)* (MPN/100ml)
17	Flow Rate	m^3/s	-	-

Note: Red color means the exceeded results than Vietnam Groundwater standards.
Vietnam Groundwater Standard (No: QCVN 09-MT:2015/BTNMT)
*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-MT: 2015/BTNMT) is set as a reference value of self-monitoring for ground water monitoring.
Source: Myanmar Koei International Ltd.

2.5.3 Comparison of Results of Water Quality Exceed the Target Value between Previous Monitoring and February 2024 Monitoring

In order to overview the exceed the target values of the concerned parameters during the present monitoring (February 2024), the results of the exceed parameters with respective sampling points are compared with the previous monitoring results since February 2023.

Regarding the results of the parameter of discharge point, total coliform amount at SW-7 is higher than the target value during the surveys except April 2023, ranging from 2300 MPN/100ml to the detection limit (>160000 MPN/100ml). Total coliform concentration at SW-7 is obviously reached to the detection limit in the early and mid-rainy season, and winter season and it might be the effect of storm water run-off. The result of iron at SW-7 is higher than the target value in this time (February 2024) as well as in December 2023. Noticeably, iron concentration of SW-7 are higher during winter season. Moreover, iron concentration at GW-2 is always higher than the target value except the result of April 2023. It is observed that iron concentration at GW-2 is higher throughout monsoon and winter season. As for the total coliform result at GW-2, the values are higher than the target value only in April, June 2023 and February 2024. It is clear that total coliform concentrations at GW-2 are higher during dry season (April 2023 and February 2024) and early rainy season (June 2023).

On the other hand, it is observed that the result of SS concentration, the results at the reference monitoring point (SW-4) are higher than the target value. As for the result of SS concentration, the result of SW-4 is higher than the target value during the surveys except April 2023, ranging from 78 to 528 mg/l. It is clear that SS concentrations at SW-4 are higher during rainy and winter seasons due to the run-off water from the surrounding. It is obvious that total coliform at SW-2 is higher in all monitoring surveys, ranging from 1700 to >160000 MPN/100ml and total coliform at SW-4 is higher in all monitoring surveys, ranging from 4600 to >160000 MPN/100ml. Especially the total coliform amount at SW-2 and SW-4 were reached to the detection limit (>160000 MPN/100ml) in June 2023 and February 2024. The result of iron at SW-4 are also higher than the target value in four to five monitoring surveys. It is revealed that high concentration of iron at SW-4 is higher in five monitoring surveys (June, August, October, December 2023 and February 2024) ranging from 6.88 to 24.000 mg/l. It is revealed that high concentration of iron at SW-4 occurred throughout rainy season till winter season. It is possible to say that the present condition of the water quality reflects the background condition of the surrounding environment of Thilawa SEZ.

The expected reasons for the results exceed the target value of concerned parameters are discussed in the upper section of this monitoring report.

CHAPTER 3: CONCLUSION AND RECOMMENDATIONS

As described in Chapter 2 (Section 2.5), the results of total coliform at (SW-2, SW-4 and SW-7), iron at (SW-4 and SW-7) and suspended solid (SS) at (SW-4) in surface water, and the result of total coliform and iron at (GW-2) in ground water exceeded the target value in this monitoring period for operation stage of Thilawa SEZ Zone B.

As for the result of total coliform of surface water, result at the main discharging point of Zone B (SW-7) before discharging to the creek, exceeded the target value due to the expected reason; the potential expected reason might be natural bacteria existed in all area of Zone B because the existing of various kinds of vegetation and aquatic animals, especially fecal contamination from the animals, and the contaminants from the surroundings into the retention pond may contain fecal matter and other pollutants, leading to increase coliform levels.

Since the composition of the total coliform include bacteria from natural origin, and total coliform do not affect human health directly, E. Coli analysis was carried out alternatively to identify the health impact by coliform bacteria. As for the result of E. Coli of surface water at the main discharging point of Zone B (SW-7), the result was under the reference value. Therefore, although the target value of total coliform was exceeded at the main discharging point of Zone B (SW-7) but it is considered that there is no significant impact on human health.

As for the result of iron, the result at the main discharging point of Zone B (SW-7) before discharging to the creek exceeded the target value. The possible reasons may be due to the influence of natural origin (iron can reach out from soil by run-off). Surroundings of the Thilawa SEZ especially small hilly areas are mainly composed of iron rich soil (lateritic soil), and it can be transported to the low land area by strong wind. Moreover, iron remains in the natural environment for a long time. Regarding SW-2 and SW-4, SS concentration are 20 mg/l and 528 mg/l, while iron concentration occur 1.164 mg/l and 24.000 mg/l respectively. It can be clearly seen that the lower suspended solid concentrations generally have lower iron concentrations and higher suspended solid concentrations generally have higher iron concentrations.

The result of total coliform at reference monitoring points (SW-2 and SW-4), SS and iron at reference monitoring point (SW-4) exceeded the target values. The exceeded results for total coliform at (SW-2 and SW-4) maybe due to three expected reasons; i) the existing of various kinds of vegetation and aquatic animals, especially fecal contamination from the animals, ii) contaminants from the surroundings into the Shwe Pyauk creek may contain fecal matter and other pollutants, leading to increase coliform levels and iii) incoming tidal water can contain the fecal matter and delivered along Shwe Pyauk creek during flood tide.

The exceeded results for SS at (SW-4) maybe due to two expected reasons; i) delivered from upstream area such as natural origin and wastewater from local industrial zone which is located outside of Thilawa SEZ, and ii) influence by water from the downstream of monitoring points due to backflow by tidal fluctuation along Shwe Pyauk creek.

The expected reason for exceeding the target value of iron at reference monitoring point (SW-4) may be due to the influence of natural origin (iron can reach out from soil by run-off), the surrounding high land areas is comprised of lateritic soils and it can be transported to the low land area by run-off or strong wind.

As for the result of total coliform in ground water, results at (GW-2) exceeded the target value. It may be possible due to the poor maintenance of well which can increase the risk of bacteria and other harmful organisms. According to the information by monastery, the depth of tube well (GW-2) is about 30 m. By referring the report "Data Collection Survey on Water Resources Potential for Thilawa SEZ and Adjoining Areas" prepared by JICA in 2014, the groundwater extracted at GW-2 is from the second aquifer, there is the intrusion of saline water from Yangon River. Moreover, this aquifer is closed to ground surface and overlain by the unconsolidated soil layer. Consequently, the groundwater in this aquifer may be contaminated in terms of saline water intrusion as well as seepage of contaminated

runoff through overlaying soil layer. However, the result of E. Coli of (GW-2) was under the reference value. Therefore, although the target value of total coliform exceeded at monitoring point of (GW-2), 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 reference tube well (GW-2) exceeded the target value. Comparison with previous monitoring results of GW-2 since April 2019, the iron concentration results are ranging from 0.108 mg/l in April 2023 to 14.100 mg/l in December 2023 and most of the iron concentration results (from April 2019 to February 2024) exceeded the target value except the results of August 2019, February and April 2022, and April 2023. Therefore, the possible reasons may due to the influence of natural origin (iron can reach out from soil by run-off). Moreover, Thilawa SEZ area is mainly composed of iron rich soil (lateritic soil), and it can be saturated in the underlying confined aquifer.

As for future subject for main discharged points of Thilawa SEZ Zone B, the following action may be taken to maintain the target value of total coliform and iron and appropriate water quality monitoring:

- To continue monitoring Escherichia coli (E. coli) level to identify health impact by coliform bacteria.
- To monitor the possibility of the domestic wastewater from the factories.

End of the Document

APPENDIX-1 FIELD SURVEY PHOTOS

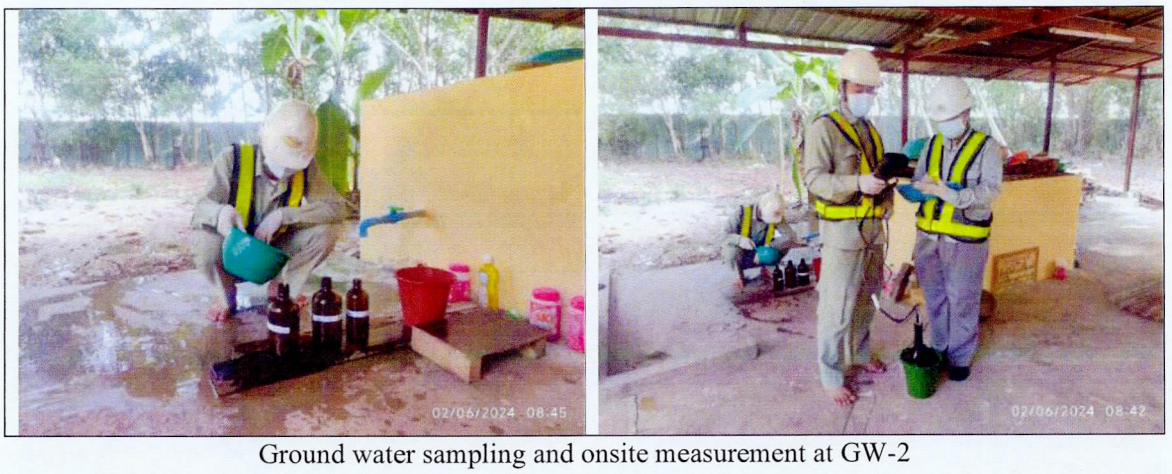
FOR DISCHARGED POINT OF THILAWA SEZ ZONE B

Surface water sampling and onsite measurement at SW-7

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-2

APPENDIX-2 LABORATORY RESULTS

FOR DISCHARGED POINT

DOWA

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Doc No: GEM-LB-R006E/00/AD
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Report No. : GEM-LAB-202402041
Revision No. : 1
Report Date : 21 February, 2024
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-7-0206
Sample No. : W-2402025
Waste Profile No. : -

Sampling Date : 6 February, 2024
Sampling By : Customer
Sample Received Date : 6 February, 2024
Analytical Date : 6-21/02/2024

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	36	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	6.61	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	17.3	0.7
4	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	<3.1	3.1
5	Color	APHA 2120C (Spectrophotometric Method)	TCU	8.30	0.00
6	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	3.2	0.5
7	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.20	0.05
8	TDS	APHA 2540 C (Total Dissolved Solids Dried at 180'C Method)	mg/l	386	-
9	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.002
10	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.002
11	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	3.536	0.002
12	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	1400.0	1.8
13	Odor	APHA 2150 B (Threshold Odor Test)	TON	1.4	0
14	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	4.5	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 :
Cherry Myint Thein
Assistant Manager

LAB 21/2/24 GEM

Approved By :
Ni Ni Aye Lwin Feb 21, 2024
Manager

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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motivate our planet
Doc No: GEM LB-R006E/00/AD
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Report No. : GEM-LAB-202402038
Revision No. : 1
Report Date : 21 February, 2024
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-2-0206
Sample No. : W-2402022
Waste Profile No. : -

Sampling Date : 6 February, 2024
Sampling By : Customer
Sample Received Date : 6 February, 2024
Analytical Date : 6-21/02/2024

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	20	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	11.63	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	36.8	0.7
4	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	<3.1	3.1
5	Color	APHA 2120C (Spectrophotometric Method)	TCU	18.43	0.00
6	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	2.8	0.5
7	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.21	0.05
8	TDS	APHA 2540 C (Total Dissolved Solids Dried at 180'C Method)	mg/l	1932	-
9	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.002
10	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.002
11	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	1.164	0.002
12	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	>160000	1.8
13	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-202402039
Revision No. : 1
Report Date : 21 February, 2024
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-4-0206
Sample No. : W-2402023
Waste Profile No. : -

Sampling Date : 6 February, 2024
Sampling By : Customer
Sample Received Date : 6 February, 2024
Analytical Date : 6-21/02/2024

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	528	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	3.50	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	11.7	0.7
4	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	<3.1	3.1
5	Color	APHA 2120C (Spectrophotometric Method)	TCU	11.29	0.00
6	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	7.1	0.5
7	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	1.05	0.05
8	TDS	APHA 2540 C (Total Dissolved Solids Dried at 180'C Method)	mg/l	604	-
9	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.002
10	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.002
11	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	24.000	0.002
12	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	>160000	1.8
13	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

LAB 21/2/24 GEM

Analysed By :
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Ni Ni Aye Lwin Feb 21, 2024
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Myanmar Japan Thilawa Development Limited MJTD

DOWA

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Report No. : GEM-LAB-202402042
Revision No. : 1
Report Date : 21 February, 2024
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-2-0206
Sample No. : W-2402026
Waste Profile No. : -

Sampling Date : 6 February, 2024
Sampling By : Customer
Sample Received Date : 6 February, 2024
Analytical Date : 6-21/02/2024

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105°C Method)	mg/l	2	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	5.93	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	<0.7	0.7
4	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	<3.1	3.1
5	Color	APHA 2120C (Spectrophotometric Method)	TCU	43.53	0.00
6	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	0.7	0.5
7	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.67	0.05
8	TDS	APHA 2540 C (Total Dissolved Solids Dried at 180°C Method)	mg/l	168	-
9	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.002
10	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.002
11	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	5.252	0.002
12	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	1600.0	1.8
13	Odor	APHA 2150 B (Threshold Odor Test)	TON	1	0
14	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

APHA 2120B.6(b); Color Unit - TCU(True Color Unit). One TCU is equivalent to one Hazen unit and to one Pt-Co unit.

Analysed By :

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Approved By :

Ni Ni Aye Lwin Feb 21, 2024
Manager

Myanmar Japan Thilawa Development Limited MJTD

Thilawa Special Economic Zone

Zone B– Phase 1,2 & 3 (Operation phase)

Appendix-B

Water and Waste Water Monitoring Report

April 2024

WATER QUALITY MONITORING REPORT

FOR DEVELOPMENT OF INDUSTRIAL AREA

IN THILAWA SEZ ZONE B

(PHASE 1, 2 & 3 OPERATION STAGE)

(Bi-Monthly Monitoring)

April 2024

Myanmar Koei International Ltd.

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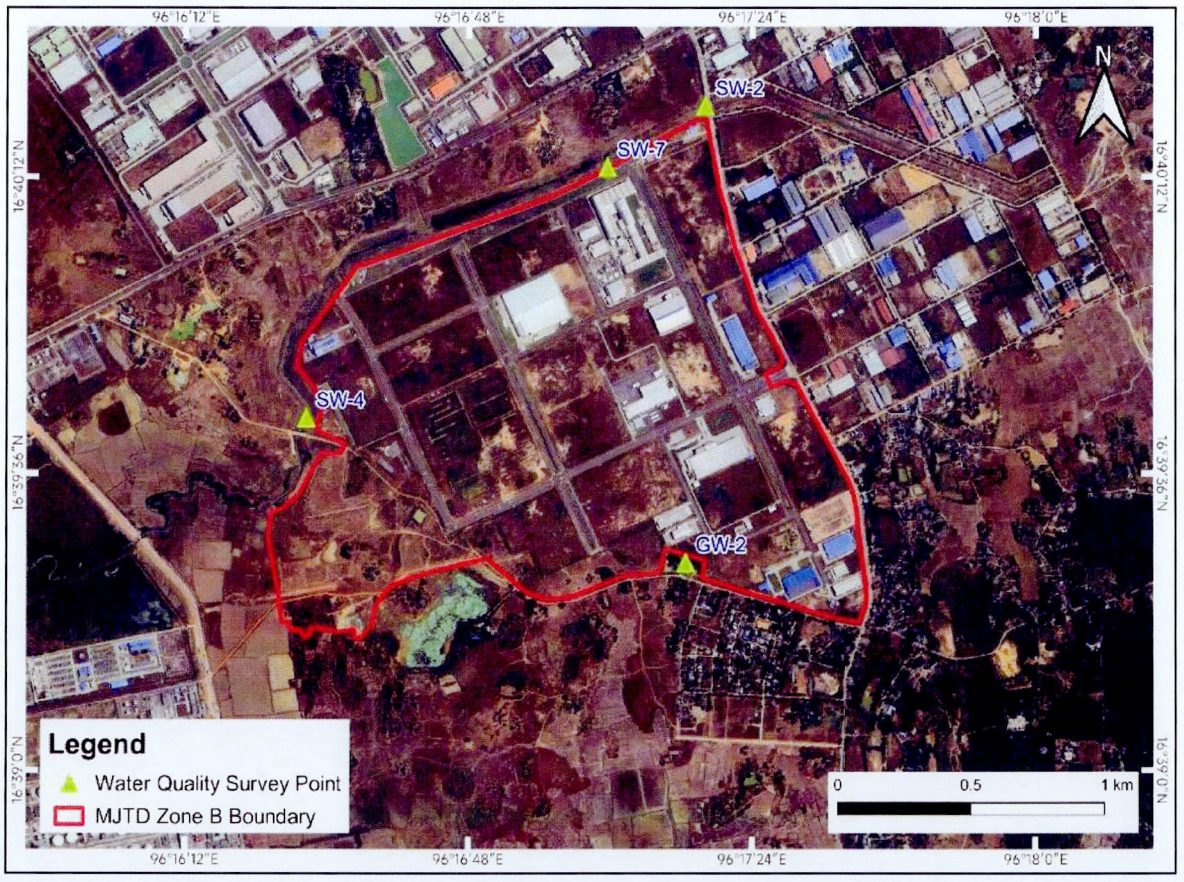
CHAPTER 1: INTRODUCTION

1.1 General

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



Source: Google Earth

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

CHAPTER 2: WATER QUALITY MONITORING

2.1 Monitoring Items

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

Water quality sampling was carried out at four locations. Among the four locations, water flow measurement at one location (SW-4) can be carried out by current meter. However, water flow measurement cannot be conducted with current meter at two locations (SW-2 and SW-7) because no water flow was at SW-2 and water gate at SW-7 was closed during sampling. Monitoring items and sampling points are summarized in Table 2.1-1.

Table 2.1-1 Monitoring Items for Water Quality

No.	Parameters	SW-2	SW-4	SW-7	GW-2	Remarks
1	Water Temperature	○	○	○	○	On-site measurement
2	pH	○	○	○	○	On-site measurement
3	Dissolved Oxygen (DO)	○	○	○	○	On-site measurement
4	Suspended Solid (SS)	○	○	○	○	Laboratory analysis
5	$BOD_{(5)}$	○	○	○	○	Laboratory analysis
6	$COD_{(Cr)}$	○	○	○	○	Laboratory analysis
7	Color	○	○	○	○	Laboratory analysis
8	Odor	○	○	○	○	Laboratory analysis
9	Oil and Grease	○	○	○	○	Laboratory analysis
10	Total Nitrogen (T-N)	○	○	○	○	Laboratory analysis
11	Total Phosphorus (T-P)	○	○	○	○	Laboratory analysis
12	Total Coliform	○	○	○	○	Laboratory analysis
13	Total Dissolved solids (TDS) (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-2	**Coordinate-** N - 16° 40' 20.69", E - 96° 17' 18.04"
		Location - Upstream of Shwe Pyauk Creek
		Survey Item - Surface water sampling
2	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
3	SW-7	**Coordinate** - N - 16° 40' 13.25", E - 96° 17' 5.66"
		Location – Outlet of retention pond of Zone B before connecting to Shwe Pyauk Creek
		Survey Item - Discharge water sampling
4	GW-2	**Coordinate** - N - 16° 39' 25.30", E - 96° 17' 15.60"
		Location - In the monastery compound of Phalan village
		Survey Item - Ground water sampling

Source: Myanmar Koei International Ltd.

SW-2 (Reference Point)

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

SW-7 (Discharged Point)

SW-7 is main discharged point of Zone B during operation stage. The distance is about 434 m downstream of SW-2. This sampling point is located at outlet of retention pond of Zone B, in the north of Zone B area and in the south of Dagon-Thilawa road. The surrounding areas are Zone A in the north and local industrial zone in the east respectively.

GW-2 (Reference of Existing Tube Well)

GW-2 was collected from tube well as ground water sample. It is located in the monastery compound of Phalan village. The surrounding areas are Thilawa SEZ Zone A in the north, Phalan village in the south and fields in the west and local industrial zone in the northeast and operation of Thilawa SEZ Zone B in the east and northeast 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 measured by using the on-site instrument "JFE 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	Suspended Solid (SS)	APHA 2540D (Dry at 103-105°C Method)
5	$BOD_{(5)}$	APHA 5210 B (5 days BOD Test)
6	$COD_{(Cr)}$	APHA 5220D (Close Reflux Colorimetric Method)
7	Color	APHA 2120C (Spectrophotometric Method)
8	Odor	APHA 2150 B (Threshold Odor Test)
9	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)
10	Total Nitrogen (T-N)	HACH Method 10072 (TNT Persulfate Digestion Method)
11	Total Phosphorous (T-P)	APHA 4500-P E (Ascorbic Acid Method)
12	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)
13	Total Dissolved Solids (TDS)	APHA 2540C (Total Dissolved Solids Dried at 180°C Method)
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 AEM 213-D Digital Current Meters)

Source: Myanmar Koei International Ltd.

2.4 Monitoring Period

Water quality and water flow rate monitoring were conducted on 24 April 2024, and sampling time is shown in Table 2.4-1 to avoid tidal effect. The tide record for Yangon River, Myanmar 24 April 2024 is shown in Table 2.4-2.

Table 2.4-1 Sampling Time of Each Point

No.	Station	Sampling Time
1	SW-2	24/04/2024 08:57
2	SW-4	24/04/2024 09:21
3	SW-7	24/04/2024 09:48
4	GW-2	24/04/2024 08:25

Source: Myanmar Koei International Ltd.

Table 2.4-2 Tide Record for Yangon River, Myanmar

Date	Time	Height (m)	Tide Conditions
24/04/2024	00:10	0.71	Low Tide
	04:49	5.42	High Tide
	12:09	0.58	Low Tide
	16:55	5.80	High Tide

Source: Myanmar Port Authority, Tide Table for the Yangon River and Elephant Point, 2024.

2.5 Monitoring Results

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

2.5.1 Results of Discharged Point and Discharged Creek

As the comparison with the target value, the results of suspended solid (SS), total coliform, total dissolve solid (TDS) and iron exceeded the limitations.

Result of Discharged Point

As for the result of total coliform of surface water, result at the main discharging point of Zone B (SW-7) before discharging to the creek, exceeded the limitation due to the expected reason; the potential expected reason might be natural bacteria existed in all area of Zone B because the existing of various kinds of vegetation and aquatic animals, especially fecal contamination from the animals, and the contaminants from the surroundings into the retention pond may contain fecal matter and other pollutants, leading to increase coliform levels.

Since the composition of the total coliform include bacteria from natural origin, and total coliform do not affect human health directly, E. Coli analysis was carried out alternatively to identify the health impact by coliform bacteria. As for the result of E. Coli of surface water at the main discharging point of Zone B (SW-7), the result was within limitation. Therefore, although the limitation of total coliform was exceeded at the main discharging point of Zone B (SW-7) but it is considered that there is no significant impact on human health.

As for the result of TDS, result at the main discharging point of Zone B (SW-7) before discharging to the creek, exceeded the limitation due to the surface water run-off from bare land in Zone B.

As for the result of iron, the result at the main discharging point of Zone B (SW-7) before discharging to the creek exceeded the limitation. The possible reasons may be due to the influence of natural origin (iron can reach out from soil by run-off). Surroundings of the Thilawa SEZ especially small hilly areas are mainly composed of iron rich soil (lateritic soil), and it can be transported to the low land area by strong wind. Moreover, iron remains in the natural environment for a long time. Table 2.5-1 shows the results of water quality of the main discharged point of Zone B (SW-7) and reference monitoring points (SW-2 and SW-4). Regarding SW-2 and SW-4, SS concentration are 70 mg/l and 198 mg/l, while iron concentration occurred 4.020 mg/l and 22.080 mg/l respectively. It can be clearly seen that the lower suspended solid concentrations generally have lower iron concentrations and higher suspended solid concentrations generally have higher iron concentrations.

Result of Reference Monitoring points (Discharged Creek)

As for the result of SS and TDS, results at the surface water monitoring points (SW-2) and (SW-4) exceeded the limitations. The exceeded results for SS and TDS maybe due to two expected reasons; i) delivered from upstream area such as natural origin and wastewater from local industrial zone which is located outside of Thilawa SEZ, and ii) influence by water from the downstream of monitoring points due to backflow by tidal fluctuation along Shwe Pyauk creek.

As for the result of total coliform, results at surface water monitoring points (SW-2) and (SW-4) exceeded the limitation due to three expected reasons: i) the existing of various kinds of vegetation and aquatic animals, especially fecal contamination from the animals, ii) contaminants from the surroundings into the Shwe Pyauk creek may contain fecal matter and other pollutants, leading to increase coliform levels and iii) incoming tidal water can contain the fecal matter and delivered along Shwe Pyauk creek during flood tide.

As for the result of iron, the results at the monitoring points of surface water (SW-2) and (SW-4) exceeded the limitation. The possible reason for exceeded value in surface water (SW-2) and (SW-4) may be due to the influence of natural origin (iron can reach out from the soil by run-off). Surroundings

of the Thilawa SEZ especially small hilly areas are mainly composed of iron rich soil (lateritic soil), and it can be transported to the low land area by run-off or strong wind.

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

No.	Parameters	Unit	SW-2	SW-4	SW-7	Target Value
1	Water Temperature	°C	30	30	32	≤ 35
2	pH	-	7.1	7.5	8.0	6~9
3	Dissolved Oxygen (DO)	mg/l	4.65	4.99	6.89	-
4	Suspended Solid (SS)	mg/l	70	198	38	50
5	$BOD_{(5)}$	mg/l	11.67	10.31	14.77	30
6	$COD_{(Cr)}$	mg/l	33.1	21.6	25.3	125
7	Color	TCU (True Color Unit)	15.50	8.00	8.00	150
8	Odor	TON (Threshold Odor Number)	1.4	1.4	1	-
9	Oil and Grease	mg/l	< 3.1	< 3.1	< 3.1	10
10	Total Nitrogen (T-N)	mg/l	0.9	1.5	0.7	80
11	Total Phosphorus (T-P)	mg/l	< 0.05	0.14	< 0.05	2
12	Total Coliform	MPN/100ml	24000.0	> 160000	> 160000	400
13	Total Dissolved solids (TDS)	mg/l	3258	3700	3580	2000
14	Iron	mg/l	4.020	22.080	3.700	3.5
15	Mercury	mg/l	≤ 0.002	≤ 0.002	≤ 0.002	0.005
16	Escherichia Coli	MPN/100ml	-	-	< 1.8	(1000)* (CFU/100ml)
17	Flow Rate	m^3/s	-	0.50	-	-

Note: Red color means exceeded value than target value.

*Note: Based on the water utilization at discharged creek, the 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 Result of Reference Tube Well

Result of water quality monitoring at reference tube well monitoring point is shown in Table 2.5-2. As the comparison with the target value, the result of total coliform and iron exceeded the limitation.

For the ground water quality, National Technical Regulation on Ground Water Quality (No. QCVN 09-MT: 2015/BTNMT) in Vietnam is used as a reference because Myanmar does not have any ground water guidelines and standards, and most of the analyzed parameter are included in Vietnam standard rather the those stipulated by neighboring countries. For the result of Escherichia Coli, B1 (Irrigation water) of National Technical Regulation on Surface Water Quality (No. QCVN 08-MT: 2015/BTNMT) in Vietnam is referred, as no standard for E.coli is mentioned in Vietnam ground water regulation.as a reference. In addition, the target values of effluent water quality discharging to water body stipulated in the EIA report are also considered for comparison with ground water quality.

As for the result of total coliform in ground water, results at (GW-2) exceeded the limitation. It may be due to the poor maintenance of well which can increase the risk of bacteria and other harmful organisms. According to the information by monastery, the depth of tube well (GW-2) is about 30 m. By referring the report "Data Collection Survey on Water Resources Potential for Thilawa SEZ and Adjoining Areas" prepared by JICA in 2014, the groundwater extracted at GW-2 is from the second aquifer, there is the intrusion of saline water from Yangon River. Moreover, this aquifer is closed to ground surface and overlain by the unconsolidated soil layer. Consequently, the groundwater in this aquifer may be contaminated in terms of saline water intrusion as well as seepage of contaminated runoff through overlaying soil layer. However, the result of E. Coli of (GW-2) was within the limitation. Therefore, although the limitation of total coliform exceeded at monitoring point of (GW-2), 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 reference tube well (GW-2) exceeded the limitation. Comparison with previous monitoring results of GW-2 since April 2019, the iron concentration results are ranging from 0.108 mg/l in April 2023 to 14.100 mg/l in December 2023 and most of the iron concentration results (from April 2019 to April 2024) exceeded the limitation except the results of August 2019, February and April 2022, and April 2023. Therefore, the possible reasons may due to the influence of natural origin (iron can reach out from soil by run-off). Moreover, Thilawa SEZ area is mainly composed of iron rich soil (lateritic soil), and it can be saturated in the underlying confined aquifer.

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

No.	Parameters	Unit	GW-2	Vietnam Ground Water Standard	Target Value
1	Water Temperature	˚C	28	-	≤ 35
2	pH	-	6.3	5.5 - 8.5	6~9
3	Dissolved Oxygen (DO)	mg/l	6.44	-	-
4	Suspended Solid (SS)	mg/l	46	-	50
5	$BOD_{(5)}$	mg/l	3.78	-	30
6	$COD_{(Cr)}$	mg/l	< 0.7	-	125
7	Color	TCU (True Color Unit)	71.75	-	150
8	Odor	TON (Threshold Odor Number)	1	-	-
9	Oil and Grease	mg/l	< 3.1	-	10
10	Total Nitrogen (T-N)	mg/l	< 0.5	-	80
11	Total Phosphorous (T-P)	mg/l	0.52	-	2
12	Total Coliform	MPN/100ml	24000.0	3	400
13	Total Dissolved solids (TDS)	mg/l	202	1500	2000
14	Iron	mg/l	12.720	5	3.5
15	Mercury	mg/l	≤ 0.002	0.001	0.005
16	Escherichia Coli	MPN/100ml	< 1.8	(100)* (MPN/100ml)	(100)* (MPN/100ml)
17	Flow Rate	m^3/s	-	-	-

Note: Red color means the exceeded results than Vietnam Groundwater standards and target value.
Vietnam Groundwater Standard (No: QCVN 09-MT:2015/BTNMT)
*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-MT: 2015/BTNMT) is set as a reference value of self-monitoring for ground water monitoring.
Source: Myanmar Koei International Ltd.

2.5.3 Comparison of Results of Water Quality Exceed the Target Value between Previous Monitoring and April 2024 Monitoring

In order to overview the exceed the limitations of the concerned parameters during the present monitoring (April 2024), the results of the exceed parameters with respective sampling points are compared with the previous monitoring results since April 2023.

Regarding the results of the parameter of discharge point, total coliform amount at SW-7 is higher than the limitation during the surveys except April 2023, ranging from 1400 MPN/100ml to the detection limit (>160000 MPN/100ml). Total coliform concentration at SW-7 is obviously reached to the detection limit in the early-rainy season, winter season and summer season and it might be the effect of storm water run-off and high temperature. The result of total dissolved solid at SW-7 is higher than the limitation only in two monitoring survey as 9874 mg/l in April 2023 and 3580 mg/l in April 2024. It is observed that TDS concentration at SW-7 is higher at the summer season and it might be the effect of surface water run-off from bare land in Zone B and be attributable to greater solubility of ions at high temperature. The result of iron at SW-7 is higher than the limitation in December 2023, February and April 2024. Noticeably, iron concentration of SW-7 are higher during winter season and summer season. As for the total coliform result at GW-2, the values are higher than the limitation except August, October and December 2023. It is clear that total coliform concentrations at GW-2 are higher during dry season (April 2023 and February, April 2024) and early rainy season (June 2023). Moreover, iron concentration at GW-2 is always higher than the limitation except the result of April 2023. It is observed that iron concentration at GW-2 is higher throughout all three seasons.

On the other hand, it is observed that the results of SS concentration, the results at the reference monitoring point (SW-2 and SW-4) are higher than the limitation. As for the results of SS concentration, the result of SW-2 is higher than the limitation during the surveys except June, December 2023 and April 2024, ranging from 70 to 90 mg/l for SW-2 and the result of SW-4 is higher than the limitation during the surveys except April 2023, ranging from 102 to 528 mg/l for SW-4 respectively. It is assumed that SS concentrations at (SW-2 and SW-4) are higher during all three seasons due to the run-off water from the surrounding during the rainy season and surrounding temperature is very high during the summer season. It is obvious that total coliform at both SW-2 and SW-4 is higher in all monitoring surveys, ranging from 1700 to >160000 MPN/100ml for SW-2 and from 4600 to >160000 MPN/100ml for SW-4, respectively. Especially the total coliform amount at SW-2 and SW-4 were reached to the detection limit (>160000 MPN/100ml) in June 2023 and February, April 2024. The result of TDS at (SW-2 and SW-4) are higher than the limitation only in two monitoring survey (April 2023 and April 2024). It is obvious that TDS concentration at (SW-2 and SW-4) are higher at the summer season and it may be attributable to greater solubility of ions at high temperature. The results of iron at (SW-2 and SW-4) are also higher than the limitation in four to six monitoring surveys. It is revealed that high concentration of iron at SW-2 is higher in four monitoring surveys (June, August, December 2023 and April 2024) ranging from 4.06 to 8.346 mg/l and high concentration of iron at SW-4 is higher in six monitoring surveys (June, August, October, December 2023 and February, April 2024) ranging from 6.88 to 24.000 mg/l. It is revealed that high concentration of iron at (SW-2 and SW-4) occurred throughout all three seasons. It is possible to say that the present condition of the water quality reflects the background condition of the surrounding environment of Thilawa SEZ.

The expected reasons for the results exceed the limitation of concerned parameters are discussed in the upper section of this monitoring report.

CHAPTER 3: CONCLUSION AND RECOMMENDATIONS

As described in Chapter 2 (Section 2.5), the results of suspended solid (SS) at (SW-2 and SW-4), total coliform, total dissolved solid (TDS) and iron at (SW-2, SW-4 and SW-7) in surface water, and the result of total coliform and iron at (GW-2) in ground water exceeded the limitation in this monitoring period for operation stage of Thilawa SEZ Zone B.

As for the result of total coliform of surface water, result at the main discharging point of Zone B (SW-7) before discharging to the creek, exceeded the limitation due to the expected reason; the potential expected reason might be natural bacteria existed in all area of Zone B because the existing of various kinds of vegetation and aquatic animals, especially fecal contamination from the animals, and the contaminants from the surroundings into the retention pond may contain fecal matter and other pollutants, leading to increase coliform levels.

Since the composition of the total coliform include bacteria from natural origin, and total coliform do not affect human health directly, E. Coli analysis was carried out alternatively to identify the health impact by coliform bacteria. As for the result of E. Coli of surface water at the main discharging point of Zone B (SW-7), the result was under the reference value. Therefore, although the limitation of total coliform was exceeded at the main discharging point of Zone B (SW-7) but it is considered that there is no significant impact on human health.

As for the result of TDS, result at the main discharging point of Zone B (SW-7) before discharging to the creek, exceeded the limitation due to the surface water run-off from bare land in Zone B as well as the greater solubility of ions at high temperature.

As for the result of iron, the result at the main discharging point of Zone B (SW-7) before discharging to the creek exceeded the limitation. The possible reasons may be due to the influence of natural origin (iron can reach out from soil by run-off). Surroundings of the Thilawa SEZ especially small hilly areas are mainly composed of iron rich soil (lateritic soil), and it can be transported to the low land area by strong wind. Moreover, iron remains in the natural environment for a long time. Regarding SW-2 and SW-4, SS concentration are 70 mg/l and 198 mg/l, while iron concentration occurred 4.020 mg/l and 22.080 mg/l respectively. It can be clearly seen that the lower suspended solid concentrations generally have lower iron concentrations and higher suspended solid concentrations generally have higher iron concentrations.

As for parameters of SS, total dissolved solids, total coliform and iron in surface water exceeded the limitation at reference monitoring points. The exceeded result of SS and TDS at (SW-2) and (SW-4) maybe due to two expected reasons; i) delivered from upstream area such as natural origin and wastewater from local industrial zone which is located outside of Thilawa SEZ, and ii) influence by water from the downstream of monitoring points due to backflow by tidal fluctuation along Shwe Pyauk creek.

The exceeded results for total coliform at (SW-2) and (SW-4) may be due tothree expected reasons: i) the existing of various kinds of vegetation and aquatic animals, especially fecal contamination from the animals, ii) contaminants from the surroundings into the Shwe Pyauk creek may contain fecal matter and other pollutants, leading to increase coliform levels and iii) incoming tidal water can contain the fecal matter and delivered along Shwe Pyauk creek during flood tide.

The expected reason for exceeding the limitation of iron at reference monitoring points (SW-2) and (SW-4) may be due to the influence of natural origin (iron can reach out from the soil by run-off). Surroundings of the Thilawa SEZ especially small hilly areas are mainly composed of iron rich soil (lateritic soil), and it can be transported to the low land area by run-off or strong wind.

As for the result of total coliform in ground water, results at (GW-2) exceeded the limitation. It may be due to the poor maintenance of well which can increase the risk of bacteria and other harmful organisms. According to the information by monastery, the depth of tube well (GW-2) is about 30 m. By referring the report "Data Collection Survey on Water Resources Potential for Thilawa SEZ and Adjoining Areas" prepared by JICA in 2014, the groundwater extracted at GW-2 is from the second

aquifer, there is the intrusion of saline water from Yangon River. Moreover, this aquifer is closed to ground surface and overlain by the unconsolidated soil layer. Consequently, the groundwater in this aquifer may be contaminated in terms of saline water intrusion as well as seepage of contaminated runoff through overlaying soil layer. However, the result of E. Coli of (GW-2) was within the limitation. Therefore, although the limitation of total coliform exceeded at monitoring point of (GW-2), 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 reference tube well (GW-2) exceeded the limitation. Comparison with previous monitoring results of GW-2 since April 2019, the iron concentration results are ranging from 0.108 mg/l in April 2023 to 14.100 mg/l in December 2023 and most of the iron concentration results (from April 2019 to April 2024) exceeded the limitation except the results of August 2019, February and April 2022, and April 2023. Therefore, the possible reasons may due to the influence of natural origin (iron can reach out from soil by run-off). Moreover, Thilawa SEZ area is mainly composed of iron rich soil (lateritic soil), and it can be saturated in the underlying confined aquifer.

As for future subject for main discharged points of Thilawa SEZ Zone B, the following action may be taken to maintain the limitation of total coliform, total dissolved solid and iron and appropriate water quality monitoring:

- To continue monitoring Escherichia coli (E. coli) level to identify health impact by coliform bacteria.
- To monitor the possibility of the domestic wastewater from the factories.

End of the Document

APPENDIX-1 FIELD SURVEY PHOTOS

FOR DISCHARGED POINT OF THILAWA SEZ ZONE B

Surface water sampling and onsite measurement at SW-7

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-2

APPENDIX-2 LABORATORY RESULTS

FOR DISCHARGED POINT

DOWA

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Doc No: GEM-LB-R006E/01/AD
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Report No. : GEM-LAB-202405012
Revision No. : 1
Report Date : 9 May, 2024
Application No. : 0001-C001

Test 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-7-0424
Sample No. : W-2404104
Waste Profile No. : -

Sampling Date : 24 April, 2024
Sampling By : Withdraw GEM
Sample Received Date : 24 April, 2024
Analytical Date : 24/4-09/5/2024

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	38	_
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	14.77	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	25.3	0.7
4	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	<3.1	3.1
5	Color	APHA 2120C (Spectrophotometric Method)	TCU	8.00	0.00
6	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	0.7	0.5
7	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	<0.05	0.05
8	TDS	APHA 2540 C (Total Dissolved Solids Dried at 180'C Method)	mg/l	3580	_
9	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.002
10	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.002
11	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	3.700	0.002
12	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	>160000	1.8
13	Odor	APHA 2150 B (Threshold Odor Test)	TON	1	0
14	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

LAB GEM May 9, 2024

Analysed By :
Cherry Myint Thein
Assistant Manager

Approved By :
Ni Ni Aye Lwin May 9, 2024
Manager

*** End of Document ***

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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Doc No: GEM-LB-R006E/01/A0
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Report No. : GEM-LAB-202405009
Revision No. : 1
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Application No. : 0001-C001

Test 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-2-0424
Sample No. : W-2404101
Waste Profile No. : -

Sampling Date : 24 April, 2024
Sampling By : Withdraw GEM
Sample Received Date : 24 April, 2024
Analytical Date : 24/4-09/5/2024

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	70	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	11.67	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	33.1	0.7
4	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	<3.1	3.1
5	Color	APHA 2120C (Spectrophotometric Method)	TCU	15.50	0.00
6	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	0.9	0.5
7	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	<0.05	0.05
8	TDS	APHA 2540 C (Total Dissolved Solids Dried at 180'C Method)	mg/l	3258	-
9	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.002
10	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.002
11	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	4.020	0.002
12	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	24000.0	1.8
13	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

Analysed By :
Cherry Myint Thein
Assistant Manager

LAB
May 9, 2024
GEM

Approved By :
Ni Ni Aye Lwin May 9, 2024
Manager

*** End of Document ***

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-202405010
Revision No. : 1
Report Date : 9 May, 2024
Application No. : 0001-C001

Test 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-4-0424
Sample No. : W-2404102
Waste Profile No. : -

Sampling Date : 24 April, 2024
Sampling By : Withdraw GEM
Sample Received Date : 24 April, 2024
Analytical Date : 24/4-09/5/2024

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105°C Method)	mg/l	198	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	10.31	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	21.6	0.7
4	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	<3.1	3.1
5	Color	APHA 2120C (Spectrophotometric Method)	TCU	8.00	0.00
6	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	1.5	0.5
7	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.14	0.05
8	TDS	APHA 2540 C (Total Dissolved Solids Dried at 180°C Method)	mg/l	3700	-
9	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.002
10	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.002
11	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	22.080	0.002
12	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	>160000	1.8
13	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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May 9, 2024
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Japan Thilawa Development Limited
MJTD
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DOWA

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Report No. : GEM-LAB-202405013
Revision No. : 1
Report Date : 9 May, 2024
Application No. : 0001-C001

Test 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-2-0424 — Sampling Date : 24 April, 2024

Sample No. : W-2404105 — Sampling By : Withdraw GEM

Waste Profile No. : - — Sample Received Date : 24 April, 2024

Analytical Date : 24/4-09/5/2024

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	46	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	3.78	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	<0.7	0.7
4	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	<3.1	3.1
5	Color	APHA 2120C (Spectrophotometric Method)	TCU	71.75	0.00
6	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	<0.5	0.5
7	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.52	0.05
8	TDS	APHA 2540 C (Total Dissolved Solids Dried at 180'C Method)	mg/l	202	-
9	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.002
10	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.002
11	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	12.720	0.002
12	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	24000.0	1.8
13	Odor	APHA 2150 B (Threshold Odor Test)	TON	1	0
14	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

APHA 2120B.6(b); Color Unit - TCU(True Color Unit).
One TCU is equivalent to one Hazen unit and to one Pt-Co unit.

Analysed By :

Cherry Myint Thein
Assistant Manager

LAB GEM May 9, 2024

Approved By :

Ni Ni Aye Lwin May 9, 2024
Manager

*** End of Document ***

Japan Thilawa Development Myanmar Limited MJTD

Thilawa Special Economic Zone

Zone B– Phase 1, 2,3 (Operation phase)

Appendix-C

Water and Waste Water Monitoring Report

June 2024

WATER QUALITY MONITORING REPORT

FOR DEVELOPMENT OF INDUSTRIAL AREA

IN THILAWA SEZ ZONE B

(PHASE 1, 2 & 3 OPERATION STAGE)

(Bi-Annually Monitoring)

June 2024

Myanmar Koei International Ltd.

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CHAPTER 1: INTRODUCTION

1.1 General

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

Source: Google Earth

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

CHAPTER 2: WATER QUALITY MONITORING

2.1 Monitoring Items

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

Water quality sampling was carried out at five locations. Among the five locations, water flow measurement at two locations (SW-2 and SW-4) can be carried out by current meter. However, water flow measurement cannot be conducted with current meter at two locations (SW-7 and SW-8) because water gates at SW-7 and SW-8 were closed during sampling. Monitoring items and sampling points are summarized in Table 2.1-1.

Table 2.1-1 Monitoring Items for Water Quality

No.	Parameters	SW-2	SW-4	SW-7	SW-8	GW-2	Remarks
1	Water Temperature	○	○	○	○	○	On-site measurement
2	pH	○	○	○	○	○	On-site measurement
3	Dissolved Oxygen (DO)	○	○	○	○	○	On-site measurement
4	Suspended Solids (SS)	○	○	○	○	○	Laboratory analysis
5	$BOD_{(5)}$	○	○	○	○	○	Laboratory analysis
6	$COD_{(Cr)}$	○	○	○	○	○	Laboratory analysis
7	Total Coliform	○	○	○	○	○	Laboratory analysis
8	Oil and Grease	○	○	○	○	○	Laboratory analysis
9	Total Nitrogen (T-N)	○	○	○	○	○	Laboratory analysis
10	Total Phosphorous (T-P)	○	○	○	○	○	Laboratory analysis
11	Color	○	○	○	○	○	Laboratory analysis
12	Odor	○	○	○	○	○	Laboratory analysis
13	Ammonia	○	○	○	○	○	Laboratory analysis
14	Total Dissolved Solids	○	○	○	○	○	Laboratory analysis
15	Mercury	○	○	○	○	○	Laboratory analysis
16	Zinc	○	○	○	○	○	Laboratory analysis
17	Arsenic	○	○	○	○	○	Laboratory analysis
18	Chromium	○	○	○	○	○	Laboratory analysis
19	Cadmium	○	○	○	○	○	Laboratory analysis
20	Selenium	○	○	○	○	○	Laboratory analysis
21	Lead	○	○	○	○	○	Laboratory analysis
22	Copper	○	○	○	○	○	Laboratory analysis
23	Barium	○	○	○	○	○	Laboratory analysis
24	Nickel	○	○	○	○	○	Laboratory analysis
25	Silver	○	○	○	○	○	Laboratory analysis
26	Iron	○	○	○	○	○	Laboratory analysis
27	Cyanide	○	○	○	○	○	Laboratory analysis
28	Total Cyanide	○	○	○	○	○	Laboratory analysis
29	Chromium (Hexavalent)	○	○	○	○	○	Laboratory analysis
30	Fluoride	○	○	○	○	○	Laboratory analysis
31	Free Chlorine	○	○	○	○	○	Laboratory analysis
32	Total Residual Chlorine	○	○	○	○	○	Laboratory analysis
33	Sulphide	○	○	○	○	○	Laboratory analysis
34	Formaldehyde	○	○	○	○	○	Laboratory analysis
35	Phenols	○	○	○	○	○	Laboratory analysis
36	Escherichia Coli	-	-	○	○	○	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-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
2	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
3	SW-7	**Coordinate** - N - 16° 40' 13.25", E - 96° 17' 5.66"
		Location – Outlet of retention pond of Zone B before connecting to Shwe Pyauk Creek
		Survey Item - Discharge water sampling
4	SW-8	**Coordinate** - N - 16° 39' 59.25", E - 96° 16' 32.77"
		Location – Another outlet of retention pond of Zone B before connecting to Shwe Pyauk Creek
		Survey Item - Discharge water sampling
5	GW-2	**Coordinate** - N - 16° 39' 25.30", E - 96° 17' 15.60"
		Location - In the monastery compound of Phalan village
		Survey Item - Ground water sampling

Source: Myanmar Koei International Ltd.

SW-2 (Reference Point)

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

SW-7 (Discharged Point)

SW-7 is main discharged point of Zone B during operation stage. The distance is about 434 m downstream of SW-2. This sampling point is located at outlet of retention pond of Zone B, in the north of Zone B area and in the south of Dagon-Thilawa road. The surrounding areas are Zone A in the north and local industrial zone in the east respectively.

SW-8 (Discharged Point)

SW-8 is another main discharged point of Zone B during operation stage. The distance is about 500 m upstream of SW-4. This sampling point is located in the south of Dagon-Thilawa road as well as 1 km southwest of SW-7 in the retention pond of Zone B. The surrounding areas are Zone A in the north and local industrial zone in the east respectively.

GW-2 (Reference of Existing Tube Well)

GW-2 was collected from tube well as ground water sample. It is located in the monastery compound of Phalan village. The surrounding areas are Thilawa SEZ Zone A in the north, Phalan village in the

south and fields in the west and local industrial zone in the northeast and operation of Thilawa SEZ Zone B in the east and northeast 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 measured by using the on-site instrument "JFE 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	Suspended Solids (SS)	APHA 2540 D (Dry at 103-105°C Method)
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	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)
9	Total Nitrogen (T-N)	HACH Method 10072(TNT Persulfate Digestion Method)
10	Total Phosphorous (T-P)	APHA 4500-P E (Ascorbic Acid Method)
11	Color	APHA 2120C (Spectrophotometric Method)
12	Odor	APHA 2150 B (Threshold Odor Test)
13	Ammonia	HACH Method 10205 (Silicylate TNT Plus Method)
14	Total Dissolved Solids	APHA 2540 C (Total Dissolved Solids Dried at 180°C Method)
15	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
16	Zinc	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
17	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
18	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
19	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
20	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
21	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
22	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
23	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
24	Nickel	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
25	Silver	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
26	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
27	Cyanide	HACH 8027 (Pyridine-Pyrazalone Method)
28	Total Cyanide	Distillation process: APHA 4500-CN-C. Total Cyanide after Distillation, Determine cyanide Concentration Process: HACH 8027 (Pyridine – Pyrazalone Method)
29	Chromium (Hexavalent)	ISO 11083:1994 (Determination of chromium (VI) Spectrometric method using 1,5-diphenylcarbazide)
30	Fluoride	APHA 4110 B (Ion Chromatography with Chemical Suppression of Eluent Conductivity)
31	Free Chlorine	APHA 4500-CL G (DPD Colorimetric Method)
32	Total Residual Chlorine	APHA 4500-CL G (DPD Colorimetric Method)
33	Sulphide	HACH 8131 (USEPA Methylene Blue Method)
34	Formaldehyde	HACH 8110 (MBTH Method)
35	Phenols	USEPA Method 420.1 (Phenolics (Spectrophotometric, Manual 4-AAP With Distillation))
36	Escherichia Coli	APHA 9221 F (Escherichia Coli Procedure Using Fluorogenic Substrate)
37	Flow Rate	Detection of Electromagnetic Elements (Real-time measurement by AEM 213-D Digital Current Meters)

Source: Myanmar Koei International Ltd.

2.4 Monitoring Period

Water quality and water flow rate monitoring were conducted on 5 June 2024, and sampling time is shown in Table 2.4-1 to avoid tidal effect. The tide record for Yangon River, Myanmar 5 June 2024 is shown in Table 2.4-2.

Table 2.4-1 Sampling Time of Each Point

No.	Station	Sampling Time
1	SW-2	05/06/2024 08:29
2	SW-4	05/06/2024 09:02
3	SW-7	05/06/2024 09:43
4	SW-8	05/06/2024 10:03
5	GW-2	05/06/2024 08:05

Source: Myanmar Koei International Ltd.

Table 2.4-2 Tide Record for Yangon River, Myanmar

Date	Time	Height (m)	Tide Conditions
05/06/2024	03:19	5.46	High Tide
	10:32	0.99	Low Tide
	15:25	6.00	High Tide
	23:29	0.92	Low Tide

Source: Myanmar Port Authority, Tide Table for the Yangon River and Elephant Point, 2024.

2.5 Monitoring Results

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

2.5.1 Results of Discharged Point and Discharged Creek

As the comparison with the target value, the results of suspended solid (SS), total coliform and iron exceeded the limitations.

Result of Discharged Points

As for the result of SS, result at the main discharging point of Zone B (SW-7) before discharging to the creek, exceeded the limitation due to the surface water run-off from bare land in Zone B.

As for the results of total coliform of surface water, results at the main discharging point of Zone B (SW-7 and SW-8) before discharging to the creek, exceeded the limitation due to the expected reason that might be natural bacteria existed in all area of Zone B because the existing of various kinds of vegetation and aquatic animals, especially fecal contamination from the animals, and the contaminants from the surroundings into the retention pond may contain fecal matter and other pollutants, leading to increase coliform levels.

Since the composition of the total coliform include bacteria from natural origin, and total coliform do not affect human health directly, E. Coli analysis was carried out alternatively to identify the health impact by coliform bacteria. As for the result of E. Coli of surface water at the main discharging points of Zone B (SW-7 and SW-8), the result was within limitation. Therefore, although the limitation of total coliform was exceeded at the main discharging points of Zone B (SW-7 and SW-8) but it is considered that there is no significant impact on human health.

As for the result of iron, the result at the main discharging point of Zone B (SW-7) before discharging to the creek exceeded the limitation. The possible reasons may be due to the influence of natural origin (iron can reach out from soil by run-off). Surroundings of the Thilawa SEZ especially small hilly areas are mainly composed of iron rich soil (lateritic soil), and it can be transported to the low land area by strong wind. Moreover, iron remains in the natural environment for a long time. Table 2.5-1 shows the results of water quality of the main discharged point of Zone B (SW-7) and reference monitoring points (SW-2 and SW-4). Regarding SW-2 and SW-4, SS concentration are 30 mg/l and 70 mg/l, while iron concentration occurred 2.980 mg/l and 4.132 mg/l respectively. It can be clearly seen that the lower suspended solid concentrations generally have lower iron concentrations and higher suspended solid concentrations generally have higher iron concentrations.

Result of Reference Monitoring points (Discharged Creek)

As for the result of SS, result at the surface water monitoring point (SW-4) exceeded the limitations. The exceeded result for SS maybe due to two expected reasons; i) delivered from upstream area such as natural origin and wastewater from local industrial zone which is located outside of Thilawa SEZ, and ii) influence by water from the downstream of monitoring points due to backflow by tidal fluctuation along Shwe Pyauk creek.

As for the result of total coliform, results at surface water monitoring points (SW-2) and (SW-4) exceeded the limitation due to three expected reasons: i) the existing of various kinds of vegetation and aquatic animals, especially fecal contamination from the animals, ii) contaminants from the surroundings into the Shwe Pyauk creek may contain fecal matter and other pollutants, leading to increase coliform levels and iii) incoming tidal water can contain the fecal matter and delivered along Shwe Pyauk creek during flood tide.

As for the result of iron, the result at the monitoring point of surface water (SW-4) exceeded the limitation. The possible reason for exceeded value in surface water (SW-4) may be due to the influence of natural origin (iron can reach out from the soil by run-off). Surroundings of the Thilawa

SEZ especially small hilly areas are mainly composed of iron rich soil (lateritic soil), and it can be transported to the low land area by run-off or strong wind.

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

No.	Parameters	Unit	SW-2	SW-4	SW-7	SW-8	Target Value
1	Water Temperature	˚C	29	29	29	29	≤ 35
2	pH	-	6.0	6.2	6.5	6.7	6~9
3	Dissolved Oxygen (DO)	mg/l	3.12	3.33	3.23	3.32	-
4	Suspended Solid (SS)	mg/l	30	70	126	30	50
5	$BOD_{(5)}$	mg/l	15.67	13.35	8.19	4.13	30
6	$COD_{(Cr)}$	mg/l	31.3	29.9	19.5	12.4	125
7	Total Coliform	MPN/100ml	92000.0	35000.0	> 160000	92000.0	400
8	Oil and Grease	mg/l	< 3.1	< 3.1	< 3.1	< 3.1	10
9	Total Nitrogen (T-N)	mg/l	< 0.5	< 0.5	< 0.5	< 0.5	80
10	Total Phosphorous (T-P)	mg/l	0.22	0.22	0.29	0.10	2
11	Color	TCU (True Color Unit)	78.63	61.13	18.63	13.63	150
12	Odor	TON (Threshold Odor Number)	3	1	1	1	-
13	Ammonia	mg/l	0.03	0.05	0.15	0.06	10
14	Total Dissolved Solids	mg/l	122	124	172	150	2000
15	Mercury	mg/l	≤ 0.002	≤ 0.002	≤ 0.002	≤ 0.002	0.005
16	Zinc	mg/l	≤ 0.002	≤ 0.002	≤ 0.002	≤ 0.002	2
17	Arsenic	mg/l	≤ 0.010	≤ 0.010	≤ 0.010	≤ 0.010	0.1
18	Chromium	mg/l	≤ 0.002	≤ 0.002	≤ 0.002	≤ 0.002	0.5
19	Cadmium	mg/l	≤ 0.002	≤ 0.002	≤ 0.002	≤ 0.002	0.03
20	Selenium	mg/l	≤ 0.010	≤ 0.010	≤ 0.010	≤ 0.010	0.02
21	Lead	mg/l	≤ 0.002	≤ 0.002	≤ 0.002	≤ 0.002	0.1
22	Copper	mg/l	≤ 0.002	≤ 0.002	≤ 0.002	≤ 0.002	0.5
23	Barium	mg/l	0.020	0.022	0.032	0.014	1
24	Nickel	mg/l	≤ 0.002	≤ 0.002	≤ 0.002	≤ 0.002	0.2
25	Silver	mg/l	≤ 0.002	≤ 0.002	≤ 0.002	≤ 0.002	0.5
26	Iron	mg/l	2.980	4.132	5.720	1.956	3.5
27	Cyanide	mg/l	< 0.002	< 0.002	< 0.002	< 0.002	0.1
28	Total Cyanide	mg/l	0.002	0.002	0.002	0.002	1
29	Chromium (Hexavalent)	mg/l	< 0.05	< 0.05	< 0.05	< 0.05	0.1
30	Fluoride	mg/l	0.027	0.039	0.064	0.095	20
31	Free Chlorine	mg/l	< 0.1	< 0.1	< 0.1	< 0.1	1
32	Total Residual Chlorine	mg/l	0.1	0.1	0.1	0.1	0.2
33	Sulphide	mg/l	0.059	0.077	0.281	0.113	1
34	Formaldehyde	mg/l	0.070	0.069	0.188	0.080	1
35	Phenols	mg/l	0.015	0.018	< 0.002	0.007	0.5
36	Escherichia Coli	MPN/100ml	-	-	12.0	2.0	(1000)* (CFU/100ml)
37	Flow Rate	m^3/s	0.11	0.43	-	-	-

Note: Red color means exceeded value than target value.

*Note: Based on the water utilization at discharged creek, the 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 Result of Reference Tube Well

Result of water quality monitoring at reference tube well monitoring point is shown in Table 2.5-2. As the comparison with the target value, the result of total coliform, iron and phenols exceeded the limitation.

For the ground water quality, National Technical Regulation on Ground Water Quality (No. QCVN 09-MT: 2015/BTNMT) in Vietnam is used as a reference because Myanmar does not have any ground water guidelines and standards, and most of the analyzed parameter are included in Vietnam standard rather the those stipulated by neighboring countries. For the result of Escherichia Coli, B1 (Irrigation water) of National Technical Regulation on Surface Water Quality (No. QCVN 08-MT: 2015/BTNMT) in Vietnam is referred, as no standard for E.coli is mentioned in Vietnam ground water regulation.as a reference. In addition, the target values of effluent water quality discharging to water body stipulated in the EIA report are also considered for comparison with ground water quality.

As for the result of total coliform in ground water, results at (GW-2) exceeded the limitation of Vietnam Standard. However, total coliform result was within the limitation prescribed in the EIA report of Thilawa SEZ. It may be due to the poor maintenance of well which can increase the risk of bacteria and other harmful organisms. According to the information by monastery, the depth of tube well (GW-2) is about 30 m. By referring the report "Data Collection Survey on Water Resources Potential for Thilawa SEZ and Adjoining Areas" prepared by JICA in 2014, the groundwater extracted at GW-2 is from the second aquifer, there is the intrusion of saline water from Yangon River. Moreover, this aquifer is closed to ground surface and overlain by the unconsolidated soil layer. Consequently, the groundwater in this aquifer may be contaminated in terms of saline water intrusion as well as seepage of contaminated runoff through overlaying soil layer. However, the result of E. Coli of (GW-2) was within the limitation. Therefore, although the limitation of total coliform exceeded at monitoring point of (GW-2), 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 reference tube well (GW-2) exceeded the limitation. Comparison with previous monitoring results of GW-2 since April 2019, the iron concentration results are ranging from 0.108 mg/l in April 2023 to 14.100 mg/l in December 2023 and most of the iron concentration results (from April 2019 to June 2024) exceeded the limitation except the results of August 2019, February and April 2022, and April 2023. Therefore, the possible reasons may due to the influence of natural origin (iron can reach out from soil by run-off). Moreover, Thilawa SEZ area is mainly composed of iron rich soil (lateritic soil), and it can be saturated in the underlying confined aquifer.

As for the result of phenols in ground water, results at (GW-2) exceeded the limitation of Vietnam Standard. However, phenols result was within the limitation prescribed in the EIA report of Thilawa SEZ. It may be due to the phenolic pollutants in the surrounding soil layer resulting from the remnants of coal tar, pesticides, fertilizers and other organic compound, can be dissolved into the groundwater aquifer. In addition, as phenolic compounds are components of many plant species, aquatic or terrestrial, those compounds in water are sometimes due to the decomposition of dead plants and animals in the water bodies or as a result of runoff from the land where the decomposing materials are washed into water bodies.

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

No.	Parameters	Unit	GW-2	Vietnam Ground Water Standard	Target Value
1	Water Temperature	°C	29	-	≤ 35
2	pH	-	6.6	5.5 – 8.5	6~9
3	Dissolved Oxygen (DO)	mg/l	8.41	-	-
4	Suspended Solid (SS)	mg/l	20	-	50
5	$BOD_{(5)}$	mg/l	25.31	-	30
6	$COD_{(Cr)}$	mg/l	55.6	-	125
7	Total Coliform	MPN/100ml	21.0	3	400
8	Oil and Grease	mg/l	< 3.1	-	10
9	Total Nitrogen (T-N)	mg/l	< 0.5	-	80
10	Total Phosphorous (T-P)	mg/l	0.64	-	2
11	Color	TCU (True Color Unit)	57.38	-	150
12	Odor	TON (Threshold Odo Number)	1	-	-
13	Ammonia	mg/l	< 0.02	-	10
14	Total Dissolved Solids	mg/l	198	1500	2000
15	Mercury	mg/l	≤ 0.002	0.001	0.005
16	Zinc	mg/l	≤ 0.002	3	2
17	Arsenic	mg/l	≤ 0.010	0.05	0.1
18	Chromium	mg/l	≤ 0.002	-	0.5
19	Cadmium	mg/l	≤ 0.002	0.005	0.03
20	Selenium	mg/l	≤ 0.010	0.01	0.02
21	Lead	mg/l	≤ 0.002	0.01	0.1
22	Copper	mg/l	≤ 0.002	-	0.5
23	Barium	mg/l	0.014	-	1
24	Nickel	mg/l	≤ 0.002	0.02	0.2
25	Silver	mg/l	≤ 0.002	-	0.5
26	Iron	mg/l	5.420	5	3.5
27	Cyanide	mg/l	< 0.002	0.01	0.1
28	Total Cyanide	mg/l	0.002	-	1
29	Chromium (Hexavalent)	mg/l	< 0.05	0.05	0.1
30	Fluoride	mg/l	0.110	-	20
31	Free Chlorine	mg/l	< 0.1	-	1
32	Total Residual Chlorine	mg/l	< 0.1	-	0.2
33	Sulphide	mg/l	0.012	-	1
34	Formaldehyde	mg/l	0.048	-	1
35	Phenols	mg/l	0.012	0.001	0.5
36	Escherichia Coli	MPN/100ml	< 1.8	(100)* (MPN/100ml)	(100)* (MPN/100ml)
37	Flow Rate	m^3/s	-		-

Note: Red color means the exceeded results than Vietnam Groundwater standards and target value.
Vietnam Groundwater Standard (No: QCVN 09-MT:2015/BTNMT)
*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-MT: 2015/BTNMT) is set as a reference value of self-monitoring for ground water monitoring.
Source: Myanmar Koei International Ltd.

2.5.3 Comparison of Results of Water Quality Exceed the Target Value between Previous Monitoring and June 2024 Monitoring

In order to overview the exceed the limitations of the concerned parameters during the present monitoring (June 2024), the results of the exceed parameters with respective sampling points are compared with the previous monitoring results since June 2023.

Regarding the results of the parameter of discharge point, suspended solid concentration at SW-7 is higher than the limitation in August, December 2023 and June 2024. Noticeably, suspended solid concentrations of SW-7 are higher during rainy season and winter season. Total coliform concentration at SW-7 is higher than the limitation in all monitoring surveys, ranging from 1400 MPN/100ml to the detection limit (>160000 MPN/100ml). Total coliform concentration at SW-7 is obviously reached to the detection limit in the beginning of rainy season, winter season and summer season and it might be the effect of storm water run-off but also by the fecal contaminates from the surroundings into the retention pond. Total coliform concentration at SW-8 is higher than the limitation in this time (June 2024) because this point is the first time monitoring at Zone B. The result of iron at SW-7 is higher than the limitation in December 2023 and February, April, June 2024. Noticeably, iron concentration of SW-7 are higher during winter season, summer season and early-rainy season. As for the total coliform result at GW-2, the values are higher than the limitation except August, October and December 2023. It is clear that total coliform concentrations at GW-2 are higher during dry season (February and April 2024) and early rainy season (June 2023 and June 2024). Moreover, iron concentration at GW-2 is always higher than the limitation in all monitoring surveys. It is observed that iron concentration at GW-2 is higher throughout all three seasons. In addition, Phenols concentration at GW-2 is higher than the limitation in this time (June 2024). It is revealed that high concentration of phenols at (GW-2) occurred in rainy season.

On the other hand, it is observed that the results of SS concentration, at the reference monitoring point (SW-4) is higher than the limitation. As for the results of SS concentration, the result of SW-4 is higher throughout all three seasons, ranging from 70 to 528 mg/l. It is assumed that SS concentrations at (SW-4) are higher during all three seasons due to the agricultural and domestic run-off from the surrounding as well as the tidal effect resulting the cloudiness (turbidity) of water along Shwe Pyauk creek during both seasons. It is obvious that total coliform at both SW-2 and SW-4 is higher in all monitoring surveys, ranging from 24000 to >160000 MPN/100ml for SW-2 and from 14000 to >160000 MPN/100ml for SW-4, respectively. Especially the total coliform amounts at SW-2 and SW-4 were reached to the detection limit (>160000 MPN/100ml) in June 2023 and February, April 2024. The results of iron at (SW-4) are also higher than the limitation in all monitoring surveys (June, August, October, December 2023 and February, April, June 2024) ranging from 4.132 to 24.000 mg/l. It is revealed that high concentration of iron at (SW-4) occurred throughout all three seasons. It is possible to say that the present condition of the water quality reflects the background condition of the surrounding environment of Thilawa SEZ.

The expected reasons for the results exceed the limitation of concerned parameters are discussed in the upper section of this monitoring report.

CHAPTER 3: CONCLUSION AND RECOMMENDATIONS

As described in Chapter 2 (Section 2.5), the results of suspended solid (SS) at (SW-4 and SW-7), total coliform at (SW-2, SW-4, SW-7 and SW-8), and iron at (SW-4 and SW-7) in surface water, and the result of total coliform, iron and phenols at (GW-2) in ground water exceeded the limitation in this monitoring period for operation stage of Thilawa SEZ Zone B.

As for the result of SS, result at the main discharging point of Zone B (SW-7) before discharging to the creek, exceeded the limitation due to the surface water run-off from bare land in Zone B.

As for the results of total coliform of surface water, results at the main discharging point of (SW-7 and SW-8) before discharging to the creek, exceeded the limitation due to the expected reason that might be natural bacteria existed in all area of Zone B because the existing of various kinds of vegetation and aquatic animals, especially fecal contamination from the animals, and the contaminants from the surroundings into the retention pond may contain fecal matter and other pollutants, leading to increase coliform levels.

Since the composition of the total coliform include bacteria from natural origin, and total coliform do not affect human health directly, E. Coli analysis was carried out alternatively to identify the health impact by coliform bacteria. As for the result of E. Coli of surface water at the main discharging points of Zone B (SW-7 and SW-8), the result was within limitation. Therefore, although the limitation of total coliform was exceeded at the main discharging points of Zone B (SW-7 and SW-8) but it is considered that there is no significant impact on human health.

As for the result of iron, the result at the main discharging point of Zone B (SW-7) before discharging to the creek exceeded the limitation. The possible reasons may be due to the influence of natural origin (iron can reach out from soil by run-off). Surroundings of the Thilawa SEZ especially small hilly areas are mainly composed of iron rich soil (lateritic soil), and it can be transported to the low land area by strong wind. Moreover, iron remains in the natural environment for a long time. Regarding SW-2 and SW-4, SS concentration are 30 mg/l and 70 mg/l, while iron concentration occurred 2.980 mg/l and 4.132 mg/l respectively. It can be clearly seen that the lower suspended solid concentrations generally have lower iron concentrations and higher suspended solid concentrations generally have higher iron concentrations.

As for parameters of SS, total coliform and iron in surface water exceeded the limitation at reference monitoring points. The exceeded result of SS at (SW-4) maybe due to two expected reasons; i) delivered from upstream area such as natural origin and wastewater from local industrial zone which is located outside of Thilawa SEZ, and ii) influence by water from the downstream of monitoring points due to backflow by tidal fluctuation along Shwe Pyauk creek.

The exceeded results for total coliform at (SW-2) and (SW-4) may be due to three expected reasons: i) the existing of various kinds of vegetation and aquatic animals, especially fecal contamination from the animals, ii) contaminants from the surroundings into the Shwe Pyauk creek may contain fecal matter and other pollutants, leading to increase coliform levels and iii) incoming tidal water can contain the fecal matter and delivered along Shwe Pyauk creek during flood tide.

The expected reason for exceeding the limitation of iron at reference monitoring points (SW-4) may be due to the influence of natural origin (iron can reach out from the soil by run-off). Surroundings of the Thilawa SEZ especially small hilly areas are mainly composed of iron rich soil (lateritic soil), and it can be transported to the low land area by run-off or strong wind.

As for the result of total coliform in ground water, results at (GW-2) exceeded the limitation of Vietnam Standard. However, total coliform result was within the limitation prescribed in the EIA report of Thilawa SEZ. It may be due to the poor maintenance of well which can increase the risk of bacteria and other harmful organisms. According to the information by monastery, the depth of tube well (GW-2) is about 30 m. By referring the report "Data Collection Survey on Water Resources Potential for Thilawa SEZ and Adjoining Areas" prepared by JICA in 2014, the groundwater extracted at GW-2 is from the second aquifer, there is the intrusion of saline water from Yangon River. Moreover, this aquifer is closed to ground surface and overlain by the unconsolidated soil layer. Consequently, the

groundwater in this aquifer may be contaminated in terms of saline water intrusion as well as seepage of contaminated runoff through overlaying soil layer. However, the result of E. Coli of (GW-2) was within the limitation. Therefore, although the limitation of total coliform exceeded at monitoring point of (GW-2), 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 reference tube well (GW-2) exceeded the limitation. Comparison with previous monitoring results of GW-2 since April 2019, the iron concentration results are ranging from 0.108 mg/l in April 2023 to 14.100 mg/l in December 2023 and most of the iron concentration results (from April 2019 to June 2024) exceeded the limitation except the results of August 2019, February and April 2022, and April 2023. Therefore, the possible reasons may due to the influence of natural origin (iron can reach out from soil by run-off). Moreover, Thilawa SEZ area is mainly composed of iron rich soil (lateritic soil), and it can be saturated in the underlying confined aquifer.

As for the result of phenols in ground water, results at (GW-2) exceeded the limitation. However, phenols result was within the limitation prescrived in the EIA report of Thilawa SEZ. It may be due to the phenolic pollutants in the surrounding soil layer, resulting from the remnants of coal tar, pesticides, fertilizers and other organic compound, can be dissolved into the groundwater aquifer. In addition, as phenolic compounds are components of many plant species, aquatic or terrestrial, those compounds in water are sometimes due to the decomposition of dead plants and animals in the water bodies or as a result of runoff from the land where the decomposing materials are washed into water bodies.

As for future subject for main discharged points of Thilawa SEZ Zone B, the following action may be taken to maintain the limitation of suspended solid, total coliform and iron and appropriate water quality monitoring:

- To continue monitoring Escherichia coli (E. coli) level to identify health impact by coliform bacteria.
- To monitor the possibility of the domestic wastewater from the factories.

End of the Document

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APPENDIX-1 FIELD SURVEY PHOTOS

FOR DISCHARGED POINT OF THILAWA SEZ ZONE B

Surface water sampling and onsite measurement at SW-7

Surface water sampling and onsite measurement at SW-8

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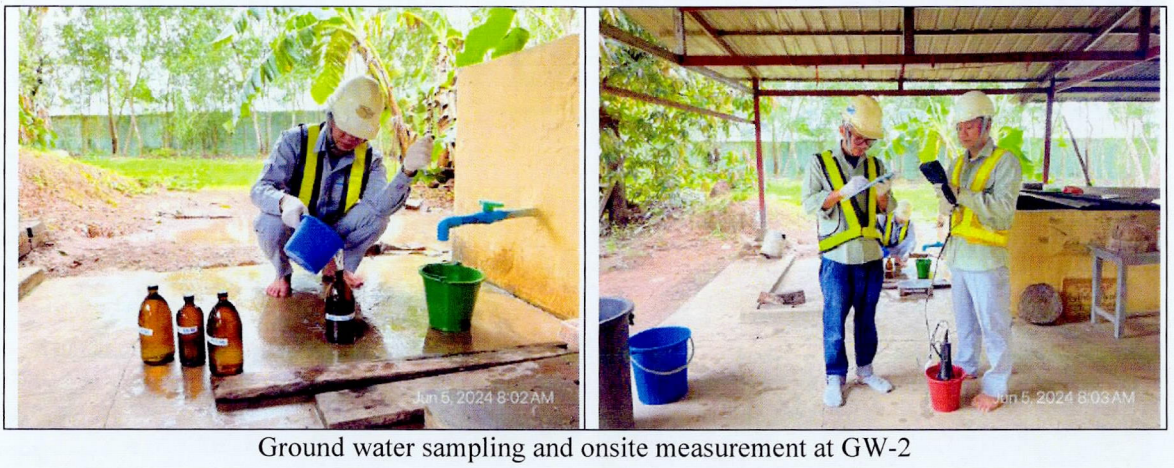
FOR REFERENCE MONITORING POINTS FOR COMPARISON WITH DISCHARGED POINTS AND BASELINE OF DISCHARGED CREEK

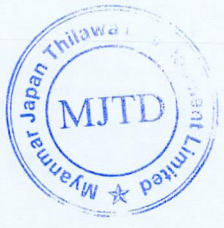
Surface water sampling and onsite measurement at SW-2

Surface water sampling and onsite measurement at SW-4



Ground water sampling and onsite measurement at GW-2

APPENDIX-2 LABORATORY RESULTS



FOR DISCHARGED POINT

DOWA

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Report No. : GEM-LAB-202406078
Revision No. : 1
Report Date : 20 June, 2024
Application No. : 0001-C001

Test 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-7-0605
Sample No. : W-2406057
Waste Profile No : -

Sampling Date : 5 June, 2024
Sampling By : Withdraw GEM
Sample Received Date : 5 June, 2024
Analytical Date : 5-20/06/2024

No.	Parameter	Method	Unit	Result	TSEZ's WQ Standard	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	126	50	_
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	8.19	30	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	19.5	125	0.7
4	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	>160000	400	1.8
5	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	<3.1	10	3.1
6	Color	APHA 2120C (Spectrophotometric Method)	TCU	18.63	150	0.00
7	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	<0.5	80	0.5
8	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.29	2	0.05
9	Ammonia	HACH Method 10205 (Silicylate TNT Plus Method)	mg/l	0.15	10	0.02
10	TDS	APHA 2540 C (Total Dissolved Solids Dried at 180'C Method)	mg/l	172	2000	_
11	Odor	APHA 2150 B (Threshold Odor Test)	TON	1	_	0
12	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.005	0.002
13	Zinc	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	2	0.002
14	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.010	0.1	0.010
15	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.5	0.002
16	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.03	0.002
17	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.010	0.02	0.010
18	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.1	0.002
19	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.5	0.002
20	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.032	1	0.002

LAB GEM

REPORT RESULT IS ONLY OF THE SAMPLE SUBMITTED FOR ANALYSIS
THIS ANALYSIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THE LABORATORY OF GOLDEN DOWA ECO-SYSTEM MYANMAR CO.,LTD

Myanmar Japan Thilawa Development Limited MJTD

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No.	Parameter	Method	Unit	Result	TSEZ's WQ Standard	LOQ
21	Nickel	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.2	0.002
22	Silver	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.5	0.002
23	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	5.720	3.5	0.002
24	Cyanide	HACH 8027 (Pyridine -Pyrazalone Method)	mg/l	<0.002	0.1	0.002
25	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	1	0.002
26	Hexavalent Chromium (Cr6+)	ISO 11083:1994 (Determination of chromium(VI) Spectrometric method using 1,5-diphenylcarbazide)	mg/l	<0.05	0.1	0.05
27	Fluoride	APHA 4110 B (Ion Chromatography with Chemical Suppression of Eluent Conductivity)	mg/l	0.064	20	0.014
28	Free Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	<0.1	1	0.1
29	Total Residual Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	0.1	0.2	0.1
30	Sulphide	HACH 8131 (USEPA Methylene Blue Method)	mg/l	0.281	1	0.005
31	Formaldehyde	HACH 8110 (MBTH Method)	mg/l	0.188	1	0.003
32	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	12.0	_	1.8
33	Phenols	USEPA Method 420.1 (Phenolics (Spectrophotometric, Manual 4AAP With Distillation))	mg/l	<0.002	0.5	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

APHA 2120B.6(b); Color Unit - TCU(True Color Unit).
One TCU is equivalent to one Hazen unit and to one Pt-Co unit.

Analysed By :

Cherry Myint Thein
Assistant Manager

LAB
June 20,2024
GEM

Approved By :

Ni Ni Aye Lwin June 20,2024
Manager

*** End of Document ***

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DOWA

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Report No. : GEM-LAB-202406079
Revision No. : 1
Report Date : 20 June, 2024
Application No. : 0001-C001

Test 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-8-0605
Sample No. : W-2406058
Waste Profile No : -

Sampling Date : 5 June, 2024
Sampling By : Withdraw GEM
Sample Received Date : 5 June, 2024
Analytical Date : 5-20/06/2024

No.	Parameter	Method	Unit	Result	TSEZ's WQ Standard	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	30	50	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	4.13	30	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	12.4	125	0.7
4	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	92000.0	400	1.8
5	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	<3.1	10	3.1
6	Color	APHA 2120C (Spectrophotometric Method)	TCU	13.63	150	0.00
7	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	<0.5	80	0.5
8	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.10	2	0.05
9	Ammonia	HACH Method 10205 (Silicylate TNT Plus Method)	mg/l	0.06	10	0.02
10	TDS	APHA 2540 C (Total Dissolved Solids Dried at 180'C Method)	mg/l	150	2000	-
11	Odor	APHA 2150 B (Threshold Odor Test)	TON	1	-	0
12	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.005	0.002
13	Zinc	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	2	0.002
14	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.010	0.1	0.010
15	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.5	0.002
16	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.03	0.002
17	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.010	0.02	0.010
18	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.1	0.002
19	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.5	0.002
20	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.014	1	0.002

LAB GEM

Japan Thilawa Development Limited MJTD Myanmar

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Doc No: GEM-LE-R006E/01/AD
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No.	Parameter	Method	Unit	Result	TSEZ's WQ Standard	LOQ
21	Nickel	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.2	0.002
22	Silver	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.5	0.002
23	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	1.956	3.5	0.002
24	Cyanide	HACH 8027 (Pyridine -Pyrazalone Method)	mg/l	<0.002	0.1	0.002
25	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	1	0.002
26	Hexavalent Chromium (Cr6+)	ISO 11083:1994 (Determination of chromium(VI) Spectrometric method using 1,5-diphenylcarbazide)	mg/l	<0.05	0.1	0.05
27	Fluoride	APHA 4110 B (Ion Chromatography with Chemical Suppression of Eluent Conductivity)	mg/l	0.095	20	0.014
28	Free Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	<0.1	1	0.1
29	Total Residual Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	0.1	0.2	0.1
30	Sulphide	HACH 8131 (USEPA Methylene Blue Method)	mg/l	0.113	1	0.005
31	Formaldehyde	HACH 8110 (MBTH Method)	mg/l	0.080	1	0.003
32	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	2.0	_	1.8
33	Phenols	USEPA Method 420.1 (Phenolics (Spectrophotometric, Manual 4AAP With Distillation))	mg/l	0.007	0.5	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

APHA 2120B.6(b); Color Unit - TCU(True Color Unit).
One TCU is equivalent to one Hazen unit and to one Pt-Co unit.

Analysed By :

Cherry Myint Thein
Assistant Manager

LAB GEM June 20, 2024

Approved By :

Ni Ni Aye Lwin June 20, 2024
Manager

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Japan Thilawa Development Limited Myanmar MJTD

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

DOWA
GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD.
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Phone No. Fax No: (+95) 1 2309051

Report No. GEM-LAB-202406075
Revision No. 1
Report Date 20 June, 2024
Application No. 0001-C001

Test 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-2-0605 Sampling Date : 5 June, 2023
Sample No. : W-2406054 Sampling By : Withdraw GEM
Waste Profile No. : - Sample Received Date : 5 June, 2023
Analytical Date : 5-20/06/2023

No.	Parameter	Method	Unit	Result	TSEZ's WQ Standard	LOQ
1	SS	APHA 2540D (Dry at 103-105°C Method)	mg/l	30	50	_
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	15.67	30	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	31.3	125	0.7
4	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	92000.0	400	1.8
5	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	<3.1	10	3.1
6	Color	APHA 2120C (Spectrophotometric Method)	TCU	78.63	150	0.00
7	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	<0.5	80	0.5
8	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.22	2	0.05
9	Ammonia	HACH Method 10205 (Silicylate TNT Plus Method)	mg/l	0.03	10	0.02
10	TDS	APHA 2540 C (Total Dissolved Solids Dried at 180°C Method)	mg/l	122	2000	_
11	Odor	APHA 2150 B (Threshold Odor Test)	TON	3	_	0
12	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.005	0.002
13	Zinc	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	2	0.002
14	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.010	0.1	0.010
15	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.5	0.002
16	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.03	0.002
17	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.010	0.02	0.01
18	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.1	0.002
19	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.5	0.002
20	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.020	1	0.002

LAB GEM

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No.	Parameter	Method	Unit	Result	TSEZ's WQ Standard	LOQ
21	Nickel	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.2	0.002
22	Silver	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.5	0.002
23	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	2.980	3.5	0.002
24	Cyanide	HACH 8027 (Pyridine -Pyrazalone Method)	mg/l	<0.002	0.1	0.002
25	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	1	0.002
26	Hexavalent Chromium (Cr6+)	ISO 11083:1994 (Determination of chromium(VI) Spectrometric method using 1,5-diphenylcarbazide)	mg/l	<0.05	0.1	0.05
27	Fluoride	APHA 4110 B (Ion Chromatography with Chemical Suppression of Eluent Conductivity)	mg/l	0.027	20	0.014
28	Free Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	<0.1	1	0.1
29	Total Residual Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	0.1	0.2	0.1
30	Sulphide	HACH 8131 (USEPA Methylene Blue Method)	mg/l	0.059	1	0.005
31	Formaldehyde	HACH 8110 (MBTH Method)	mg/l	0.070	1	0.003
32	Phenols	USEPA Method 420.1 (Phenolics (Spectrophotometric, Manual 4AAP With Distillation))	mg/l	0.015	0.5	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

APHA 2120B.6(b); Color Unit - TCU(True Color Unit).
One TCU is equivalent to one Hazen unit and to one Pt-Co unit.

Analysed By :

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June 20, 2024
GEM

Cherry Myint Thein
Assistant Manager

Approved by

Ni Ni Aye Lwin June 20, 2024
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Report No. : GEM-LAB-202406076
Revision No. : 1
Report Date : 20 June, 2024
Application No. : 0001-C001

Test 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-4-0605
Sample No. : W-2406055
Waste Profile N : -

Sampling Date : 5 June, 2024
Sampling By : Withdraw GEM
Sample Received Date : 5 June, 2024
Analytical Date : 5-20/06/2024

No.	Parameter	Method	Unit	Result	TSEZ's WQ Standard	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	70	50	_
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	13.35	30	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	29.9	125	0.7
4	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	35000.0	400	1.8
5	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	<3.1	10	3.1
6	Color	APHA 2120C (Spectrophotometric Method)	TCU	61.13	150	0.00
7	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	<0.5	80	0.5
8	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.22	2	0.05
9	Ammonia	HACH Method 10205 (Silicylate TNT Plus Method)	mg/l	0.05	10	0.02
10	TDS	APHA 2540 C (Total Dissolved Solids Dried at 180'C Method)	mg/l	124	2000	_
11	Odor	APHA 2150 B (Threshold Odor Test)	TON	1	_	0
12	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.005	0.002
13	Zinc	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	2	0.002
14	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.010	0.1	0.010
15	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.5	0.002
16	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.03	0.002
17	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.010	0.02	0.01
18	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.1	0.002
19	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.5	0.002
20	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.022	1	0.002

LAB GEM
REPORT RESULT IS ONLY OF THE SAMPLE SUBMITTED FOR ANALYSIS
THIS ANALYSIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT WRITTEN APPROVAL OF THE LABORATORY OF GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD.

Myanmar Japan Thilawa Development Limited MJTD

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Wastewater our planet
Doc No: GEM-LB-R001/01/AE
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No.	Parameter	Method	Unit	Result	TSEZ's WQ Standard	LOQ
21	Nickel	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.2	0.002
22	Silver	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.5	0.002
23	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	4.132	3.5	0.002
24	Cyanide	HACH 8027 (Pyridine -Pyrazalone Method)	mg/l	<0.002	0.1	0.002
25	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	1	0.002
26	Hexavalent Chromium (Cr6+)	ISO 11083:1994 (Determination of chromium(VI) Spectrometric method using 1,5-diphenylcarbazide)	mg/l	<0.05	0.1	0.05
27	Fluoride	APHA 4110 B (Ion Chromatography with Chemical Suppression of Eluent Conductivity)	mg/l	0.039	20	0.014
28	Free Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	<0.1	1	0.1
29	Total Residual Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	0.1	0.2	0.1
30	Sulphide	HACH 8131 (USEPA Methylene Blue Method)	mg/l	0.077	1	0.005
31	Formaldehyde	HACH 8110 (MBTH Method)	mg/l	0.069	1	0.003
32	Phenols	USEPA Method 420.1 (Phenolics (Spectrophotometric, Manual 4AAP With Distillation))	mg/l	0.018	0.5	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

APHA 2120B.6(b); Color Unit - TCU(True Color Unit).
One TCU is equivalent to one Hazen unit and to one Pt-Co unit.

Analysed By :

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June 20, 2024
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Cherry Myint Thein
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Approved by

Ni Ni Aye Lwin June 20, 2024
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Report No. : GEM-LAB-202406080
Revision No. : 1
Report Date : 20 June, 2024
Application No. : 0001-C001

Test 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-2-0605
Sample No. : W-2406059
Waste Profile No. : -
Sampling Date : 5 June, 2024
Sampling By : Withdraw GEM
Sample Received Date : 5 June, 2024
Analytical Date : 5-20/06/2024

No.	Parameter	Method	Unit	Result	TSEZ's WQ Standard	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	20	50	_
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	25.31	30	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	55.6	125	0.7
4	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	21.0	400	1.8
5	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	<3.1	10	3.1
6	Color	APHA 2120C (Spectrophotometric Method)	TCU	57.38	150	0.00
7	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	<0.5	80	0.5
8	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.64	2	0.05
9	Ammonia	HACH Method 10205 (Silicylate TNT Plus Method)	mg/l	<0.02	10	0.02
10	TDS	APHA 2540 C (Total Dissolved Solids Dried at 180'C Method)	mg/l	198	2000	_
11	Odor	APHA 2150 B (Threshold Odor Test)	TON	1	_	0
12	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.005	0.002
13	Zinc	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	2	0.002
14	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.010	0.1	0.010
15	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.5	0.002
16	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.03	0.002
17	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.010	0.02	0.010
18	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.1	0.002
19	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.5	0.002
20	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.014	1	0.002

LAB GEM
REPORT RESULT IS ONLY OF THE SAMPLE SUBMITTED FOR ANALYSIS
THIS ANALYSIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL, WITHOUT WRITTEN APPROVAL OF THE LABORATORY OF GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD.

Japan Thilawa Development Limited Myanmar MJTD

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Phone No. Fax No. (+951) 2309051

No.	Parameter	Method	Unit	Result	TSEZ's WQ Standard	LOQ
21	Nickel	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.2	0.002
22	Silver	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤0.002	0.5	0.002
23	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	5.420	3.5	0.002
24	Cyanide	HACH 8027 (Pyridine -Pyrazalone Method)	mg/l	<0.002	0.1	0.002
25	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	1	0.002
26	Hexavalent Chromium (Cr6+)	ISO 11083:1994 (Determination of chromium(VI) Spectrometric method using 1,5-diphenylcarbazide)	mg/l	<0.05	0.1	0.05
27	Fluoride	APHA 4110 B (Ion Chromatography with Chemical Suppression of Eluent Conductivity)	mg/l	0.110	20	0.014
28	Free Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	<0.1	1	0.1
29	Total Residual Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	<0.1	0.2	0.1
30	Sulphide	HACH 8131 (USEPA Methylene Blue Method)	mg/l	0.012	1	0.005
31	Formaldehyde	HACH 8110 (MBTH Method)	mg/l	0.048	1	0.003
32	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	<1.8	_	1.8
33	Phenols	USEPA Method 420.1 (Phenolics (Spectrophotometric, Manual 4AAP With Distillation))	mg/l	0.012	0.5	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

APHA 2120B.6(b); Color Unit - TCU(True Color Unit).
One TCU is equivalent to one Hazen unit and to one Pt-Co unit.

Analysed By :

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June 20, 2024
GEM

Cherry Myint Thein
Assistant Manager

Approved By :

Ni Ni Aye Lwin June 20, 2024
Manager

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Japan Thilawa Development Myanmar Limited
MJTD

Thilawa Special Economic Zone

Zone B– Phase 1,2 & 3 (Operation phase)

Appendix-D

Air Quality Monitoring Report

June 2024

AIR QUALITY MONITORING REPORT FOR DEVELOPMENT OF INDUSTRIAL AREA THILAWA SEZ ZONE B (PHASE 1, 2 & 3 OPERATION STAGE)

(BI-ANNUALLY MONITORING)

June 2024

Myanmar Koei International Ltd.

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CHAPTER 1: OUTLINES AND SUMMARY OF MONITORING PLAN

1.1 General

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

1.2 Outlines of Monitoring Plan

To assess the environmental condition under the operation of industrial area in and around Thilawa SEZ Zone B, air quality had been monitored from 3 June 2024 to 10 June 2024 as follows;

Table 1.2-1 Outlines of Air Quality Monitoring Plan

Monitoring Date	Monitoring Item	Parameters	Number of Point	Duration	Monitoring Methodology
From 3 June to 10 June, 2024	Air Quality	CO, NO_2, $PM_{2.5}$, PM_{10} and SO_2	1	7 Days	On site measurement by Haz-Scanner Environmental Perimeter Air Station (EPAS)

Source: Myanmar Koei International Ltd.

CHAPTER 2: AIR QUALITY MONITORING

2.1 Monitoring Item

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

2.2 Monitoring Location

The air quality measurement equipment, "Haz-Scanner Environmental Perimeter Air Station (EPAS) was set up at the south of the Thilawa SEZ Zone B, N: 16°39'24.20", E: 96°17'15.80", inside the monastery compound of Phalan village. As the monitoring point (AQ-1) is adjacent to the southern boundary of Thilawa SEZ Zone B, it is surrounded by Thilawa SEZ Zone B in the north and east. In the south and west of AQ-1, the residential houses of Phalan village and the fields are located respectively. Besides, Thilawa SEZ Zone A is distanced about 2 km north of AQ-1 as well as the local Thilawa Industrial Zone is about 1 km northeast. Due to the air quality monitoring is carried out at above location which is closed to the residential houses of Phalan village, the possible emission sources are exhaust gas and dust emissions from the fuel-burning equipment and other tasks of construction activities of Zone B but also from the daily human activities in Phalan village. The location of air quality monitoring point is shown in the Figure 2.2-1.

Source: Google Earth

Figure 2.2-1 Location of Air Quality Monitoring Point

2.3 Monitoring Period

Air quality monitoring was conducted seven consecutive days from 3 June, 2024 to 10 June, 2024.

2.4 Monitoring Method

Monitoring of CO, NO_2, $PM_{2.5}$, PM_{10} and SO_2 were conducted by referring to the recommendation of the United States Environmental Protection Agency (U.S. EPA). The Haz-Scanner EPAS was used to collect ambient air pollutants. The EPAS measures automatically every one minute and directly reads and records onsite for CO, NO_2, $PM_{2.5}$, PM_{10} and SO_2. Wind data are analyzed by using the WRPLOT View (Ver. 8.0.2), in which calm wind is defined below 0.5 m/s. The status 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, $PM_{2.5}$, PM_{10} and SO_2 are described in Table 2.5-1. Comparing with the target value of CO, NO_2, $PM_{2.5}$, PM_{10} and SO_2 prescribed in EIA report for Thilawa SEZ development project Zone B, seven days average concentration of CO, NO_2, $PM_{2.5}$, PM_{10} and SO_2 were within limitations.

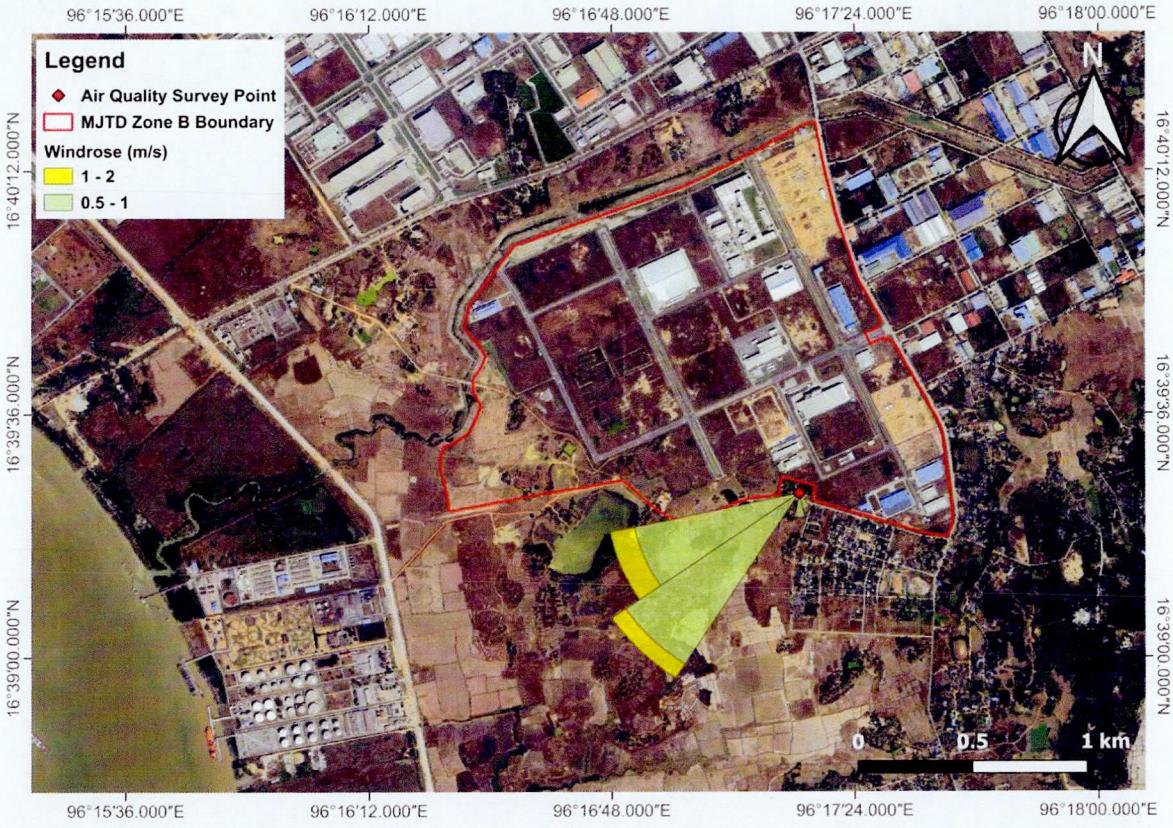
Table 2.5-1 Air Quality Monitoring Result (Daily Average)

Date	CO	NO_2	$PM_{2.5}$	PM_{10}	SO_2
	mg/m³	mg/m³	mg/m³	mg/m³	mg/m³
03~04 June, 2024	0.092	0.047	0.012	0.031	0.011
04~05 June, 2024	0.050	0.033	0.005	0.011	0.008
05~06 June, 2024	0.041	0.025	0.005	0.010	0.007
06~07 June, 2024	0.049	0.031	0.012	0.028	0.009
07~08 June, 2024	0.069	0.021	0.008	0.017	0.011
08~09 June, 2024	0.197	0.023	0.012	0.021	0.015
09~10 June, 2024	0.041	0.021	0.008	0.013	0.013
7 Days Average Value	0.077	0.029	0.009	0.019	0.011
Target Value	10.26	0.1	0.025	0.05	0.02

Note: The target value of CO, NO_2 and SO_2 were converted from ppm units to mg/m³. The conversion equation are as follows;
1. (CO, mg/m³) = (CO, ppm) * (Molecular Weight of CO (28)) / 24.45 at 25°C and 1 atm condition
2. (NO_2, mg/m³) = (NO_2, ppm) * (Molecular Weight of NO_2 (46)) / 24.45 at 25°C and 1 atm condition
3. (SO_2, mg/m³) = (SO_2, ppm) * (Molecular Weight of SO_2 (64)) / 24.45 at 25°C and 1 atm condition

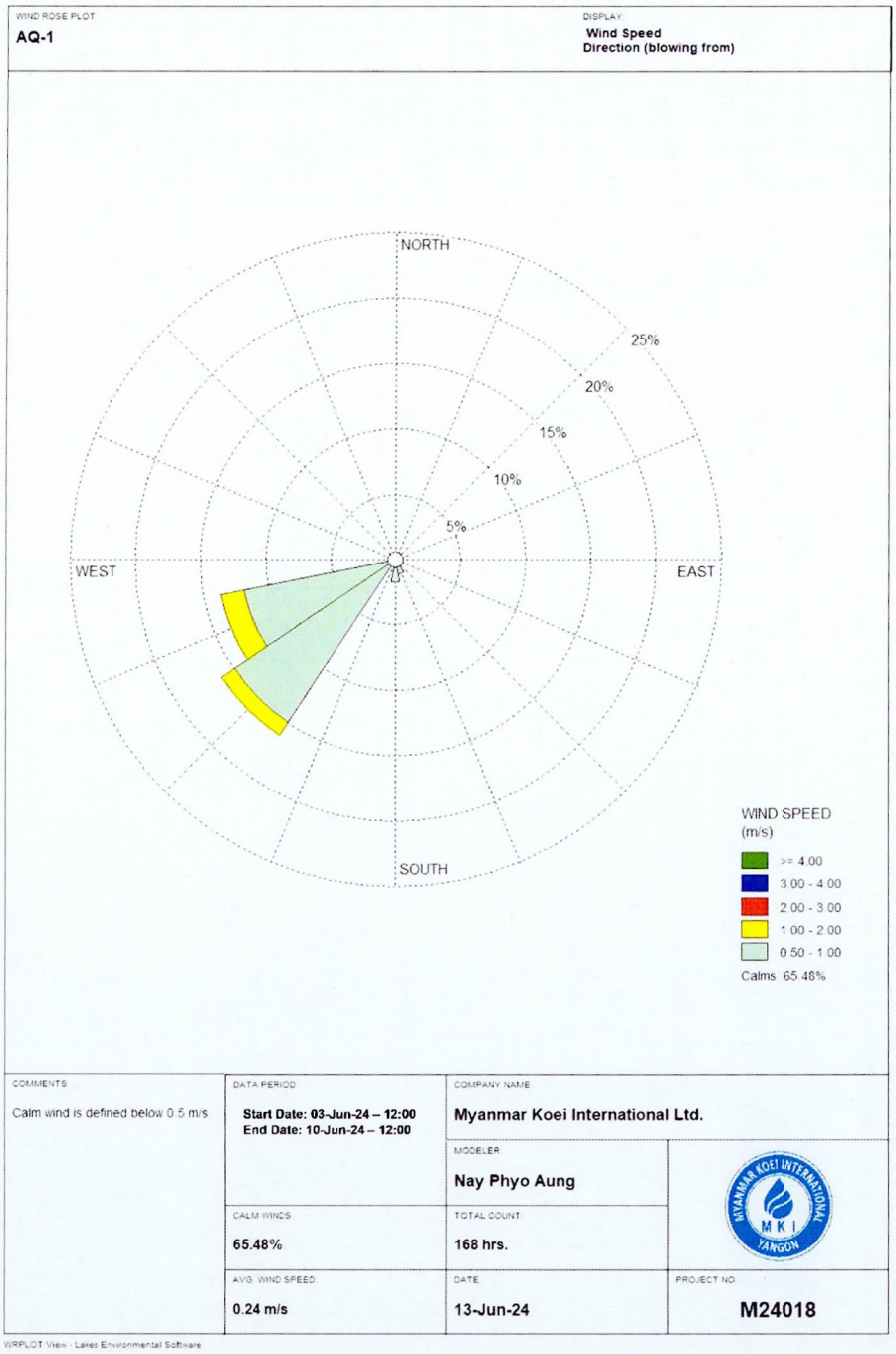
Source: Myanmar Koei International Ltd.

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. Frequency of wind direction at AQ-1 and its wind rose diagram are described in Figure 2.5-1 and Figure 2.5-2. According to the wind rose analysis, the prevailing wind direction during monitoring was Southwest (SW) and the least frequency wind direction was West-Southwest (WSW). During the monitoring period, while the maximum wind speed was 1.45 m/s, the average speed is 0.24 m/s. The calm wind is 65.48%, whereas the calm wind is defined below 0.5 m/s. As the average wind speed is lower than the defined calm wind, it is assumed that the wind was calm during the monitoring period.



Source: Myanmar Koei International Ltd.

Figure 2.5-1 Wind Status at AQ-1



Note: The data in which wind speed < 0.5 m/s is not considered or counted in this modelling.
Source: Myanmar Koei International Ltd.

Figure 2.5-2 Wind Rose Diagram of AQ-1

CHAPTER 3: CONCLUSION AND RECOMMENDATION

The result of seven days average air quality of CO, NO_2, $PM_{2.5}$, PM_{10} and SO_2 during seven days monitoring did not exceed limitation, thus there are no impacts on the surrounding environments.

The periodical monitoring will be necessary to grasp the environmental conditions in operation stage of Thilawa SEZ Zone B. 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 RESULTS

Date	Time	CO	NO_2	$PM_{2.5}$	PM_{10}	SO_2	Wind Speed	Wind Direction	
		mg/m³	mg/m³	mg/m³	mg/m³	mg/m³	m/s	Deg.	Direction
		Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly
03 June, 2024	12:00 ~ 12:59	0.126	0.049	0.008	0.022	0.022	0.82	233	SW
03 June, 2024	13:00 ~ 13:59	0.773	0.076	0.001	0.005	0.032	0.50	241	WSW
03 June, 2024	14:00 ~ 14:59	0.019	0.054	0.001	0.004	0.009	0.57	239	WSW
03 June, 2024	15:00 ~ 15:59	0.038	0.044	0.001	0.002	0.010	0.78	240	WSW
03 June, 2024	16:00 ~ 16:59	0.022	0.026	0.011	0.026	0.008	0.12	286	WNW
03 June, 2024	17:00 ~ 17:59	0.049	0.053	0.012	0.040	0.004	0.08	251	WSW
03 June, 2024	18:00 ~ 18:59	0.085	0.067	0.013	0.045	0.008	0.07	242	WSW
03 June, 2024	19:00 ~ 19:59	0.068	0.065	0.010	0.051	0.005	0.13	228	SW
03 June, 2024	20:00 ~ 20:59	0.051	0.059	0.008	0.047	0.004	0.00	168	SSE
03 June, 2024	21:00 ~ 21:59	0.025	0.056	0.014	0.028	0.005	0.00	90	E
03 June, 2024	22:00 ~ 22:59	0.014	0.051	0.026	0.037	0.009	0.00	90	E
03 June, 2024	23:00 ~ 23:59	0.045	0.046	0.032	0.053	0.008	0.00	90	E
04 June, 2024	00:00 ~ 00:59	0.034	0.046	0.015	0.023	0.008	0.00	90	E
04 June, 2024	01:00 ~ 01:59	0.036	0.043	0.018	0.036	0.006	0.00	90	E
04 June, 2024	02:00 ~ 02:59	0.023	0.042	0.018	0.035	0.007	0.00	90	E
04 June, 2024	03:00 ~ 03:59	0.037	0.044	0.021	0.041	0.004	0.00	85	E
04 June, 2024	04:00 ~ 04:59	0.043	0.043	0.017	0.025	0.007	0.08	87	E
04 June, 2024	05:00 ~ 05:59	0.056	0.038	0.021	0.034	0.007	0.05	97	E
04 June, 2024	06:00 ~ 06:59	0.098	0.039	0.023	0.044	0.004	0.07	116	ESE
04 June, 2024	07:00 ~ 07:59	0.197	0.056	0.004	0.058	0.008	0.22	115	ESE
04 June, 2024	08:00 ~ 08:59	0.054	0.037	0.003	0.057	0.006	0.53	119	ESE
04 June, 2024	09:00 ~ 09:59	0.090	0.037	0.001	0.002	0.039	0.43	127	SE
04 June, 2024	10:00 ~ 10:59	0.107	0.004	0.010	0.022	0.032	0.70	194	SSW
04 June, 2024	11:00 ~ 11:59	0.116	0.043	0.003	0.018	0.004	0.20	150	SSE

Max	0.773	0.076	0.032	0.058	0.039
Avg	0.092	0.047	0.012	0.031	0.011
Min	0.014	0.004	0.001	0.002	0.004

Date	Time	CO	NO_2	$PM_{2.5}$	PM_{10}	SO_2	Wind Speed	Wind Direction	
		mg/m³	mg/m³	mg/m³	mg/m³	mg/m³	m/s	Deg.	Direction
		Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly
04 June, 2024	12:00 ~ 12:59	0.144	0.068	0.001	0.009	0.006	0.25	131.17	SE
04 June, 2024	13:00 ~ 13:59	0.018	0.042	0.009	0.024	0.010	0.35	196.50	SSW
04 June, 2024	14:00 ~ 14:59	0.081	0.057	0.004	0.012	0.007	0.20	235.83	SW
04 June, 2024	15:00 ~ 15:59	0.145	0.048	0.002	0.011	0.009	0.38	233.33	SW
04 June, 2024	16:00 ~ 16:59	0.003	0.007	0.017	0.030	0.022	0.62	238.00	WSW
04 June, 2024	17:00 ~ 17:59	0.168	0.031	0.001	0.002	0.008	0.82	240.00	WSW
04 June, 2024	18:00 ~ 18:59	0.061	0.033	0.008	0.015	0.010	0.60	235.00	SW
04 June, 2024	19:00 ~ 19:59	0.042	0.035	0.006	0.017	0.010	0.38	239.00	WSW
04 June, 2024	20:00 ~ 20:59	0.032	0.036	0.001	0.003	0.004	0.33	239.50	WSW
04 June, 2024	21:00 ~ 21:59	0.032	0.033	0.006	0.008	0.010	0.22	232.33	SW
04 June, 2024	22:00 ~ 22:59	0.039	0.033	0.009	0.025	0.005	0.05	216.83	SW
04 June, 2024	23:00 ~ 23:59	0.055	0.037	0.001	0.027	0.006	0.00	202.40	SSW
05 June, 2024	00:00 ~ 00:59	0.021	0.035	0.003	0.007	0.007	0.00	155.00	SSE
05 June, 2024	01:00 ~ 01:59	0.077	0.032	0.003	0.005	0.004	0.00	174.83	S
05 June, 2024	02:00 ~ 02:59	0.008	0.038	0.005	0.007	0.003	0.02	232.33	SW
05 June, 2024	03:00 ~ 03:59	0.002	0.034	0.004	0.006	0.010	0.02	256.50	WSW
05 June, 2024	04:00 ~ 04:59	0.012	0.034	0.005	0.008	0.011	0.05	239.17	WSW
05 June, 2024	05:00 ~ 05:59	0.015	0.033	0.007	0.011	0.005	0.12	241.50	WSW
05 June, 2024	06:00 ~ 06:59	0.036	0.032	0.013	0.019	0.004	0.17	233.00	SW
05 June, 2024	07:00 ~ 07:59	0.021	0.034	0.002	0.003	0.008	0.10	236.00	SW
05 June, 2024	08:00 ~ 08:59	0.010	0.029	0.001	0.005	0.010	0.20	237.40	WSW
05 June, 2024	09:00 ~ 09:59	0.046	0.014	0.002	0.003	0.006	0.62	237.00	WSW
05 June, 2024	10:00 ~ 10:59	0.071	0.004	0.001	0.003	0.008	0.62	235.67	SW
05 June, 2024	11:00 ~ 11:59	0.069	0.004	0.001	0.003	0.008	0.38	232.83	SW

Max	0.168	0.068	0.017	0.030	0.022
Avg	0.050	0.033	0.005	0.011	0.008
Min	0.002	0.004	0.001	0.002	0.003

Date	Time	CO	NO_2	$PM_{2.5}$	PM_{10}	SO_2	Wind Speed	Wind Direction	
		mg/m³	mg/m³	mg/m³	mg/m³	mg/m³	m/s	Deg.	Direction
		Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly
05 June, 2024	12:00 ~ 12:59	0.034	0.004	0.001	0.003	0.003	0.33	175.17	S
05 June, 2024	13:00 ~ 13:59	0.069	0.004	0.014	0.022	0.003	0.68	165.33	SSE
05 June, 2024	14:00 ~ 14:59	0.056	0.027	0.033	0.061	0.005	1.12	238.50	WSW
05 June, 2024	15:00 ~ 15:59	0.100	0.049	0.003	0.008	0.004	0.68	240.00	WSW
05 June, 2024	16:00 ~ 16:59	0.048	0.034	0.001	0.003	0.007	0.45	244.67	WSW
05 June, 2024	17:00 ~ 17:59	0.029	0.024	0.001	0.002	0.008	0.58	218.83	SW
05 June, 2024	18:00 ~ 18:59	0.055	0.022	0.005	0.013	0.009	1.45	242.67	WSW
05 June, 2024	19:00 ~ 19:59	0.061	0.035	0.007	0.013	0.010	0.58	246.67	WSW
05 June, 2024	20:00 ~ 20:59	0.018	0.038	0.002	0.013	0.006	0.40	238.00	WSW
05 June, 2024	21:00 ~ 21:59	0.034	0.031	0.001	0.003	0.006	0.40	235.33	SW
05 June, 2024	22:00 ~ 22:59	0.027	0.034	0.003	0.005	0.006	0.22	234.00	SW
05 June, 2024	23:00 ~ 23:59	0.042	0.031	0.003	0.006	0.009	0.15	239.83	WSW
06 June, 2024	00:00 ~ 00:59	0.027	0.030	0.004	0.008	0.009	0.15	237.17	WSW
06 June, 2024	01:00 ~ 01:59	0.017	0.032	0.005	0.008	0.003	0.07	238.67	WSW
06 June, 2024	02:00 ~ 02:59	0.026	0.029	0.003	0.007	0.003	0.03	145.33	SE
06 June, 2024	03:00 ~ 03:59	0.019	0.027	0.005	0.008	0.007	0.08	149.67	SSE
06 June, 2024	04:00 ~ 04:59	0.048	0.031	0.008	0.013	0.012	0.07	192.00	SSW
06 June, 2024	05:00 ~ 05:59	0.023	0.029	0.011	0.017	0.005	0.10	173.17	S
06 June, 2024	06:00 ~ 06:59	0.039	0.029	0.006	0.012	0.004	0.07	134.33	SE
06 June, 2024	07:00 ~ 07:59	0.036	0.024	0.001	0.003	0.003	0.33	137.00	SE
06 June, 2024	08:00 ~ 08:59	0.019	0.026	0.002	0.005	0.003	0.47	127.83	SE
06 June, 2024	09:00 ~ 09:59	0.038	0.009	0.002	0.004	0.003	0.62	165.67	SSE
06 June, 2024	10:00 ~ 10:59	0.075	0.004	0.002	0.003	0.018	0.55	183.33	S
06 June, 2024	11:00 ~ 11:59	0.052	0.005	0.002	0.004	0.033	0.85	174.67	S

Max	0.100	0.049	0.033	0.061	0.033
Avg	0.041	0.025	0.005	0.010	0.007
Min	0.017	0.004	0.001	0.002	0.003

Date	Time	CO	NO_2	$PM_{2.5}$	PM_{10}	SO_2	Wind Speed	Wind Direction	
		mg/m³	mg/m³	mg/m³	mg/m³	mg/m³	m/s	Deg.	Direction
		Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly
06 June, 2024	12:00 ~ 12:59	0.066	0.004	0.028	0.043	0.026	0.73	176.00	S
06 June, 2024	13:00 ~ 13:59	0.069	0.007	0.011	0.018	0.011	0.35	205.00	SSW
06 June, 2024	14:00 ~ 14:59	0.049	0.013	0.013	0.025	0.009	0.55	214.50	SW
06 June, 2024	15:00 ~ 15:59	0.166	0.050	0.012	0.069	0.010	0.37	229.67	SW
06 June, 2024	16:00 ~ 16:59	0.187	0.052	0.005	0.051	0.005	0.27	216.67	SW
06 June, 2024	17:00 ~ 17:59	0.010	0.048	0.001	0.039	0.005	0.10	135.50	SE
06 June, 2024	18:00 ~ 18:59	0.048	0.040	0.028	0.054	0.010	0.03	116.00	ESE
06 June, 2024	19:00 ~ 19:59	0.060	0.040	0.015	0.052	0.010	0.03	88.33	E
06 June, 2024	20:00 ~ 20:59	0.067	0.038	0.022	0.042	0.007	0.00	102.00	ESE
06 June, 2024	21:00 ~ 21:59	0.079	0.036	0.028	0.042	0.007	0.05	98.33	E
06 June, 2024	22:00 ~ 22:59	0.001	0.037	0.025	0.039	0.011	0.08	274.00	W
06 June, 2024	23:00 ~ 23:59	0.005	0.029	0.027	0.065	0.005	0.63	237.83	WSW
07 June, 2024	00:00 ~ 00:59	0.039	0.042	0.008	0.028	0.005	0.32	244.67	WSW
07 June, 2024	01:00 ~ 01:59	0.029	0.035	0.001	0.010	0.006	0.13	232.33	SW
07 June, 2024	02:00 ~ 02:59	0.031	0.039	0.008	0.015	0.008	0.13	252.33	WSW
07 June, 2024	03:00 ~ 03:59	0.010	0.035	0.010	0.016	0.009	0.15	253.00	WSW
07 June, 2024	04:00 ~ 04:59	0.029	0.032	0.008	0.012	0.006	0.25	239.00	WSW
07 June, 2024	05:00 ~ 05:59	0.082	0.032	0.012	0.018	0.004	0.08	243.17	WSW
07 June, 2024	06:00 ~ 06:59	0.018	0.036	0.007	0.024	0.005	0.02	189.50	S
07 June, 2024	07:00 ~ 07:59	0.009	0.034	0.003	0.005	0.009	0.17	155.33	SSE
07 June, 2024	08:00 ~ 08:59	0.035	0.029	0.002	0.003	0.006	0.27	219.33	SW
07 June, 2024	09:00 ~ 09:59	0.007	0.013	0.002	0.004	0.007	0.72	238.17	WSW
07 June, 2024	10:00 ~ 10:59	0.033	0.011	0.001	0.003	0.007	0.88	234.33	SW
07 June, 2024	11:00 ~ 11:59	0.046	0.012	0.002	0.005	0.028	0.57	239.67	WSW

Max	0.187	0.052	0.028	0.069	0.028
Avg	0.049	0.031	0.012	0.028	0.009
Min	0.001	0.004	0.001	0.003	0.004

Date	Time	CO	NO_2	$PM_{2.5}$	PM_{10}	SO_2	Wind Speed	Wind Direction	
		mg/m³	mg/m³	mg/m³	mg/m³	mg/m³	m/s	Deg.	Direction
		Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly
07 June, 2024	12:00 ~ 12:59	0.047	0.007	0.008	0.021	0.029	0.27	249.17	WSW
07 June, 2024	13:00 ~ 13:59	0.034	0.004	0.021	0.026	0.033	0.12	275.67	W
07 June, 2024	14:00 ~ 14:59	0.166	0.024	0.004	0.007	0.005	0.30	238.67	WSW
07 June, 2024	15:00 ~ 15:59	0.010	0.026	0.002	0.004	0.007	0.37	243.83	WSW
07 June, 2024	16:00 ~ 16:59	0.026	0.014	0.003	0.005	0.008	0.27	268.00	W
07 June, 2024	17:00 ~ 17:59	0.026	0.014	0.002	0.005	0.009	0.05	250.67	WSW
07 June, 2024	18:00 ~ 18:59	0.059	0.017	0.019	0.023	0.004	0.08	227.83	SW
07 June, 2024	19:00 ~ 19:59	0.063	0.027	0.060	0.083	0.006	0.28	235.83	SW
07 June, 2024	20:00 ~ 20:59	0.028	0.032	0.010	0.044	0.009	0.32	194.33	SSW
07 June, 2024	21:00 ~ 21:59	0.002	0.034	0.003	0.040	0.004	0.90	234.00	SW
07 June, 2024	22:00 ~ 22:59	0.052	0.028	0.016	0.031	0.005	0.75	234.67	SW
07 June, 2024	23:00 ~ 23:59	0.045	0.033	0.002	0.016	0.011	0.75	233.33	SW
08 June, 2024	00:00 ~ 00:59	0.031	0.033	0.005	0.013	0.013	0.97	236.50	WSW
08 June, 2024	01:00 ~ 01:59	0.026	0.032	0.005	0.013	0.007	0.78	233.33	SW
08 June, 2024	02:00 ~ 02:59	0.020	0.029	0.003	0.010	0.006	0.42	234.67	SW
08 June, 2024	03:00 ~ 03:59	0.017	0.028	0.004	0.007	0.005	0.05	251.33	WSW
08 June, 2024	04:00 ~ 04:59	0.016	0.026	0.008	0.010	0.007	0.05	215.83	SW
08 June, 2024	05:00 ~ 05:59	0.016	0.025	0.006	0.008	0.009	0.28	230.50	SW
08 June, 2024	06:00 ~ 06:59	0.021	0.023	0.007	0.012	0.010	0.22	232.67	SW
08 June, 2024	07:00 ~ 07:59	0.034	0.025	0.006	0.010	0.010	0.32	232.00	SW
08 June, 2024	08:00 ~ 08:59	0.029	0.021	0.002	0.004	0.010	0.43	231.00	SW
08 June, 2024	09:00 ~ 09:59	0.052	0.005	0.002	0.003	0.011	0.57	227.50	SW
08 June, 2024	10:00 ~ 10:59	0.708	0.004	0.001	0.003	0.005	0.63	235.83	SW
08 June, 2024	11:00 ~ 11:59	0.126	0.004	0.001	0.002	0.034	0.38	235.33	SW

Max	0.708	0.034	0.060	0.083	0.034
Avg	0.069	0.021	0.008	0.017	0.011
Min	0.002	0.004	0.001	0.002	0.004

Date	Time	CO	NO_2	$PM_{2.5}$	PM_{10}	SO_2	Wind Speed	Wind Direction	
		mg/m³	mg/m³	mg/m³	mg/m³	mg/m³	m/s	Deg.	Direction
		Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly
08 June, 2024	12:00 ~ 12:59	0.695	0.004	0.002	0.004	0.038	0.55	235.33	SW
08 June, 2024	13:00 ~ 13:59	0.360	0.004	0.001	0.003	0.036	0.72	237.17	WSW
08 June, 2024	14:00 ~ 14:59	0.471	0.004	0.031	0.036	0.030	0.85	237.17	WSW
08 June, 2024	15:00 ~ 15:59	0.501	0.004	0.054	0.062	0.034	0.93	240.33	WSW
08 June, 2024	16:00 ~ 16:59	0.510	0.004	0.043	0.049	0.029	0.78	237.17	WSW
08 June, 2024	17:00 ~ 17:59	0.726	0.004	0.034	0.052	0.007	1.00	230.50	SW
08 June, 2024	18:00 ~ 18:59	0.715	0.024	0.021	0.034	0.008	1.04	234.80	SW
08 June, 2024	19:00 ~ 19:59	0.073	0.030	0.050	0.075	0.012	0.80	235.33	SW
08 June, 2024	20:00 ~ 20:59	0.146	0.047	0.003	0.039	0.011	0.23	245.33	WSW
08 June, 2024	21:00 ~ 21:59	0.111	0.060	0.001	0.035	0.012	0.23	239.50	WSW
08 June, 2024	22:00 ~ 22:59	0.050	0.051	0.008	0.024	0.012	0.43	238.00	WSW
08 June, 2024	23:00 ~ 23:59	0.014	0.032	0.005	0.021	0.006	0.40	227.83	SW
09 June, 2024	00:00 ~ 00:59	0.029	0.039	0.002	0.006	0.007	0.53	235.50	SW
09 June, 2024	01:00 ~ 01:59	0.025	0.035	0.004	0.007	0.010	0.58	229.50	SW
09 June, 2024	02:00 ~ 02:59	0.032	0.033	0.002	0.004	0.008	0.27	237.50	WSW
09 June, 2024	03:00 ~ 03:59	0.030	0.032	0.003	0.007	0.004	0.08	235.67	SW
09 June, 2024	04:00 ~ 04:59	0.029	0.034	0.004	0.008	0.009	0.12	237.83	WSW
09 June, 2024	05:00 ~ 05:59	0.026	0.032	0.004	0.008	0.009	0.17	233.83	SW
09 June, 2024	06:00 ~ 06:59	0.036	0.031	0.006	0.009	0.010	0.20	239.17	WSW
09 June, 2024	07:00 ~ 07:59	0.051	0.028	0.004	0.008	0.011	0.17	242.83	WSW
09 June, 2024	08:00 ~ 08:59	0.010	0.011	0.001	0.002	0.004	0.45	234.00	SW
09 June, 2024	09:00 ~ 09:59	0.033	0.006	0.001	0.002	0.006	0.52	238.50	WSW
09 June, 2024	10:00 ~ 10:59	0.024	0.004	0.001	0.003	0.024	0.42	231.67	SW
09 June, 2024	11:00 ~ 11:59	0.020	0.005	0.001	0.002	0.025	0.47	236.50	WSW

Max	0.726	0.060	0.054	0.075	0.038
Avg	0.197	0.023	0.012	0.021	0.015
Min	0.010	0.004	0.001	0.002	0.004

Date	Time	CO	NO_2	$PM_{2.5}$	PM_{10}	SO_2	Wind Speed	Wind Direction	
		mg/m³	mg/m³	mg/m³	mg/m³	mg/m³	m/s	Deg.	Direction
		Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly
09 June, 2024	12:00 ~ 12:59	0.010	0.004	0.004	0.007	0.037	0.38	244.67	WSW
09 June, 2024	13:00 ~ 13:59	0.081	0.004	0.025	0.037	0.034	0.58	234.00	SW
09 June, 2024	14:00 ~ 14:59	0.018	0.004	0.002	0.004	0.019	0.27	243.67	WSW
09 June, 2024	15:00 ~ 15:59	0.025	0.004	0.015	0.018	0.024	0.38	237.50	WSW
09 June, 2024	16:00 ~ 16:59	0.023	0.004	0.033	0.042	0.023	0.58	233.67	SW
09 June, 2024	17:00 ~ 17:59	0.020	0.011	0.030	0.038	0.006	0.88	239.33	WSW
09 June, 2024	18:00 ~ 18:59	0.080	0.021	0.021	0.028	0.005	0.75	236.17	SW
09 June, 2024	19:00 ~ 19:59	0.127	0.029	0.012	0.022	0.010	0.70	237.00	WSW
09 June, 2024	20:00 ~ 20:59	0.083	0.031	0.004	0.007	0.007	0.82	232.17	SW
09 June, 2024	21:00 ~ 21:59	0.062	0.037	0.004	0.011	0.008	0.62	235.33	SW
09 June, 2024	22:00 ~ 22:59	0.049	0.038	0.004	0.009	0.008	0.50	233.83	SW
09 June, 2024	23:00 ~ 23:59	0.037	0.031	0.004	0.011	0.007	0.47	234.00	SW
10 June, 2024	00:00 ~ 00:59	0.023	0.037	0.004	0.012	0.006	0.38	236.33	WSW
10 June, 2024	01:00 ~ 01:59	0.015	0.037	0.004	0.010	0.007	0.32	235.67	SW
10 June, 2024	02:00 ~ 02:59	0.028	0.032	0.004	0.008	0.006	0.45	236.00	SW
10 June, 2024	03:00 ~ 03:59	0.029	0.035	0.002	0.007	0.005	0.33	236.83	WSW
10 June, 2024	04:00 ~ 04:59	0.033	0.031	0.001	0.004	0.009	0.33	231.00	SW
10 June, 2024	05:00 ~ 05:59	0.042	0.035	0.002	0.007	0.011	0.10	235.17	SW
10 June, 2024	06:00 ~ 06:59	0.029	0.034	0.003	0.008	0.012	0.13	220.17	SW
10 June, 2024	07:00 ~ 07:59	0.035	0.027	0.001	0.003	0.008	0.25	235.83	SW
10 June, 2024	08:00 ~ 08:59	0.044	0.008	0.001	0.002	0.003	0.37	234.00	SW
10 June, 2024	09:00 ~ 09:59	0.039	0.004	0.001	0.002	0.003	0.27	229.83	SW
10 June, 2024	10:00 ~ 10:59	0.025	0.004	0.001	0.002	0.011	0.28	228.67	SW
10 June, 2024	11:00 ~ 11:59	0.028	0.004	0.001	0.002	0.045	0.37	220.67	SW

Max	0.127	0.038	0.033	0.042	0.045
Avg	0.041	0.021	0.008	0.013	0.013
Min	0.010	0.004	0.001	0.002	0.003

APPENDIX-2 CERTIFICATE OF CALIBRATION

NANOVA Co., Ltd.
Medical Scientific Industrial

SYSTEM HEALTH CHECK REPORT

Information

Instrument---------- Haz-scanner
Model---------- EPAS
Serial number---------- 918189
Unit Sensor---------- CO,NO2,O3,NO,SO2,PM10
PM2.5,T & RH,WS/WD,SLRR
Customer---------- Myanmar Koei International LTD.
Date---------- 2024 April

Check List

Physical Check---------- OK
Supply Voltage Check---------- OK
PM 10,PM2.5 Air Flow Check---------- OK
SLRR,T & RH,WS/WD sensor Check---------- OK
NO,SO2 Sensor Health Check---------- Moderate
CO,NO2,O3 Sensor Health Check---------- Still Good
Lithium Battery Voltage Check---------- OK
Data Logging Check---------- OK
Data Downloading Check---------- OK

Recommend

To replace new acid gas scrubber every 6 months.
To replace internal filters every 6 months.
To perform factory calibration or in-field calibration every 12 months.

Performed by
Phoe Saw Htoo
Technical Service Engineer
NANOVA CO.,LTD

Approved by
Myo Oo
Technical Service Manager
NANOVA CO.,LTD

Yangon : 22-A, Shan Yeikthar Street, Sanchaung Township, Tel: +95 (1) 230 4901, 230 4902
Nay Pyi Taw : Za / 30, Ziwaka Say Sine Tan, Tha Phay Khone, Pyimanar. Tel:067 810 8083
Mandalay : 153 - B, 73 Street, Between 33x34, Chanaye Tharzan Township.Tel:09 430 66668
contact@nanovapteltd.com , website: www.nanova-scientific.com
Helpline: 09 421 360000, 09 451 360000

Japan Thilawa Development Limited Myanmar MJTD

Thilawa Special Economic Zone

Zone B– Phase 1,2 & 3 (Operation phase)

Appendix-E

Noise and Vibration Monitoring Report

June 2024

NOISE AND VIBRATION

MONITORING REPORT

FOR DEVELOPMENT OF INDUSTRIAL AREA

THILAWA SEZ ZONE B

(PHASE 1, 2 & 3 OPERATION STAGE)

(BI-ANNUALLY MONITORING)

June 2024

Myanmar Koei International Ltd.

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CHAPTER 1: OUTLINES AND SUMMARY OF MONITORING PLAN

1.1 General

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

1.2 Outlines of Monitoring Plan

To assess the environmental condition under the operation of industrial area in and around Thilawa SEZ Zone B, noise and vibration levels had been monitored from 3 June 2024 to 4 June 2024 as follows;

Table 1.2-1 Outlines of Noise and Vibration Level Monitoring

Monitoring Date	Monitoring Item	Parameters	Number of Points	Duration	Monitoring Methodology
4 June 2024	Noise Level	L_{Aeq} (dB)	1 (NV-1)	8 hours	On-site measurement by "Rion NL-42 sound level meter"
3 June 2024	Noise Level	L_{Aeq} (dB)	1 (NV-2)	8 hours	On-site measurement by "Rion NL-42 sound level meter"
4 June 2024	Vibration Level	L_{v10} (dB)	1 (NV-1)	8 hours	On-site measurement by "Vibration Level Meter- VM-53A"
3 June 2024	Vibration Level	L_{v10} (dB)	1 (NV-2)	8 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-weighed loudness equivalent (L_{Aeq})
2	Vibration	Vibration level, vertical, percentile (L_{V10})

Source: Myanmar Koei International Ltd.

2.2 Monitoring Location

Noise and vibration levels were measured in the northeast corner of the Thilawa SEZ Zone B, namely NV-1 (N: 16°40'18.22", E: 96°17'18.18") for traffic noise concerned and inside the monastery compound of Phalan village, adjacent to the southern boundary of the Thilawa SEZ Zone B, as NV-2 (N: 16°39'24.90", E: 96°17'16.70") for sensitive area noise level. The location of the noise and vibration monitoring points are shown in Figure 2.2-1.

Source: Google Earth

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

NV-1

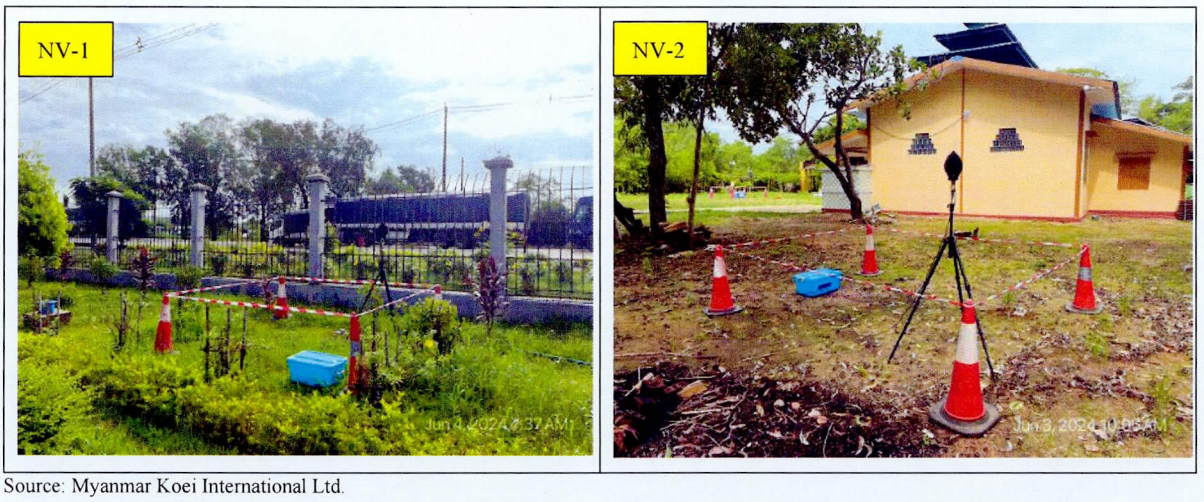
NV-1 is located in front of temporary gate of operation site of Thilawa SEZ Zone B and next to Thilawa Development Road. The surrounding area are Zone A in the northwest, local industrial zone in the east respectively. Possible sources of noise and vibration is generated from construction activities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

NV-2

NV-2 is located inside the monastery compound of Phalan village, adjacent to the southern boundary of the Thilawa SEZ Zone B and surrounded by the residential houses of Phalan village in the south and the fields in west. Thilawa SEZ Zone A is distanced about 2 km north of NV-2 and local industrial zone about 1 km northeast respectively. Possible sources of noise and vibration is generated from construction activities from Zone B and daily human activities from nearby Phalan village.

2.3 Monitoring Method

Noise level was measured by "Rion NL-42 sound level meter" and automatically records every 10 minutes in a memory card. The vibration level meter, VM-53A (Rion Co., Ltd., Japan), was accompanied by a 3-axis accelerometer PV-83C (Rion Co., Ltd.) and it was placed on solid soil ground. Vertical vibration (Z axis), L_v, was measured every 10 minutes within the adaptable range of (10-70) dB at NV-1 and NV-2 and recorded to a memory card.
The measurement period of noise and vibration was 8 hours for each monitoring point. The status of the noise and vibration level monitoring on NV-1 and NV-2 are shown in Figure 2.3-1.



Source: Myanmar Koei International Ltd.

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

2.4 Monitoring Results

Noise Monitoring Results

Noise monitoring results are separated as daytime (6:00 AM to 10:00 PM) and evening time (10:00 PM to 6:00 AM) time frames for NV-1 and daytime (7:00 AM to 7:00 PM), evening time (7:00 PM to 10:00 PM) and night time (10:00 PM to 7:00 AM) time frames for NV-2 respectively. Noise measurement was carried out for 8-hour as working time (8:00 AM to 4:00 PM) at the designated locations instead of 24-hours due to the safety reason and risk avoidance. The monitoring results are summarized in Table 2.4-1 and Table 2.4-2. Hourly noise level (LA_{eq}) monitoring results at NV-1 and NV-2 are shown in Table 2.4-3 and Table 2.4-4. Figure 2.4-1 and Figure 2.4-2 show the results of noise level (LA_{eq}) at NV-1 and NV-2. Comparing with the target value of noise level in operation stage prescribed in EIA report for Thilawa SEZ development project Zone B, all results were within limitations. Regarding the hourly noise level, one-hour LA_{eq} during 11:00 - 12:00 at NV-2 was exceeded the limitation though there were no construction activities at that time. According to the field surveyor record, it was due to the heavy rain at that time. Therefore, it is considered that there is no impact from operation activities of Zone B to the surrounding environment.

Table 2.4-1 Results of Noise Level (LA_{eq}) Monitoring at NV-1

Date	(Traffic Noise Level) Equivalent Noise Level (LA_{eq}, dB)	
	Day Time (6:00 AM – 10:00 PM)	Night Time (10:00 PM – 6:00 AM)
4 June, 2024	61	-
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 Level (LA_{eq}) Monitoring at NV-2

Date	(A side next to sensitive area such as monastery, hospital and school) Equivalent Noise Level (LA_{eq}, 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)
3 June, 2024	55	-	-
Target Value	60	55	50

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 B).
Source: Myanmar Koei International Ltd.

Table 2.4-3 Hourly Results of Noise Level (LA_{eq}) Monitoring at NV-1

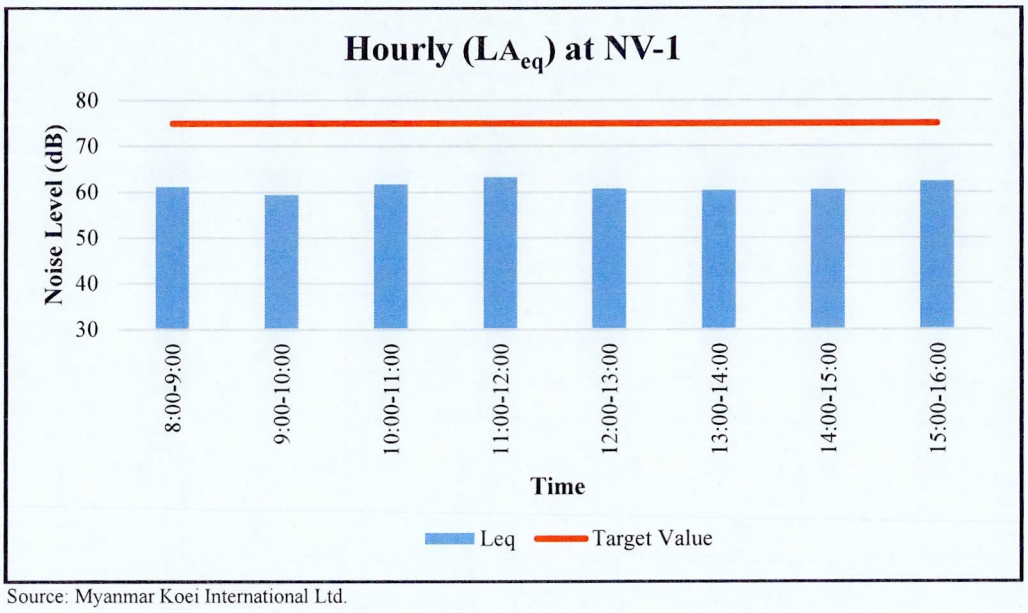
Date	Time	Hourly Result LA_{eq} (dB)	Interval Result LA_{eq} (dB)	Target Value LA_{eq} (dB)	Remark
4 June, 2024	6:00-7:00	-	61	75	No construction Activities
	7:00-8:00	-			
	8:00-9:00	61			
	9:00-10:00	59			
	10:00-11:00	62			
	11:00-12:00	63			
	12:00-13:00	61			
	13:00-14:00	60			
	14:00-15:00	60			
	15:00-16:00	62			
	16:00-17:00	-			
	17:00-18:00	-			
	18:00-19:00	-			
	19:00-20:00	-			
	20:00-21:00	-			
	21:00-22:00	-			
	22:00-23:00	-	-	70	
	23:00-24:00	-			
	24:00-1:00	-			
	1:00-2:00	-			
	2:00-3:00	-			
	3:00-4:00	-			
	4:00-5:00	-			
	5:00-6:00	-			

Source: Myanmar Koei International Ltd.

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

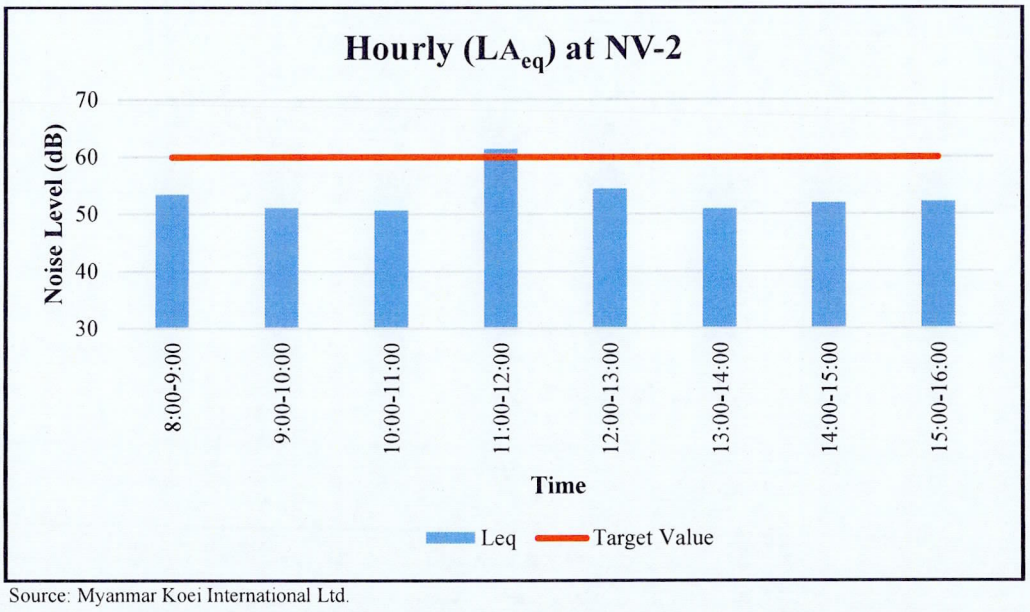
Date	Time	Hourly Result LA_{eq} (dB)	Interval Result LA_{eq} (dB)	Target Value LA_{eq} (dB)	Remark
3 June, 2024	7:00-8:00	-	55	60	No construction Activities
	8:00-9:00	53			
	9:00-10:00	51			
	10:00-11:00	51			
	11:00-12:00	61			
	12:00-13:00	54			
	13:00-14:00	51			
	14:00-15:00	52			
	15:00-16:00	52			
	16:00-17:00	-			
	17:00-18:00	-			
	18:00-19:00	-			
	19:00-20:00	-	-	55	
	20:00-21:00	-			
	21:00-22:00	-			
	22:00-23:00	-	-	50	
	23:00-24:00	-			
	24:00-1:00	-			
	1:00-2:00	-			
	2:00-3:00	-			
	3:00-4:00	-			
	4:00-5:00	-			
	5:00-6:00	-			
	6:00-7:00	-			

Source: Myanmar Koei International Ltd.



Source: Myanmar Koei International Ltd.

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



Source: Myanmar Koei International Ltd.

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

Vibration Monitoring Results

Vibration monitoring results are separated as 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 both NV-1 and NV-2. Vibration measurement was carried out for 8-hour as working time (8:00 AM to 4:00 PM) at the designated locations instead of 24-hours due to the safety reason and risk avoidance. The results of vibration level (L_{v10}) monitoring at NV-1 and NV-2 are shown in Table 2.4-5 and Table 2.4-6. Hourly vibration level (L_{v10}) monitoring results at NV-1 and NV-2 are shown in Table 2.4-7 and Table 2.4-8. Figure 2.4-3 and Figure 2.4-4 showed the graph of vibration level monitoring results at NV-1 and NV-2. By comparing with the target vibration level in operation stage in EIA report for Thilawa SEZ development project Zone B, all of results were within limitations.

Table 2.4-5 Results of Vibration Level (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)
4 June, 2024	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 B).
Source: Myanmar Koei International Ltd.

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

Date	(Residential houses and monastery) 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)
3 June, 2024	23	-	-
Target Value	65	60	60

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 B).
Source: Myanmar Koei International Ltd.

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

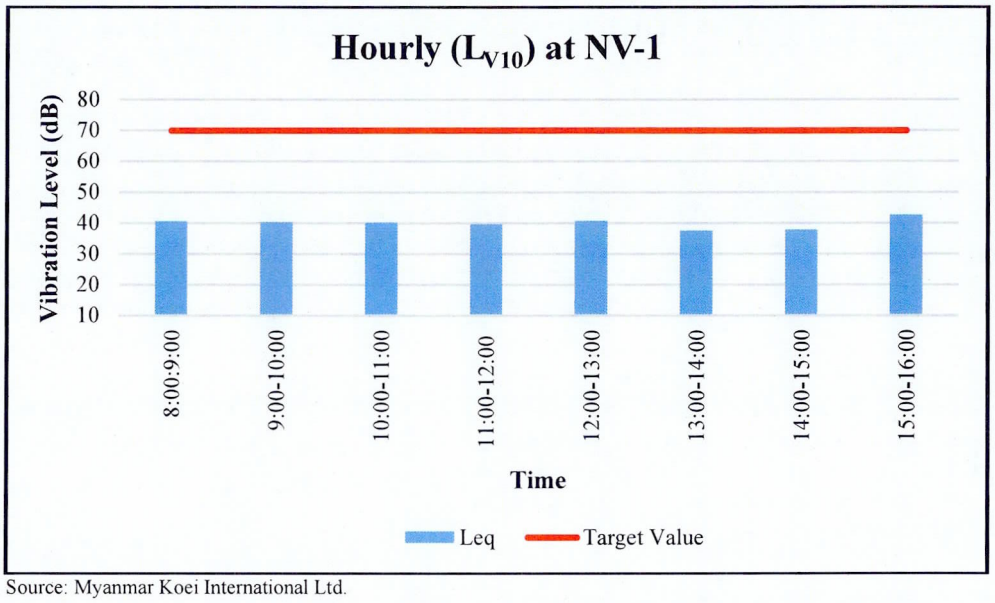
Date	Time	Hourly Result L_{v10} (dB)	Interval Result L_{v10} (dB)	Target Value L_{v10} (dB)	Remark
4 June, 2024	7:00-8:00	-	40	70	No construction Activities
	8:00-9:00	41			
	9:00-10:00	40			
	10:00-11:00	40			
	11:00-12:00	40			
	12:00-13:00	41			
	13:00-14:00	38			
	14:00-15:00	38			
	15:00-16:00	43			
	16:00-17:00	-			
	17:00-18:00	-			
	18:00-19:00	-			
	19:00-20:00	-	-	65	
	20:00-21:00	-			
	21:00-22:00	-			
	22:00-23:00	-	-	65	
	23:00-24:00	-			
	24:00-1:00	-			
	1:00-2:00	-			
	2:00-3:00	-			
	3:00-4:00	-			
	4:00-5:00	-			
	5:00-6:00	-			
	6:00-7:00	-			

Source: Myanmar Koei International Ltd.

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

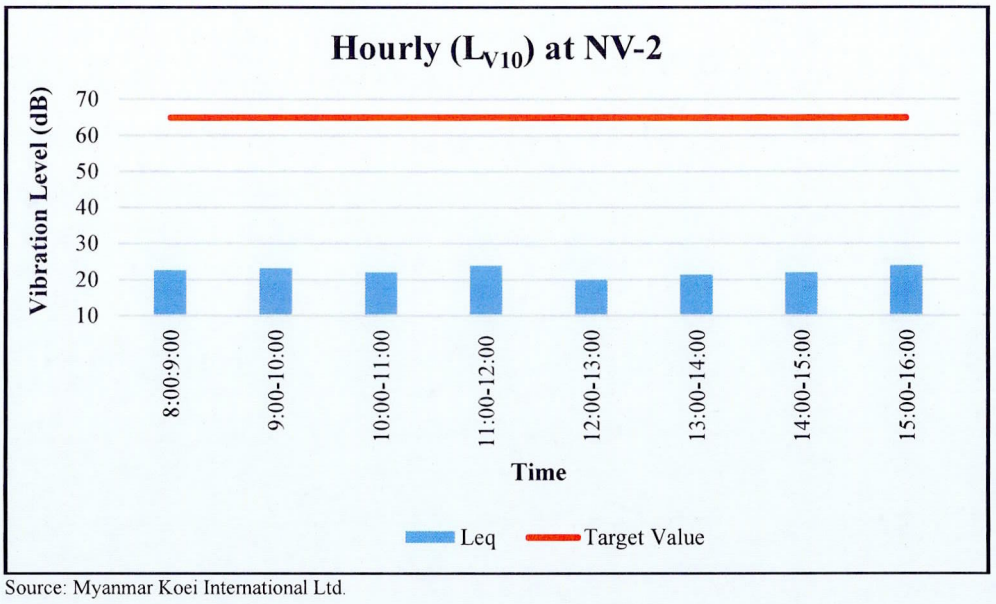
Date	Time	Hourly Result L_{v10} (dB)	Interval Result L_{v10} (dB)	Target Value L_{v10} (dB)	Remark
3 June, 2024	7:00-8:00	-	23	65	No construction Activities
	8:00:9:00	23			
	9:00-10:00	23			
	10:00-11:00	22			
	11:00-12:00	24			
	12:00-13:00	20			
	13:00-14:00	21			
	14:00-15:00	22			
	15:00-16:00	24			
	16:00-17:00	-			
	17:00-18:00	-			
	18:00-19:00	-			
	19:00-20:00	-	-	60	
	20:00-21:00	-			
	21:00-22:00	-			
	22:00-23:00	-	-	60	
	23:00-24:00	-			
	24:00-1:00	-			
	1:00-2:00	-			
	2:00-3:00	-			
	3:00-4:00	-			
	4:00-5:00	-			
	5:00-6:00	-			
	6:00-7:00	-			

Source: Myanmar Koei International Ltd.



Source: Myanmar Koei International Ltd.

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



Source: Myanmar Koei International Ltd.

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

CHAPTER 3: CONCLUSION AND RECOMMENDATION

By Comparing with the target value of noise and vibration level in operation stage prescribed in EIA report for Thilawa SEZ development project Zone B, all results were within limitations except for NV-2 during day time. The result during 11:00 to 12:00 at NV-2 was exceeded the limitation and there were no construction activities at that time. According to the field surveyor record, it was due to the heavy rain at that time. Therefore, it is considered that there is no impact from operation activities of Zone B to the surrounding environment. The results of vibration level for NV-1 and NV-2 were within limitation. Thus, there is no negative impact on noise and vibration from operation activities of Zone B to the surrounding environment.

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

Thilawa Special Economic Zone

Zone B– Phase 1,2 & 3 (Operation phase)

Appendix-F

Traffic Volume Monitoring Report

June 2024

TRAFFIC VOLUME MONITORING REPORT

FOR DEVELOPMENT OF INDUSTRIAL AREA

THILAWA SEZ ZONE B

(PHASE 1, 2 & 3 OPERATION STAGE)

(BI-ANNUALLY MONITORING)

June 2024

Myanmar Koei International Ltd.

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CHAPTER 1: OUTLINES AND SUMMARY OF MONITORING PLAN

1.1 General

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

1.2 Outlines of Monitoring Plan

To assess the environmental condition under the operation of industrial area in and around Thilawa SEZ Zone B, Traffic volume monitoring was carried out for 8-hours as working time (8:00 to 16:00) at one designated location instead of 24 hours due to the safety reason and risk avoidance. Traffic volume had been monitored on 4 June 2024 as follows;

Table 1.2-1 Outlines of Traffic Volume Monitoring

Monitoring Date	Monitoring Item	Parameter	Number of Point	Duration	Monitoring Methodology
4 June 2024	Traffic Volume	-	1 (TV-1)	8 hours	Manual Count

Source: Myanmar Koei International Ltd.

CHAPTER 2: TRAFFIC VOLUME MONITORING

2.1 Monitoring Item

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

Table 2.1-1 Monitoring Parameters for Traffic Volume

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

Source: Myanmar Koei International Ltd.

Table 2.1-2 Classification of Vehicles Types

No.	Classification		Description
1	Two-wheeled vehicle and motorcycle sidecar		Motorbike, Motorcycle sidecar (Taxi)
2	Four-wheeled light vehicle		Pick-up car, Jeep, Taxi, Saloon car, Light truck (under 2 tons)
3	Heavy vehicle		Medium bus, Express, Big bus, medium truck, Heavy truck such as 2 axles, 3 axles and more than 4 axles and Trailer (over 4.5 tons)
4	Others		Tractor

Note: In vehicle classification, two-wheeled vehicle and motorcycle sidecars are included in Number 1. A motorcycle sidecar is a modified motorbike for local-purpose use.
Source: Myanmar Koei International Ltd.

2.2 Monitoring Location

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

Source: Myanmar Koei International Ltd.

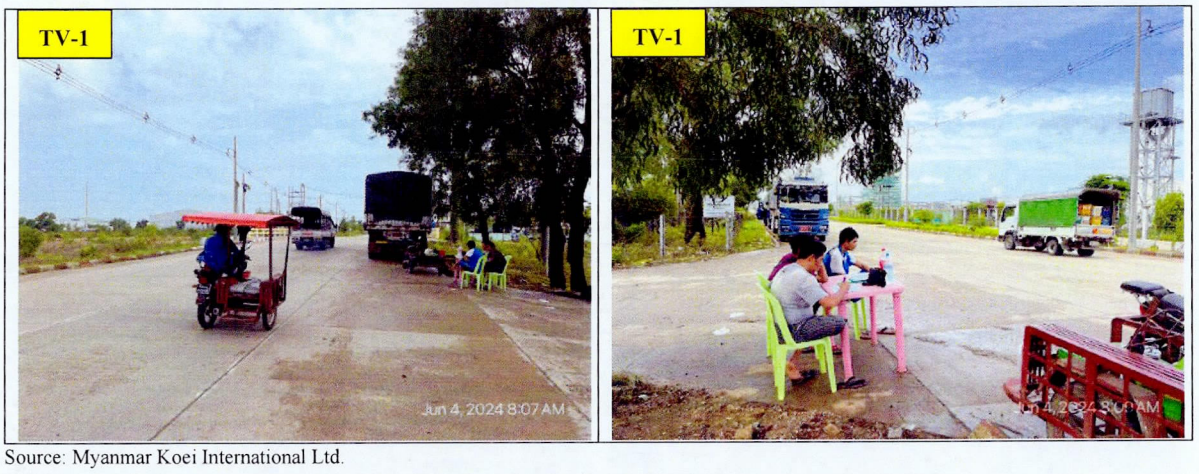
Figure 2.2-1 Location of Traffic Volume Monitoring Point

TV-1

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

2.3 Monitoring Method

The traffic volume monitoring was conducted for 8 hours at the same time as the traffic noise and vibration level monitoring. Traffic volume monitoring was conducted to count the number of vehicles moving from Phalan village to Dagon-Thilawa Road and from Dagon-Thilawa Road to Phalan village in each direction. Manual count method was used and data was recorded using tally sheets. The status of the traffic volume monitoring at TV-1 is shown in Figure 2.3-1.



Source: Myanmar Koei International Ltd.

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

2.4 Monitoring Results

The traffic volume monitoring results are summarized in Table 2.4-1. Hourly quantity of each type of vehicle were recorded. Table 2.4-1 shows that the number of 4-wheel light vehicles are distinctly and highly utilized in weekdays. The number of heavy vehicle moving from Phalan village to Dagon-Thilawa Road is four times lower than that of 4-wheel light vehicles and heavy vehicle moving from Dagon-Thiawa Road to Phalan village is also three times lower than that of 4-wheel light vehicles.

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

Survey Point	Direction	Date	Weekday	2-wheel Vehicles and motorcycle sidecar	4-wheel Light Vehicles	Heavy Vehicles	Others	Total
TV-1	Phalan village to Dagon-Thilawa road	4 June 2024	Tuesday	347	583	141	9	1,080
	Dagon-Thilawa road to Phalan village			339	642	209	21	1,211

Source: Myanmar Koei International Ltd.

The summary monitoring results of hourly traffic volume at TV-1 is shown in Table 2.4-2 and Table 2.4-3 respectively. Comparing the result of each direction in the morning as 8:00 to 9:00, traffic volume from Dagon-Thilawa Road to Phalan village is higher than that of opposite direction. Similarly, in the afternoon as 15:00 to 16:00, traffic volume from Dagon-Thilawa Road to Phalan village is also higher than that of opposite direction. So, it might be assumed that more vehicles are moving from Dagon-Thilawa Road to Phalan village during the monitoring period.

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

From	To	Classification				Total
		Type of vehicles				
		Two-wheeled vehicle and motorcycle sidecar	Four-wheeled light vehicle	Heavy vehicle	Others	
8:00	9:00	66	85	10	0	161
9:00	10:00	72	78	27	0	177
10:00	11:00	30	34	15	1	80
11:00	12:00	35	66	27	5	133
12:00	13:00	47	88	18	0	153
13:00	14:00	39	73	14	0	126
14:00	15:00	34	77	11	0	122
15:00	16:00	24	82	19	3	128
Total		347	583	141	9	1,080

Source: Myanmar Koei International Ltd

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

From	To	Classification				Total
		Type of vehicles				
		Two-wheeled vehicle and motorcycle sidecar	Four-wheeled light vehicle	Heavy vehicle	Others	
8:00	9:00	69	89	31	4	193
9:00	10:00	46	77	28	2	153
10:00	11:00	36	54	19	5	114
11:00	12:00	41	90	30	3	164
12:00	13:00	43	86	18	3	150
13:00	14:00	38	89	18	0	145
14:00	15:00	28	83	21	1	133
15:00	16:00	38	74	44	3	159
Total		339	642	209	21	1,211

Source: Myanmar Koei International Ltd

CHAPTER 3: CONCLUSION AND RECOMMENDATION

The results of the traffic volume show that the number of 4-wheel light vehicles are distinctly and highly utilized in this monitoring period. The number of heavy vehicles is four times and three times significantly lower than that of 4-wheel light vehicles for each direction. It seems that commuting vehicles are more utilized during this monitoring period as compared with construction related vehicles (Heavy vehicles).

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

Thilawa Special Economic Zone

Zone B– Phase 1,2 & 3(Operation phase)

Appendix-G

Waste Disposal Record

(March 2024 to August 2024)

Manifest

C- Slip

* Transportation company to Waste Generator

Date of issuance	(Day Month,Year) 10 Apr 2024	Issuer	(Name&Sign) Hon Ni Tun Aung
Number of issuance	0001 2404 0001		

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

	Kind	Name	Style of packing
Waste	☑Non-Hazardous	SIP Dehydrated Sludge	
	☐Hazardous	Quantity (Unit)	Remark
	☐Others	5,420kg	GNHT-01

Customer code	001	Waste Profile code	NIIN-1006

Trace	PIC (Name & Sign)	Date of Completion
Transportation company	(Name&Sign) Ag Ko Lin AD 2N.6757	(Day Month,Year)
Waste service company	(Name&Sign) Ei Thanda Htun	(Day Month,Year)

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

Myanmar Japan Thilawa Development Limited ★ MJTD

Manifest

C- Slip

* Transportation company to Waste Generator

Date of issuance	(Day Month, Year) 9 May 2024	Issuer	(Name&Sign) Hon Ni Lin Aung Shwe
Number of issuance	0001 2405 0001		

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

Waste	Kind	Name	Style of packing
	☑Non-Hazardous	STP Dehydrated sludge	
	☐Hazardous	Quantity (Unit)	Remark
	☐Others	5,400kg	

Customer code	001	Waste Profile code	NHN - 1006

Trace	PIC (Name & Sign)	Date of Completion
Transportation company	(Name&Sign) Sai min Lad 2N-6757 Sai	(Day Month, Year)
Waste service company	(Name&Sign) Eain Yoon Lei	(Day Month, Year)

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

Myanmar Japan Thilawa Development Limited MJTD

Manifest

C- Slip

* Transportation company to Waste Generator

Date of issuance	(Day Month,Year) 16 July 2024	Issuer	(Name&Sign) Han Ni Tun Aung
Number of issuance	0001 2407 0001		

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

Waste	Kind	Name	Style of packing
	☑Non-Hazardous	SIP Dehydroled Sludge	
	☐Hazardous	Quantity (Unit)	Remark
	☐Others	6,120kg	

Customer code	001	Waste Profile code	NHN_1006

Trace	PIC (Name & Sign)	Date of Completion
Transportation company	(Name&Sign) ZN-6757 Z Z Win	(Day Month,Year) ZN 6957 Z Z Win
Waste service company	(Name&Sign) Yoon Yoon Lei	(Day Month,Year)

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

Myanmar Japan Thilawa Development Limited ☆ MJTD

ငွေလွဲပြောင်း/လက်ခံပြေစာ

၁။ အကြောင်းအရာ ။ ..... Paying for Dumping Service Charges .....

.....

၂။ ငွေပေါင်း(ဂဏန်း) ။ ..... ၇၀၀၀၀/- .....

.....

၃။ ငွေပေါင်း(စာဖြင့်) ။ ..... Seventy Thousand Kyats .....

.....

၆.၃.၂၀၂၄

(လွှဲပြောင်းပေးသူ)

အမည် ..... Kyaw Khine Phyo .....

ရာထူး ..... ဝယ်ယူရေးတာဝန်ခံ .....

နေရာ ..... TSPZ .....

ရက်စွဲ ..... ၆.၃.၂၀၂၄ .....

(လက်ခံသူ)

အမည် .....

ရာထူး ..... ဒေါ်စီးမှူး(သန့်) .....

နေရာ ..... မြို့နယ်စွန့်ပစ်သယ်ယာရေးအဖွဲ့ .....

ရက်စွဲ ..... သန့်ရှင်းမြို့ .....

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Myanmar Japan Thilawa Development Limited MJTD

ငွေလွှဲပြောင်း/လက်ခံပြေစာ

၁။ အကြောင်းအရာ ။ ..... Payment for Dumping Service Charges .....

၂။ ငွေပေါင်း(ဂဏန်း) ။ 70,000/- .....

.....

၃။ ငွေပေါင်း(စာဖြင့်) ။ Seventy Thousand Kyats .....

.....

10.4.2024

(လွှဲပြောင်းပေးသူ)

အမည် ..... Kyaw Myint Phyo .....

ရာထူး ..... Director Engineer .....

နေရာ ..... TSTC .....

ရက်စွဲ ..... 10 April 2024 .....

(လက်ခံသူ)

အမည် .....

ရာထူး ..... ဒု-ဦးစီးမှူး(သန့်) .....

နေရာ ..... မြို့နယ်စည်ပင်သာယာရေးအဖွဲ့ .....
သန်လျင်မြို့

ရက်စွဲ .....

D/Eng/Page Maker/ Form-3

ငွေလွှဲပြောင်း/လက်ခံပြေစာ

၁။ အကြောင်းအရာ ။ ..... Paying for Dumping Service Charges .....

၂။ ငွေပေါင်း(ဂဏန်း) ။ .70000/- .....

.....

၃။ ငွေပေါင်း(စာဖြင့်) ။ .. Seventy Thousand Kyats .....

.....

3.5.2024

(လွှဲပြောင်းပေးသူ)

အမည် ..... Kyaw Khine Phyo .....

ရာထူး ..... ဒါရိုက်တာ .....

နေရာ ..... TSEZ .....

ရက်စွဲ ..... ၃၊၅၊၂၀၂၄ .....

(လက်ခံသူ)

အမည် .....

ရာထူး ..... ဒု-ဦးစီးမှူး(သန့်)

နေရာ .... မြို့နယ်စည်ပင်သာယာရေးအဖွဲ့

ရက်စွဲ .....

ငွေလွှဲပြောင်း/လက်ခံပြေစာ

၁။ အကြောင်းအရာ ။ ..... Paying For Dumping Service Charges .....

၂။ ငွေပေါင်း(ဂဏန်း) ။ 70000/- .....

.....

၃။ ငွေပေါင်း(စာဖြင့်) ။ Seventy Thousand Kyats .....

.....

31.5.2024

(လွှဲပြောင်းပေးသူ)

အမည် ..... Kyaw Khine Phyo ....

ရာထူး ..... ဒုတိယဥက္ကဋ္ဌ .....

နေရာ ..... TSEZ .....

ရက်စွဲ ..... ၃၁.၅.၂၀၂၄ .....

(လက်ခံသူ)

အမည် .....

ရာထူး ..... ဒုတိယဦးစီးမှူး(သန့်)

နေရာ .... မြိုနယ်စည်ပင်သာယာရေးအဖွဲ့

သန်လျင်မြို့

ရက်စွဲ .....

Myanmar Japan Thilawa Development Limited MJTD

ငွေလွှဲပြောင်း/လက်ခံပြေစာ

၁။ အကြောင်းအရာ ။ ..... Paying For Dumping Service Charges .....

၂။ ငွေပေါင်း(ဂဏန်း) ။ 70000/- .....

.....

၃။ ငွေပေါင်း(စာဖြင့်) ။ Seventy Thousand Kyats .....

.....

1.7.2024

(လွှဲပြောင်းပေးသူ)

အမည် Kyaw Khine Phyo

ရာထူး Sr. Assistant Engr.

နေရာ TSPZ

ရက်စွဲ 01 July 2024

(လက်ခံသူ)

အမည် .....

ရာထူး ..... ဒုတိုင်းမှူး(သန့်)

နေရာ မြို့နယ်စွန့်ပစ်သုတ်ရေးအဖွဲ့ သန့်ရှင်းမြို့

ရက်စွဲ .....

ငွေလွှဲပြောင်း/လက်ခံပြေစာ

၁။ အကြောင်းအရာ ။ ..... Paying For Dumping Service Charges .....

၂။ ငွေပေါင်း(ဂဏန်း) ။ ..... 70000/- .....

၃။ ငွေပေါင်း(စာဖြင့်) ။ ..... Seventy Thousand Kyats .....

7.8.2024.

(လွှဲပြောင်းပေးသူ)

အမည် ..... Kyaw Khine Phyo .....

ရာထူး ..... Sr. Executive Engineer .....

နေရာ ..... TBEZ .....

ရက်စွဲ ..... 07.Aug.2024 .....

(လက်ခံသူ)

အမည် .....

ရာထူး ..... ဒု-ဦးစီးမှူး(သန့်)

နေရာ ..... မြို့နယ်စည်ပင်သာယာရေးအဖွဲ့

သန့်ရှင်းမြို့

ရက်စွဲ .....

Thilawa Special Economic Zone

Zone B– Phase 1,2 & 3 (Operation phase)

Appendix-H

Sewage Treatment Plant Monitoring Record

March 2024 to August 2024

Daily Self Monitoring of STP Inlet, Outlet and Aeration

Monthly	Date	Inlet (Zone B)				Inlet -1				Inlet -2				Outlet - 1				Outlet - 2			
		pH	TDS	Tem	COD	pH	TDS	Tem	COD	pH	TDS	Tem	COD	pH	TDS	Tem	COD	pH	TDS	Tem	COD
Standard		6 - 9	2000	≤35	400	6 - 9	2000	≤35	400	6 - 9	2000	≤35	400	6 - 9	2000	≤35	125	6 - 9	2000	≤35	125
Unit		-	mg/L	`C	mg/L	-	mg/L	`C	mg/L	-	mg/L	`C	mg/L	-	mg/L	`C	mg/L	-	mg/L	`C	mg/L
Mar	01-03-24	7.47	307.9	25.7	248	7.14	347	26.4	-	7.16	342.2	26.4	155	6.23	536.2	25.6	28	6.2	528.1	25.6	15
Mar	02-03-24	6.94	272.6	23.8	-	7	320.9	24	-	6.97	320.8	24	-	6.2	535	24	-	7.09	478.1	24	-
Mar	03-03-24	7.03	194	23.9	-	7.1	413.9	24.2	-	7.08	415.3	24.3	-	6.14	505.8	23.8	-	6.9	460	24	-
Mar	04-03-24	7.17	166.1	23.9	-	7.15	393.2	24.6	168	7.4	470.8	24.7	-	6.25	467.5	23.9	22	6.99	467.2	23.6	28
Mar	05-03-24	7.11	281.2	258	561	6.92	353.1	25.8	-	7.05	541.6	25.6	234	6.18	484.9	24.6	36	7.58	526.1	24.3	26
Mar	06-03-24	7.33	386	27	-	6.86	368.6	28.3	175	6.83	367.6	28.5	-	6.36	480.4	29.2	41	7.23	446.3	29.3	32
Mar	07-03-24	7.15	316	26.8	213	7.16	412.3	27.1	-	6.92	437.5	27	84	6.3	459.9	26.7	21	7.4	514.9	27.1	25
Mar	08-03-24	7	290.6	28.5	202	6.85	466.7	30.1	-	6.92	557.4	29.5	299	6.28	470.2	29	15	6.87	530.8	29.2	39
Mar	09-03-24	6.64	284.9	24.9	-	6.72	421.8	24.4	-	6.72	635.6	24.6	-	6.38	457.7	24.7	-	6.99	498	24.5	-
Mar	10-03-24	6.58	540	24.6	-	6.77	671.1	24.8	-	6.78	677.4	24.3	-	6.59	447.3	24.2	-	6.97	478.9	24.8	-
Mar	11-03-24	7.01	269.8	26.1	-	6.77	504.1	26.2	198	6.82	503	26	-	6.74	453.6	26	32	6.92	589.4	26	40
Mar	12-03-24	7.1	259.2	26.3	123	7.25	497.5	27.2	-	7.07	670	27.3	154	6.84	463.4	27.3	30	7.08	476.5	26.8	45
Mar	13-03-24	7.12	386.4	27.8	-	6.95	395.6	28.9	140	7.03	563.9	29.3	-	7.03	441.3	29.1	28	6.76	605.7	28.6	23
Mar	14-03-24	6.96	288.2	27.7	219	6.95	389.1	30.5	-	6.97	395	30.5	225	6.45	441.2	29.8	30	7.15	608.2	29.6	47
Mar	15-03-24	7.09	263.3	27.1	228	6.97	679.9	27.5	-	6.96	667.6	27.4	323	6.55	415	26.8	27	6.51	416.9	26.7	23
Mar	16-03-24	6.04	296.9	22.9	-	6.83	507.4	23.5	-	6.61	437.2	23.6	-	6.47	440.5	23.4	-	6.75	470.9	23.6	-
Mar	17-03-24	6.83	263	23.6	-	6.78	479.1	23.8	-	6.71	420.1	23.9	-	6.46	440.1	23.7	-	6.78	441.4	23.9	-
Mar	18-03-24	6.9	315.2	27.4	-	6.88	300.5	26.8	308	6.82	313.1	26.8	-	6.43	432.7	26.5	15	6.55	460.2	26.3	10
Mar	19-03-24	7.17	533	27.7	165	6.98	769	27.6	-	6.96	765.9	27.4	318	6.82	441.9	26.7	11	7.29	472.9	27.1	14
Mar	20-03-24	7.44	353.6	29.6	-	7.1	442.9	30.1	166	7.11	483.8	30.2	-	6.6	443	30.3	6	6.93	484	29.8	10
Mar	21-03-24	7.06	363.2	28.7	102	6.85	437.3	28.7	-	6.9	446.9	28.9	75	6.68	435.9	28.9	14	6.78	504.4	29.2	16
Mar	22-03-24	7.27	349	27.3	251	7.06	398.2	28.2	-	7.12	394	28.5	140	7.29	522.1	29	20	7.25	519.6	28.9	23
Mar	23-03-24	6.91	287	24.6	-	6.8	510.7	24.3	-	6.8	504.7	24.1	-	7.06	442.4	24.4	-	6.91	522.2	24.3	-
Mar	24-03-24	7.13	566.8	24.6	-	6.93	418.3	24.7	-	6.93	417.5	24.7	-	7.02	528	24.6	-	7.06	530.7	24.9	-
Mar	25-03-24	7.08	333.1	27.5	-	7.39	484.2	27.4	127	7.22	393.3	27.1	-	6.97	447.7	27.5	10	7.42	541.9	28.2	21
Mar	26-03-24	6.41	358.1	29.2	248	6.4	426	29.1	-	6.91	706.7	28.3	213	6.87	477.7	27.7	13	7.06	531.2	27.7	15
Mar	27-03-24	6.84	350.6	25.6	-	7.05	511.3	25.2	-	7.15	509.3	25	-	7.04	564.1	24.9	-	7.09	592.4	24.9	-
Mar	28-03-24	7.04	339.3	26.1	132	7.16	456.8	28.1	-	7.05	508.5	28.2	95	6.85	508.8	28.5	17	6.97	575.4	28.3	23
Mar	29-03-24	7.08	356.2	26.3	288	6.9	546.8	26.7	-	7.11	581.7	26.6	371	7.1	477.5	26.7	23	7.05	563.4	26.9	18
Mar	30-03-24	6.81	310	24.6	-	7.02	357.7	24.5	-	6.95	356.2	24.6		6.99	557	24.5		7.02	556.2	24.5	
Mar	31-03-24	7.06	253.2	26.2	-	7.09	409.4	25.4	-	7.03	377.4	25.2		6.59	600.9	25		6.99	553.5	24.9	
Apr	01-04-24	7.01	229.3	30.6	-	6.94	370	32	99	6.92	359.6	33.2	-	7.02	485.7	32.6	11	7.09	542.5	32.3	15
Apr	02-04-24	6.89	513.2	27.4	344	6.99	603.9	28.2	-	7.01	605	28.4	208	7.08	513.1	28	13	7.07	514.3	28.2	24
Apr	03-04-24	7.07	348.2	29.8	-	6.58	429.7	28.3	289	6.95	551.3	28.2	-	6.84	455.9	27.4	43	7.01	550.5	28.4	30
Apr	04-04-24	7.1	345.7	28.3	377	6.88	440.9	28	-	6.89	441.8	28.3	79	6.92	499.2	28.2	36	7.12	540.1	28.9	32
Apr	05-04-24	6.98	310.7	28.6	599	7.34	533.3	29.3	471	7.1	520.5	29.2	-	7.27	345.6	29.3	45	6.99	606	29.2	19
Apr	06-04-24	6.51	346.6	24.3	-	7.06	394.5	24.3	-	7.02	391.2	24.3	-	7.19	461	24.1	-	7.26	510.9	24.1	-
Apr	07-04-24	7	243.2	25.8	-	7.28	437.3	24.6	-	7.18	453.6	24.3	-	7.07	448.9	24.3	-	7.17	513.1	24.8	-
Apr	08-04-24	6.97	325.2	29.2	-	6.92	379.1	32.4	159	7.02	366.8	31.9	-	7.05	451.4	32.2	41	7.19	520.3	32.2	24
Apr	09-04-24	6.96	279.6	28.7	688	7.33	531	29.8	-	6.98	421.1	29.2	222	7.21	417.8	29.9	49	7.19	498.3	29.8	32
Apr	10-04-24	7.16	305.2	25.7	-	7.22	358.1	25.7	103	7.01	566.7	25.8	-	7.09	455.8	26.8	33	7.33	563.3	26.5	20
Apr	11-04-24	6.7	552.5	28.7	617	6.88	373.8	28.5	-	7.04	423.2	28.4	470	7.09	512.5	28.7	41	7.1	418.3	28.9	30
Apr	12-04-24	7.17	411.2	28.3	597	7.11	723.5	29.6	-	7.24	725.1	29.9	537	6.99	451.2	28.9	45	7	543	28.8	38
Apr	13-04-24	6.8	2879	23.7	-	6.87	430.7	23.6	-	6.88	474.1	23.6	-	6.68	447.2	23.6	-	7.25	553.2	23.7	-
Apr	14-04-24	6.87	2790	23.7	-	6.98	601.3	24.4	-	6.9	668.1	24.2	-	7.05	439.8	24.1	-	7.28	538.2	24.1	-
Apr	15-04-24	7.11	4405	28	-	7.05	336.2	28.8	-	7.06	358.3	28.9	-	7.18	479	28.6	-	7.21	477.6	28.5	-
Apr	16-04-24	7.11	2955	20.1	-	6.99	224.1	20.3	-	6.93	415.2	20.7	-	-	-	-	-	7.29	436.3	20.9	-
Apr	17-04-24	7.09	3677	20.1	-	7.24	215.2	20.3	-	7.06	201.1	20.8	-	-	-	-	-	7.33	402.8	21	-
Apr	18-04-24	7.06	3578	20	-	7.15	260.2	20.6	-	7.23	260.4	21.3	-	-	-	-	-	-	-	-	-
Apr	19-04-24	7.85	1238	29.4	-	7.24	1568	25.6	-	7.24	1568	24.1	-	7.34	443.8	24	-	7.26	459	23.3	-
Apr	20-04-24	7.08	1772	22.5	-	7.24	236.4	21.9	-	6.95	1277	22.5	-	-	-	-	-	-	-	-	-
Apr	21-04-24	6.97	2656	22.6	-	7.34	386.9	22.4	-	7.35	386.3	22.4	-	7.05	418.6	22.3	-	-	-	-	-
Apr	22-04-24	7.04	1227	23.4	-	6.9	939.5	24.9	162	-	-	-	-	6.91	413.3	27.9	18	-	-	-	-
Apr	23-04-24	7.4	451.8	27.6	187	7.3	667.1	28.1	-	7.31	737.6	27.9	97	6.85	521.8	27.5	21	-	-	-	-
Apr	24-04-24	6.99	345.2	22.9	-	6.84	332	22.9	112	6.85	566.7	25	-	6.71	521.9	22.4	36	-	-	-	-
Apr	25-04-24	7.18	393.1	23.7	119	7.27	445.9	24.8	-	6.99	446.8	24.5	32	7.04	528.2	23.3	25	-	-	-	-
Apr	26-04-24	7.37	380.1	25.9	78	7.53	445.7	30.8	-	7.67	459.2	29.4	167	7.12	460.7	29.6	47	-	-	-	-
Apr	27-04-24	7.18	376.5	23.7	-	6.8	512.8	23.6	-	6.8	513.4	23.6	-	7.46	523.7	23.6	-	-	-	-	-
Apr	28-04-24	7.32	416.7	24.3	-	7.04	509.9	23.8	-	7.03	506	23.7	-	7.25	466.3	24	-	-	-	-	-
Apr	29-04-24	7.31	386.7	29.7	-	7.01	493.7	28.1	73	7.11	402	27.4	-	7.04	472.7	29.7	16	7.16	458.2	29.2	-
Apr	30-04-24	7.36	315.7	27.7	111	7.33	656.7	28.4	-	7.3	424.3	27.3	91	7.09	472.4	29.1	35	7.22	451.5	29	-

Myanmar Japan Thilawa Development Limited MJTD

Daily Self Monitoring of STP Inlet, Outlet and Aeration

May	01-05-24	7.13	289.6	22	-	7.04	493.5	22.1	-	7.03	485	21.9	-	6.8	461.2	21.7	-	6.86	462.5	22.8	-
May	02-05-24	7.15	258.8	30	87	6.96	375.9	27.8	-	7.09	374.4	27.9	91	6.79	442.3	28.6	37	-	-	-	-
May	03-05-24	7.39	353	22.2	130	7.31	333.1	22	-	7.3	508.7	22.1	104	7.38	317.6	22.2	24	7.17	483.6	22.5	32
May	04-05-24	7.29	301.3	23.5	-	7.18	308.6	23.6	-	7.17	533.6	23.4	-	7.07	469.7	23.8	-	7.17	490.2	23.3	-
May	05-05-24	7.37	325.2	22.8	-	7.4	417.8	23.1	-	7.41	452.6	23.1	-	6.97	483.1	23.8	-	7.41	492.5	23.4	-
May	06-05-24	7.48	384.3	25.9	-	7.4	366.4	25.2	58	7.11	364.5	25.3	-	7.36	485.2	25.5	21	7.05	483.2	24.9	41
May	07-05-24	7.41	290.6	27.7	139	7.22	396.6	24	-	7.41	389.7	25.2	130	7.22	405.7	25	24	7.16	451.2	23.8	33
May	08-05-24	7.15	346.6	25.9	-	7.21	485.5	25.6	161	7.1	442.9	26	-	7.24	446.3	25.8	21	7.21	467.6	25.7	30
May	09-05-24	7.47	274.9	24.9	152	7.18	421.1	25.7	-	7.16	418.9	25.8	1356	7.09	409.7	25.5	6	7.2	452.4	25	9
May	10-05-24	7.09	234.2	30	176	7.02	324.3	32.8	-	7.04	324.8	32.5	50	7.17	519.3	31.8	7	7.18	520.6	31.1	13
May	11-05-24	6.84	254.2	23.3	-	6.66	373.3	23.3	-	6.66	374.2	23.2	-	7	420.4	23.1	-	7.22	520.6	23.4	-
May	12-05-24	7.46	253	24.1	-	7.14	422.3	23.7	-	7.07	456.9	23.8	-	7.12	394.2	23.8	-	7.13	513.2	23.8	-
May	13-05-24	7.51	210.6	24	-	6.38	382	24.4	248	6.32	354.9	24.5	-	6.68	390.3	24.7	24	7.18	529.1	24.8	9
May	14-05-24	7.24	319.8	22.9	198	7.01	384.8	23.5	-	6.99	368.4	22.8	164	6.99	368.4	23.1	10	7.21	484.7	22.6	5
May	15-05-24	7.09	369.1	26.4	-	7.08	492.4	25.7	182	7.03	552	28.8	-	6.81	370	26.3	15	7.22	494.4	27.4	12
May	16-05-24	7.03	297.7	28	208	7.05	479.4	28	-	7.04	481.9	28.3	241	7	378.8	28	23	7.09	483.3	28.8	24
May	17-05-24	7.03	266.4	26.8	248	7.17	459.1	28.8	-	7.15	460.1	28.7	171	7.09	380.8	28.9	18	7.25	529.6	28.8	28
May	18-05-24	7.01	242.2	24.9	-	7.29	473.5	25.1	-	7.25	478.5	25.4	-	6.98	371.1	25	-	7.19	523.3	25.2	-
May	19-05-24	7.52	242	26.2	-	7.28	378.3	26.3	-	7.06	375.8	24.6	-	6.9	364.3	25.2	-	7.12	510.6	30.1	-
May	20-05-24	7.35	343.7	28.9	-	7.3	437.7	28.1	205	7.12	443.8	28.5	-	6.99	361.2	28.2	27	6.96	509.7	28.1	16
May	21-05-24	7.11	277.2	29.4	238	6.84	409.9	27.8	-	6.92	618.1	27.9	255	6.93	376.4	27.7	51	7.19	534.4	27.8	16
May	22-05-24	7.22	263.8	25.2	-	7.19	456.3	25.9	-	7.08	571.6	25	-	6.96	422.5	24.9	-	6.94	442	25.6	-
May	23-05-24	7.15	302.3	28.3	305	7.25	344	30.6	-	7.21	354	30.4	94	6.83	359.2	30.5	5	6.91	447.9	30.5	20
May	24-05-24	6.97	208.5	26.4	44	6.82	201.3	27.6	-	7.11	304.1	27.6	149	6.87	361	27.1	16	6.84	413.5	27.1	32
May	25-05-24	6.77	553.2	23.7	-	6.9	249	23.7	-	6.94	249.4	23.7	-	6.9	295.8	23.6	-	6.87	354.3	23.7	-
May	26-05-24	6.99	200.9	23.7	-	6.74	147.4	23.5	-	6.95	145.9	23.6	-	6.76	264.6	23.5	-	7.05	327.5	23.6	-
May	27-05-24	7.14	173.9	25.9	-	7.07	168	25.4	39	6.96	165.7	25.4	-	7.09	271.4	25.1	24	6.93	316.3	25.3	28
May	28-05-24	7.03	219.9	26.3	42	6.81	237.3	27.2	-	6.76	219.2	27.7	204	6.84	258.9	27.7	9	6.87	256.2	27.2	16
May	29-05-24	7.27	399.3	27.4	-	6.68	328.2	27.7	260	6.66	449.2	27.3	-	6.81	299	27.3	17	6.76	306.5	27.3	16
May	30-05-24	7.04	433.3	26.9	146	6.96	316.3	27.3	-	6.94	274	26.4	192	6.87	262.9	26.8	37	7.24	352.1	26.6	46
May	31-05-24	7.38	410.7	25.9	217	7.21	508.9	28.4	-	7.12	499.1	26.4	129	6.87	319.8	27	42	7.02	345.4	26.7	43
Jun	01-06-24	7.02	292.6	25	-	6.76	395.3	25.3	-	6.94	406	25.2	-	7.76	101.8	25.1	-	7.98	101.5	25.4	-
Jun	02-06-24	7.22	191.8	24.4	-	7.04	282.5	24	-	6.9	281.4	24	-	6.85	292.6	24	-	7.16	298.5	24.2	-
Jun	03-06-24	7.33	231	26.9	-	7.1	294.1	28.8	93	7.24	291.1	28.1	-	6.09	295.7	28.4	18	7.28	336.8	27.9	20
Jun	04-06-24	7.02	215.5	27.8	153	6.96	343.7	26.3	-	7.01	259	26.4	77	6.91	256.8	27.3	33	7.06	262.1	27	29
Jun	05-06-24	6.82	184.9	27.1	-	6.61	304.1	28.1	163	6.65	299	27.6	-	6.89	232.6	27.4	16	6.87	280.8	27.6	21
Jun	06-06-24	7.01	265.1	26.2	84	6.82	346.1	26.2	-	6.82	346.1	25.9	166	6.74	268	26	28	6.82	287.1	25.8	19
Jun	07-06-24	7.1	210.2	26.6	48	7.07	359.4	27.3	-	7.01	364.2	27.2	68	6.98	296	27	40	7.07	315.5	26.7	34
Jun	08-06-24	6.98	211.6	23.9	-	7.11	263.1	24	-	7.16	257	23.7	-	6.89	222.8	23.6	-	7.2	293.4	23.8	-
Jun	09-06-24	7.13	226.2	23.8	-	6.75	218.4	23.6	-	6.77	466.2	23.6	-	7.11	280.7	23.4	-	7.15	309.9	23.3	-
Jun	10-06-24	7.33	364.2	24.7	-	7.21	345.3	25	79	7.16	347.4	25.1	-	7.35	269.8	24.4	5	7.32	319.8	24.5	6
Jun	11-06-24	7.07	231.4	27.7	140	7.09	360.4	28.2	-	7.13	358.7	28.2	223	6.83	297.7	28.1	9	6.82	352.6	28.1	7
Jun	12-06-24	7.54	454.9	27	-	6.92	622.2	26	-	6.95	631.6	25.2	-	6.88	351.2	25.1	17	7.04	350.9	25.4	17
Jun	13-06-24	7.54	490	25.4	64	6.88	355.9	25.2	94	6.88	409	25.7	140	6.68	374.7	26.4	43	7.73	397.9	25.7	20
Jun	14-06-24	7.58	436.1	25.7	43	7.21	396.5	26.6	-	7.39	405.6	25.3	105	7.18	351.1	25.7	29	7.19	394.8	25.2	28
Jun	15-06-24	7.27	377.4	23.6	-	7.08	406.3	23.6	-	7.16	423.9	23.5	-	6.99	340.5	23.6	-	6.95	342.3	23.7	-
Jun	16-06-24	7.2	345.8	23.9	-	7.2	216.5	23.8	-	7.17	366.8	23.7	-	6.95	302.1	24	-	6.95	354.1	24.4	-
Jun	17-06-24	7.81	437.7	27	-	6.92	268.6	26.4	29	6.86	287.2	26.3	-	6.93	275.7	25.9	13	6.95	357.7	25.3	22
Jun	18-06-24	6.99	232.9	23.8	-	4.88	565	23.9	-	6.81	107.8	24.4	-	6.87	272.8	23.8	-	7.07	322.1	23.7	-
Jun	19-06-24	7.19	387.3	24.6	-	4.58	432.2	24.8	41	7.08	164.8	24.8	-	6.83	211.7	24.7	14	6.96	256.1	24.6	11
Jun	20-06-24	7.18	342.4	27.3	97	7.08	463.2	27.8	-	7.23	233.8	28.1	68	7.23	233.8	28.1	15	7.69	116	28	16
Jun	21-06-24	7.05	216.8	25.8	148	6.92	300.4	27.1	-	6.95	269.4	26.4	110	7.41	111.6	26.9	10	7.49	112.2	26.8	15
Jun	22-06-24	7.04	437	24.5	-	7	328	24.5	-	6.97	325.2	24.4	-	6.82	243.2	24.4	-	6.73	243.8	24.4	-
Jun	23-06-24	6.99	221.4	24.6	-	6.95	259.3	24.5	-	6.94	259.2	24.4	-	6.9	241.5	24.4	-	6.85	316	24.5	-
Jun	24-06-24	6.9	179.3	24.8	-	6.91	243.9	25.7	25	6.92	264.2	25.9	-	7	261.1	25.9	11	7.04	331.5	25.7	4
Jun	25-06-24	6.89	230.6	26.8	40	6.21	420.5	26.6	-	7.13	173.26	26.7	34	6.91	278.7	26.5	13	7.05	300.1	26.7	14
Jun	26-06-24	7.55	414.8	25.2	-	6.71	205	25.1	23	6.77	204.2	27.5	-	6.57	204.2	27.5	13	6.61	280.4	27.5	16
Jun	27-06-24	7.25	367.7	27.2	76	6.86	278.2	26.9	-	6.7	323.9	24.5	140	6.71	182.9	24.5	19	6.76	271.7	24.7	33
Jun	28-06-24	6.79	231.8	25.3	51	6.82	324.6	26.8	-	6.86	321.6	26.4	63	6.63	213.4	26.4	39	6.79	271	26.5	34
Jun	29-06-24	6.78	273.4	25	-	6.76	328.6	24	-	6.8	1102	24.1	-	6.69	316.6	24.2	-	6.9	256	24.2	-
Jun	30-06-24	6.81	195.5	24.2	-	6.78	260.6	24.3	-	6.75	313.1	24.5	-	6.81	264.7	24.4	-	6.86	343.4	24.3	-

Myanmar Japan Thilawa Development Limited MJTD

Daily Self Monitoring of STP Inlet, Outlet and Aeration

Jul	01-07-24	7.65	464.9	25	-	6.7	202.3	26.5	177	6.69	199.7	26.6	-	6.83	367.2	26.3	10	6.8	252.6	26.6	18
Jul	02-07-24	6.72	229.5	26.4	74	6.69	216.4	28.4	-	6.78	209	27.8	114	6.83	209.7	28.3	14	6.73	277.4	28.8	16
Jul	03-07-24	6.77	683.9	21.5	-	6.93	186.6	21.5	34	6.9	187.9	21.9	-	7.49	291	21.9	28	7.03	230.6	21.9	25
Jul	04-07-24	6.84	458	24.8	148	7.04	156.6	24.5	-	6.94	154.1	24.7	51	6.99	208.8	25	16	7.01	205.3	25.1	14
Jul	05-07-24	6.54	470.4	25.7	191	6.85	237.3	26	-	7.16	269.7	25.9	26	7.32	167.3	26.2	12	7	212	26.1	18
Jul	06-07-24	6.49	489.9	23	-	6.62	181.7	23.1	-	6.71	323.8	23.2	-	6.93	455.3	23	-	6.62	182.7	23.1	-
Jul	07-07-24	6.38	497.1	26.2	-	6.42	256.1	26.4	-	6.47	206.7	26.5	-	6.44	218.1	25.8	-	6.54	257.8	26.1	-
Jul	08-07-24	6.42	431.9	26.6	-	6.72	265.4	27.4	19	6.79	310.9	27	-	6.55	240.9	27.6	16	6.76	255.4	26.8	3
Jul	09-07-24	6.64	536.5	24.5	347	6.06	265.1	25.4	-	6.83	347.3	24.9	354	6.77	250.5	24.8	33	7.13	310.5	25.8	9
Jul	10-07-24	6.78	289.3	24.4	-	6.57	304.1	25.1	44	6.68	435.6	25.4	-	6.75	265.5	25.5	7	6.76	317.9	25.3	27
Jul	11-07-24	7.02	260.5	25.3	75	6.64	263	25.6	-	6.72	280.6	25.6	222	6.72	270	25.4	23	6.9	351.1	25.3	21
Jul	12-07-24	7.1	265.5	24.4	101	6.73	246.6	24.6	-	6.71	244.9	24.4	237	6.83	270.4	24.5	30	6.76	340.1	24.3	18
Jul	13-07-24	6.84	232.2	23	-	6.81	189.9	23	-	6.82	195.1	23	-	6.88	230	23	-	6.7	230.9	22.9	-
Jul	14-07-24	7.01	182.7	23.2	-	6.98	343.2	23.4	-	6.96	346.5	23.4	-	6.93	232.9	23.3	-	7.07	369.2	23.2	-
Jul	15-07-24	7.35	323.7	27.4	-	6.92	163	28.8	56	6.9	208.5	28.1	-	6.98	248.2	28.2	19	6.92	294.6	28.7	14
Jul	16-07-24	7.26	295.8	28.3	46	6.94	187	28	-	6.97	182.5	28.1	82	7.06	235.1	27.7	14	6.98	280.2	27.8	13
Jul	17-07-24	7.01	367.6	27.7	-	7.19	415.5	28.3	41	7.21	415.6	28.5	-	6.92	202.2	28.5	23	6.95	238.7	28.4	17
Jul	18-07-24	7.21	346	27.4	80	6.94	265.7	26.6	-	7.19	384.1	26.9	103	7.22	261.1	26.7	41	7.26	305.7	26.3	15
Jul	19-07-24	7.21	163.5	23.3	-	6.85	159.6	23.3	-	6.82	168.6	23.2	-	6.93	187.9	23.3	-	6.83	283.2	23.3	-
Jul	20-07-24	6.83	322.7	23.3	-	6.84	223.8	23.3	-	6.8	222.7	23.4	-	7.04	239.1	23.8	-	7.03	239.6	23.6	-
Jul	21-07-24	6.94	141.2	23.9	-	6.94	211.6	24	-	6.83	198.7	24	-	7.03	175.1	23.2	-	7.07	201.2	23.2	-
Jul	22-07-24	7.3	279.2	24.4	-	6.87	177	24.9	41	6.84	176.8	24.9	-	7.06	184.5	24.5	34	7.09	178.5	24.5	22
Jul	23-07-24	7.58	295.8	25.6	40	7.02	197.8	25.3	-	7.03	175	25.2	55	7.27	142.8	25	24	7.25	221.7	25	33
Jul	24-07-24	6.98	336.3	25.4	-	6.48	210.7	26	250	6.49	215.8	26.8	-	6.99	178.2	26.2	29	7.05	243.7	26.6	15
Jul	25-07-24	7.79	274	25.5	54	7.43	193.9	26.2	-	7.49	326.1	26.8	62	7.29	175.9	27.4	19	7.04	183.6	28.4	21
Jul	26-07-24	7.83	189.3	24.8	107	6.84	134.8	24.2	-	6.83	266.5	24.8	78	7.82	289.5	24.5	10	7.59	265.6	24.8	28
Jul	27-07-24	6.9	112.1	23.6	-	6.81	135.3	23.3	-	6.79	136.4	23.6	-	6.92	210.1	23.6	-	6.86	146.3	23.8	-
Jul	28-07-24	6.98	133.3	22.9	-	6.83	132	22.8	-	6.81	135.2	22.9	-	6.87	118.3	23.2	-	7.16	219.4	23.8	-
Jul	29-07-24	6.82	214.2	24.1	-	6.85	132.8	24.1	30	6.81	136.6	24	-	6.93	154.4	25.6	13	7.12	147.7	24.4	6
Jul	30-07-24	7.4	138.8	24.8	47	6.75	184.6	24.6	-	7.17	185.3	24.2	209	7.24	157.1	24.8	4	7.21	227.8	24.6	2
Jul	31-07-24	7.01	390.3	25.8	-	6.98	163.2	25.8	15	6.71	162.2	25.1	-	6.8	179	25.1	10	6.78	220.4	25.2	24
Aug	01-08-24	7.22	153.5	25.3	32	6.92	199	25.2	-	7.23	200.6	24.6	39	7.16	261.3	24.2	20	7.11	218.7	24.1	30
Aug	02-08-24	6.94	217.4	23.8	93	7.02	314.8	23.8	-	7	315.1	23.9	83	6.71	172.7	23.3	17	7.04	206.7	23.9	11
Aug	03-08-24	7.77	434.9	22.9	-	6.86	239.6	22.9	-	6.87	238.6	22.8	-	7.02	222	23.4	-	6.98	387.8	23.3	-
Aug	04-08-24	7.2	144.3	23.8	-	7.15	203.9	23.7	-	7.06	196.8	23.7	-	6.98	235.7	23.6	-	6.9	391.7	23.5	-
Aug	05-08-24	7.42	621.1	25	-	7.35	293.9	25.4	27	7.32	272	25.3	-	7.37	160.6	25.2	13	7.27	240.6	25	6
Aug	06-08-24	7.4	249.1	23.9	55	6.77	294.8	26.1	-	6.88	302.4	26.1	47	6.99	209.2	25.8	12	6.87	247.6	25.4	22
Aug	07-08-24	6.86	235.4	24.5	-	6.78	211.9	24.9	23	6.88	533.9	25.2	-	6.88	226.4	25.1	14	6.74	293.3	25.2	24
Aug	08-08-24	6.86	218.9	28.7	70	6.25	192.1	28.5	-	6.8	296.8	28.7	77	6.69	224.2	28.4	8	6.81	300.9	28.1	10
Aug	09-08-24	6.72	247.9	26.9	118	6.45	250.4	26.2	-	6.61	247.7	26.5	134	6.8	241.5	26.3	9	6.7	241	26.2	11
Aug	10-08-24	6.93	210.4	23.9	-	7.05	161.79	23.4	-	7.04	163.14	23.4	-	6.77	254.8	23.4	-	No outlet water			-
Aug	11-08-24	7.09	254.8	23.4	-	6.99	274.7	23.2	-	6.99	267.5	23.3	-	7.09	274.1	23.2	-	6.79	273	23.3	-
Aug	12-08-24	6.96	188.2	25.8	-	6.88	376.3	26.5	55	6.9	339	26.9	-	6.75	239.9	27.2	30	6.78	308.6	27.1	14
Aug	13-08-24	6.99	259.6	23.7	195	6.96	324.7	27	-	6.96	321.5	27.2	308	6.89	288.7	27.1	31	6.94	324.2	27.5	20
Aug	14-08-24	7	422.8	23.9	-	7.03	441.6	27.3	96	6.95	347.2	28.2	-	6.68	270.2	26.7	12	6.68	315.4	26.8	10
Aug	15-08-24	7.07	287.2	29.9	155	6.72	270.9	30.5	-	6.71	407.2	29.6	192	6.41	296.2	29.5	16	6.58	316.1	29.8	10
Aug	16-08-24	6.07	279.1	25.5	157	6.67	327.7	25.1	-	6.71	327.5	24.9	606	6.73	310.2	25.4	36	6.73	338	25.3	16
Aug	17-08-24	6.89	244.3	23	-	6.9	481.4	23	-	6.9	478.5	23	-	6.73	232.7	23	-	6.7	339.4	23	-
Aug	18-08-24	6.75	187.7	23.2	-	6.89	483.9	23.1	-	6.86	481.4	23	-	6.67	208.4	23	-	6.73	328.1	23	-
Aug	19-08-24	7.04	206	26.8	-	6.73	266.2	29.7	31	6.71	297.4	29.8	-	6.81	215.3	29.5	12	6.73	303.7	29.4	18
Aug	20-08-24	7.07	302.2	25.6	100	6.92	261.6	25.7	-	6.94	259.1	25.8	112	7.51	387.8	25.8	13	7.61	271.3	26.3	14
Aug	21-08-24	7.03	266.9	24.7	-	6.6	381.1	24.7	55	6.93	235.5	24.7	-	6.65	253.6	24.6	14	6.71	311	24.5	10
Aug	22-08-24	6.89	280.6	23.9	59	6.75	234.4	24.2	-	6.8	257.6	24.5	285	6.88	262.7	24.4	42	6.89	301	24.3	11
Aug	23-08-24	6.81	671.9	26.2	245	7.13	240.9	25.9	-	7.07	242.6	25.9	43	6.87	253.7	25.8	14	6.89	311.2	25.8	13
Aug	24-08-24	6.89	229.1	23.4	-	6.8	281.2	23.4	-	6.8	280.7	23.4	-	6.84	257.5	23.3	-	6.88	348.9	23.3	-
Aug	25-08-24	6.89	210.6	23.5	-	6.95	314.7	23.8	-	6.85	262.1	23.7	-	6.94	233.2	23.7	-	6.87	339.5	23.7	-
Aug	26-08-24	7.09	279.5	25	-	6.98	293.5	25	49	7.04	303.1	25.2	-	6.84	232.6	25.2	14	7.57	343.2	24.6	12
Aug	27-08-24	7.19	290.1	28.8	82	7.03	353.1	26.2	-	7.04	352.4	26.5	79	6.69	287.2	26	16	6.63	288.5	26.3	5
Aug	28-08-24	7.03	280.6	25.5	-	7.05	363.6	25.1	71	7.01	358.1	25.3	-	6.78	257.6	25.4	29	7.1	312.7	25.2	7
Aug	29-08-24	6.95	337.6	25	204	6.82	349	26.9	-	6.71	346.9	26.8	73	6.81	275.3	25.9	33	6.9	326.7	26	11
Aug	30-08-24	6.85	322.9	23.7	74	6.83	294.1	24.1	-	7.01	415.4	24.2	108	6.91	261.6	24.3	28	7.01	324.4	24.4	31
Aug	31-08-24	6.83	311.8	23.9	-	7.2	134.81	24.4	-	7.18	140.64	24.4	-	6.77	237.1	24.5	-	7.09	385.8	24.5	-

Weekly STP Water Analysis Results

Month	Date	Zone A (Inlet) -1			Zone A (Inlet) -2			Outlet - 1								Outlet - 2							
		SS	BOD	T-P	SS	BOD	T-P	SS	BOD	T-N	T-P	O&G	T-Coli	E-Coli	Free Chlorine	SS	BOD	T-N	T-P	O&G	T-Coli	E-Coli	Free Chlorine
Standard		Max 200	Max 200	Max8	Max 200	Max 200	Max8	Max 50	Max 30	Max 80	Max 2	Max 10	Max 400	Max 1000	Max 1	Max 50	Max 30	Max 80	Max 2	Max 10	Max 400	Max 1000	Max 1
Unit		ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	MNP/100ml	MNP/100ml	mg/L	ppm	ppm	ppm	ppm	ppm	MNP/100ml	MNP/100ml	mg/L
Mar	05-03-24	-	-	-	40	120	2.46	5	4	20.3	0.857	0.2	< 1	< 1	0.91	25	3.8	10.9	1.56	0	< 1	< 1	0.11
Mar	12-03-24	40	144	1.74	-	-	-	20	8.7	13.9	1.05	0	1	< 1	0.46	25	8.4	5.4	1.31	0	1	< 1	0.69
Mar	20-03-24	50	135	1.65	-	-	-	15	8.2	12.3	1.42	0.2	1	< 1	0.12	10	7.9	10.6	1.38	0	1	< 1	0.47
Mar	26-03-24	-	-	-	20	138	1.51	10	11	13.5	1.16	0.2	396	318	0.02	5	6.6	4.4	1.23	0.2	< 1	< 1	0.96
Apr	04-04-24	20	138	1.36	-	-	-	5	9.1	13.3	0.977	0	< 1	< 1	0.43	20	8.7	8.4	1.84	0.1	< 1	< 1	0.52
Apr	09-04-24	-	-	-	20	147	1.74	10	8.8	5.5	0.836	0.2	< 1	< 1	0.13	5	8.2	7.4	1.49	0	< 1	< 1	0.3
Apr	24-04-24	93	192	1.86	-	-	-	10	8.2	14.2	0.793	0	< 1	< 1	0.51	-	-	-	-	-	-	-	-
May	02-05-24	50	96	1.49	-	-	-	40	14	9.5	1.9	0.3	1	< 1	0.08	-	-	-	-	-	-	-	-
May	08-05-24	-	-	-	75	129	2.04	16	7.3	17.1	1.17	0.1	3	2	0.01	7	7.1	7.6	1.31	0	1	< 1	0.04
May	15-05-24	20	96	2.79	-	-	-	12	7.2	13.4	1.26	0.1	< 1	< 1	0.16	10	6.1	4	1.39	0	< 1	< 1	0.03
May	21-05-24	-	-	-	13	98	2.58	2	10	9	1.38	0.1	< 1	< 1	0.03	16	7.7	4	1.42	0	< 1	< 1	0.12
May	29-05-24	20	123	1.05	-	-	-	4	7.8	1.3	0.689	0	< 1	< 1	0.47	16	8.3	5.6	1.08	0	< 1	< 1	0.64
Jun	05-06-24	-	-	-	40	177	2.5	15	8.7	7.2	0.652	0	< 1	< 1	2.83	5	7.6	10.8	1.13	0	< 1	< 1	0.09
Jun	10-06-24	30	165	1.57	-	-	-	20	9.8	11.6	0.778	0.1	1	< 1	0.03	10	8.6	9.7	1.19	0	< 1	< 1	0.98
Jun	20-6-24	-	-	-	30	114	1.12	25	9.2	6.6	1.01	0	1	1	0.01	15	8.5	1.6	1.76	0	< 1	< 1	0.19
Jun	26-6-24	20	112	0.807	-	-	-	10	6.7	0.2	0.707	0	< 1	< 1	0.25	10	7	1.02	1.02	0.1	< 1	< 1	0.38
Jul	05-07-24	20	112	1.08	-	-	-	44	9.8	11.2	1.64	0	1	< 1	0.18	46	8.9	9.7	1.29	0	329	329	0.18
Jul	10-07-24	-	-	-	130	297	2.51	5	7.3	7.3	0.963	0	< 1	< 1	0.38	10	7.2	3.3	0.551	0	< 1	< 1	0.22
Jul	17-07-24	20	111	1.12	-	-	-	15	8.6	5.5	0.659	0.2	< 1	< 1	0.19	15	7.9	5.1	1.4	0.1	1	< 1	0.16
Jul	23-07-24	-	-	-	40	111	0.796	20	7.4	5.4	1.05	0.1	< 1	< 1	0.06	10	6.9	5.6	1.03	0	< 1	< 1	0.2
Jul	30-07-24	15	129	0.921	-	-	-	30	8.3	2.8	0.795	0.3	< 1	< 1	0.03	5	7.9	2.7	0.705	0.1	< 1	< 1	0.05
Aug	06-08-24	-	-	-	20	99	1.07	7	7.9	0.5	0.473	0.2	< 1	< 1	0.25	3	7.3	1	0.645	0	1	< 1	0.01
Aug	13-08-24	-	-	-	50	111	1.75	10	8.3	13	0.468	0.1	< 1	< 1	0.29	15	7.9	22	1.1	0	< 1	< 1	0.92
Aug	22-08-24	30	150	0.869	-	-	-	10	9	12.8	0.645	0.2	1	1	0.01	5	7.9	8.8	1.04	0.1	1	1	0.17
Aug	28-08-24	40	108	1.48	-	-	-	20	10	12	0.996	0.1	< 1	< 1	0.02	5	9.3	24	1.07	0.2	< 1	< 1	0.98

Monitoring Parameters Result for STP

Month	Date	Inlet - 1																	Outlet-1																
		Odor	Mercury	Zinc	Arsenic	Chromium	Cadmium	Selenium	Lead	Copper	Barium	Nickel	Silver	Sulphide	Total Cyanide	Hexavalent Chromium (Cr6+)	Fluoride	Phenols	Odor	Mercury	Zinc	Arsenic	Chromium	Cadmium	Selenium	Lead	Copper	Barium	Nickel	Silver	Sulphide	Total Cyanide	Hexavalent Chromium(Cr6+)	Fluoride	Phenols
Standard		-	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	Max 1	Max1	Max0.1	Max20	Max 0.5	-	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	Max 1	Max 1	Max0.1	Max20	Max 0.5
Unit		TON	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	TON	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Mar	05-03-24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	≤ 0.002	0.218	≤ 0.01	≤ 0.002	≤ 0.002	≤ 0.01	≤ 0.002	≤ 0.002	0.016	≤ 0.002	≤ 0.002	< 0.005	0.003	< 0.05	2.283	< 0.002
Apr	24-04-24	8	≤ 0.002	0.04	≤ 0.01	≤ 0.002	≤ 0.002	≤ 0.01	≤ 0.002	≤ 0.002	≤ 0.002	≤ 0.002	≤ 0.002	0.084	0.003	< 0.05	0.378	< 0.002	1.4	≤ 0.002	≤ 0.002	≤ 0.010	≤ 0.002	≤ 0.002	≤ 0.010	≤ 0.002	≤ 0.002	≤ 0.002	≤ 0.002	≤ 0.002	≤ 0.002	0.072	0.002	< 0.05	3.205	< 0.002
May	05-08-24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.4	≤ 0.002	0.082	≤ 0.010	≤ 0.002	≤ 0.002	≤ 0.010	≤ 0.002	≤ 0.002	0.018	≤ 0.002	≤ 0.002	0.011	0.003	< 0.05	4.876	< 0.002
Jun	05-06-24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	≤ 0.002	≤ 0.002	≤ 0.010	≤ 0.002	≤ 0.002	≤ 0.010	≤ 0.002	≤ 0.002	0.016	≤ 0.002	≤ 0.002	0.007	0.002	< 0.05	2.165	0.009
Jul	03-07-24	3	≤ 0.002	0.048	≤ 0.01	≤ 0.002	≤ 0.002	≤ 0.01	≤ 0.002	≤ 0.002	0.02	≤ 0.002	≤ 0.002	0.036	< 0.002	< 0.05	0.851	0.012	2	≤ 0.002	0.124	≤ 0.01	≤ 0.002	≤ 0.002	≤ 0.01	≤ 0.002	≤ 0.002	0.036	≤ 0.002	≤ 0.002	0.016	< 0.002	< 0.05	1.739	< 0.002
Aug	06-08-24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	≤ 0.002	0.012	≤ 0.01	≤ 0.002	≤ 0.002	≤ 0.01	≤ 0.002	≤ 0.002	0.01	≤ 0.002	≤ 0.002	< 0.005	< 0.002	< 0.05	1.53	0.023

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Monitoring Parameters Result for STP

Month	Date	Inlet-2																	Outlet - 2																
		Odor	Mercury	Zinc	Arsenic	Chromium	Cadmium	Selenium	Lead	Copper	Barium	Nickel	Silver	Sulphide	Total Cyanide	Hexavalent Chromium (Cr6+)	Fluoride	Phenols	Odor	Mercury	Zinc	Arsenic	Chromium	Cadmium	Selenium	Lead	Copper	Barium	Nickel	Silver	Sulphide	Total Cyanide	Hexavalent Chromium(Cr 6+)	Fluoride	Phenols
Standard		-	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	Max 1	Max1	Max0.1	Max20	Max 0.5	-	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	Max 1	Max 1	Max0.1	Max20	Max 0.5
Unit		TON	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	TON	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Mar	05-03-24	70	≤ 0.002	0.016	≤ 0.010	≤ 0.002	≤ 0.002	≤ 0.010	≤ 0.002	≤ 0.002	0.012	≤ 0.002	≤ 0.002	0.986	0.002	< 0.05	0.16	0.013	1.4	≤ 0.002	0.044	≤ 0.01	≤ 0.002	≤ 0.002	≤ 0.01	≤ 0.002	≤ 0.002	0.012	≤ 0.002	≤ 0.002	< 0.005	0.002	< 0.05	2.912	< 0.002
Apr	24-04-24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
May	05-08-24	35	≤ 0.002	0.022	≤ 0.01	≤ 0.002	≤ 0.002	≤ 0.01	≤ 0.002	≤ 0.002	0.034	≤ 0.002	≤ 0.002	0.042	0.002	< 0.05	≤ 0.014	< 0.02	1	≤ 0.002	0.018	≤ 0.01	≤ 0.002	≤ 0.002	≤ 0.01	≤ 0.002	≤ 0.002	0.016	≤ 0.002	≤ 0.002	<0.005	0.004	< 0.05	2.773	< 0.002
Jun	05-06-24	8	≤ 0.002	≤ 0.002	≤ 0.01	≤ 0.002	≤ 0.002	≤ 0.01	≤ 0.002	≤ 0.002	0.028	≤ 0.002	≤ 0.002	0.173	0.002	< 0.05	0.488	0.014	1	≤ 0.002	≤ 0.002	≤ 0.01	≤ 0.002	≤ 0.002	≤ 0.01	≤ 0.002	≤ 0.002	0.064	≤ 0.002	≤ 0.002	<0.005	0.004	< 0.05	1.641	0.006
Jul	03-07-24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	≤ 0.002	0.094	≤ 0.01	≤ 0.002	≤ 0.002	≤ 0.01	≤ 0.002	≤ 0.002	0.024	≤ 0.002	≤ 0.002	0.013	0.003	< 0.05	1.617	0.005
Aug	06-08-24	17	≤ 0.002	0.016	≤ 0.01	≤ 0.002	≤ 0.002	≤ 0.01	≤ 0.002	≤ 0.002	0.014	≤ 0.002	≤ 0.002	0.024	< 0.002	< 0.05	0.619	0.006	1	≤ 0.002	0.016	≤ 0.01	≤ 0.002	≤ 0.002	≤ 0.01	≤ 0.002	≤ 0.002	0.008	≤ 0.002	≤ 0.002	0.006	< 0.002	< 0.05	0.798	0.003

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Monitoring Parameters Result for STP

Month	Date	Inlet - 1																	Outlet-1																	
		Odor	Mercury	Zinc	Arsenic	Chromium	Cadmium	Selenium	Lead	Copper	Barium	Nickel	Silver	Sulphide	Total Cyanide	Hexavalent Chromium (Cr6+)	Fluoride	Phenols	Odor	Mercury	Zinc	Arsenic	Chromium	Cadmium	Selenium	Lead	Copper	Barium	Nickel	Silver	Sulphide	Total Cyanide	Hexavalent Chromium(Cr6+)	Fluoride	Phenols
Standard		-	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	Max 1	Max1	Max0.1	Max20	Max 0.5	-	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	Max 1	Max 1	Max0.1	Max20	Max 0.5
Unit		TON	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	TON	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Mar	05-03-24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	≤ 0.002	0.218	≤ 0.01	≤ 0.002	≤ 0.002	≤ 0.01	≤ 0.002	≤ 0.002	0.016	≤ 0.002	≤ 0.002	< 0.005	0.003	< 0.05	2.283	< 0.002
Apr	24-04-24	8	≤ 0.002	0.04	≤ 0.01	≤ 0.002	≤ 0.002	≤ 0.01	≤ 0.002	≤ 0.002	≤ 0.002	≤ 0.002	≤ 0.002	0.084	0.003	< 0.05	0.378	< 0.002	1.4	≤ 0.002	≤ 0.002	≤ 0.010	≤ 0.002	≤ 0.002	≤ 0.010	≤ 0.002	≤ 0.002	≤ 0.002	≤ 0.002	≤ 0.002	≤ 0.002	0.072	0.002	< 0.05	3.205	< 0.002
May	05-08-24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.4	≤ 0.002	0.082	≤ 0.010	≤ 0.002	≤ 0.002	≤ 0.010	≤ 0.002	≤ 0.002	0.018	≤ 0.002	≤ 0.002	0.011	0.003	< 0.05	4.876	< 0.002
Jun	05-06-24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	≤ 0.002	≤ 0.002	≤ 0.010	≤ 0.002	≤ 0.002	≤ 0.010	≤ 0.002	≤ 0.002	0.016	≤ 0.002	≤ 0.002	0.007	0.002	< 0.05	2.165	0.009
Jul	03-07-24	3	≤ 0.002	0.048	≤ 0.01	≤ 0.002	≤ 0.002	≤ 0.01	≤ 0.002	≤ 0.002	0.02	≤ 0.002	≤ 0.002	0.036	< 0.002	< 0.05	0.851	0.012	2	≤ 0.002	0.124	≤ 0.01	≤ 0.002	≤ 0.002	≤ 0.01	≤ 0.002	≤ 0.002	0.036	≤ 0.002	≤ 0.002	0.016	< 0.002	< 0.05	1.739	< 0.002
Aug	06-08-24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	≤ 0.002	0.012	≤ 0.01	≤ 0.002	≤ 0.002	≤ 0.01	≤ 0.002	≤ 0.002	0.01	≤ 0.002	≤ 0.002	< 0.005	< 0.002	< 0.05	1.53	0.023

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Monitoring Parameters Result for STP

Month	Date	Inlet-2																	Outlet - 2																
		Odor	Mercury	Zinc	Arsenic	Chromium	Cadmium	Selenium	Lead	Copper	Barium	Nickel	Silver	Sulphide	Total Cyanide	Hexavalent Chromium (Cr6+)	Fluoride	Phenols	Odor	Mercury	Zinc	Arsenic	Chromium	Cadmium	Selenium	Lead	Copper	Barium	Nickel	Silver	Sulphide	Total Cyanide	Hexavalent Chromium(Cr 6+)	Fluoride	Phenols
Standard		-	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	Max 1	Max1	Max0.1	Max20	Max 0.5	-	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	Max 1	Max 1	Max0.1	Max20	Max 0.5
Unit		TON	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	TON	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Mar	05-03-24	70	≤ 0.002	0.016	≤ 0.010	≤ 0.002	≤ 0.002	≤ 0.010	≤ 0.002	≤ 0.002	0.012	≤ 0.002	≤ 0.002	0.986	0.002	< 0.05	0.16	0.013	1.4	≤ 0.002	0.044	≤ 0.01	≤ 0.002	≤ 0.002	≤ 0.01	≤ 0.002	≤ 0.002	0.012	≤ 0.002	≤ 0.002	< 0.005	0.002	< 0.05	2.912	< 0.002
Apr	24-04-24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
May	05-08-24	35	≤ 0.002	0.022	≤ 0.01	≤ 0.002	≤ 0.002	≤ 0.01	≤ 0.002	≤ 0.002	0.034	≤ 0.002	≤ 0.002	0.042	0.002	< 0.05	≤ 0.014	< 0.02	1	≤ 0.002	0.018	≤ 0.01	≤ 0.002	≤ 0.002	≤ 0.01	≤ 0.002	≤ 0.002	0.016	≤ 0.002	≤ 0.002	<0.005	0.004	< 0.05	2.773	< 0.002
Jun	05-06-24	8	≤ 0.002	≤ 0.002	≤ 0.01	≤ 0.002	≤ 0.002	≤ 0.01	≤ 0.002	≤ 0.002	0.028	≤ 0.002	≤ 0.002	0.173	0.002	< 0.05	0.488	0.014	1	≤ 0.002	≤ 0.002	≤ 0.01	≤ 0.002	≤ 0.002	≤ 0.01	≤ 0.002	≤ 0.002	0.064	≤ 0.002	≤ 0.002	<0.005	0.004	< 0.05	1.641	0.006
Jul	03-07-24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	≤ 0.002	0.094	≤ 0.01	≤ 0.002	≤ 0.002	≤ 0.01	≤ 0.002	≤ 0.002	0.024	≤ 0.002	≤ 0.002	0.013	0.003	< 0.05	1.617	0.005
Aug	06-08-24	17	≤ 0.002	0.016	≤ 0.01	≤ 0.002	≤ 0.002	≤ 0.01	≤ 0.002	≤ 0.002	0.014	≤ 0.002	≤ 0.002	0.024	< 0.002	< 0.05	0.619	0.006	1	≤ 0.002	0.016	≤ 0.01	≤ 0.002	≤ 0.002	≤ 0.01	≤ 0.002	≤ 0.002	0.008	≤ 0.002	≤ 0.002	0.006	< 0.002	< 0.05	0.798	0.003

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Thilawa Special Economic Zone

Zone B– Phase 1,2 & 3 (Operation phase)

Appendix-I

Chemical consumption at Water Sending Station at TSEZ-B

Sludge Generated from Sewage Treatment Plant at TSEZ-A

Water Supply Volume to TSEZ-B

March 2024 to August 2024

Chemical consumption in WSS	
Months- Year	NaOCl (Liters)
Mar-23	629.94
Apr-23	418.93
May-23	601.08
Jun-23	763.06
Jul-23	221.88
Aug-23	264.21
Sep-23	474.00
Oct-23	529.00
Nov-23	764.00
Dec-23	666.00
Jan-24	427.00
Feb-24	412.00
Mar-24	576.24
Apr-24	736.96
May-24	1720.88
Jun-24	2152.08
Jul-24	1442.56
Aug-24	1211.28
Total	**14,011.10**

Note: Above chemical consumption volume are used in Water Sending Station (WSS).

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Generate Sludge Volume

Date	Items	Generated from	Volume (Kg)
Mar-23	Sludge	Sewage Treatment Plant at Zone-A	11380
Apr-23	Sludge	Sewage Treatment Plant at Zone-A	5820
May-23	Sludge	Sewage Treatment Plant at Zone-A	11940
Jun-23	Sludge	Sewage Treatment Plant at Zone-A	0
Jul-23	Sludge	Sewage Treatment Plant at Zone-A	6920
Aug-23	Sludge	Sewage Treatment Plant at Zone-A	6900
Sep-23	Sludge	Sewage Treatment Plant at Zone-A	0
Oct-23	Sludge	Sewage Treatment Plant at Zone-A	6800
Nov-23	Sludge	Sewage Treatment Plant at Zone-A	7140
Dec-23	Sludge	Sewage Treatment Plant at Zone-A	6920
Jan-24	Sludge	Sewage Treatment Plant at Zone-A	0
Feb-24	Sludge	Sewage Treatment Plant at Zone-A	6160
Mar-24	Sludge	Sewage Treatment Plant at Zone-A	0
Apr-24	Sludge	Sewage Treatment Plant at Zone-A	5420
May-24	Sludge	Sewage Treatment Plant at Zone-A	5400
Jun-24	Sludge	Sewage Treatment Plant at Zone-A	0
Jul-24	Sludge	Sewage Treatment Plant at Zone-A	6120
Aug-24	Sludge	Sewage Treatment Plant at Zone-A	6100
Total			93020

Note: TSEZ-B wastewater are treated at Sewage Treatment Plant at Zone-A

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Water Supply Volume in Zone-B

Months - Year	Zone B Locator Water Volume (m3)	Outsource Customer V power (m3)	Total Water Volume (m3)
Mar-23	37761	1045	38806
Apr-23	25100	212	25312
May-23	35272	227	35499
Jun-23	30690	212	30902
Jul-23	20462	318	20780
Aug-23	14357	242	14599
Sep-23	33762	280.12	34042
Oct-23	20036	227.12	20263
Nov-23	34087	227.12	34314
Dec-23	38082	227.12	38309
Jan-24	30931	211.98	31143
Feb-24	31373	166.56	31540
Mar-24	46242	181.69	46424
Apr-24	35616	211.98	35828
May-24	42043	196.84	42240
Jun-24	25033	136.27	25169
Jul-24	23610	151.4	23761
Aug-24	26400	166.6	26567
Total			555497.8

Note: Above mention water supply are distributed from Water Sending Station (WSS)

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