

Thilawa Special Economic Zone (Zone A) Development

# Environmental Monitoring Report (Operation Phase)



Myanmar Japan Thilawa Development Limited.

April 2019

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### 1. Executive Summary

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

The monitoring record from April 2018 to September 2018 according to the Environment Monitoring Plan is submitted in conformity with the provision of Chapter 9.1, Table 9.1-2 and 9.2, Table 9.2-2 Content of the EIA Report of Thilawa SEZ Development Project (Zone A).

### 2. Summary of Monitoring Activities

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

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

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

Report (No.7) is submitted this day attached with Operation Phase implementation schedule. Subsequent Operation Phase reports will be submitted on Bi-Annually.

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

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

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

No.	Parameter	Type of Non-Compliance	Remedial Measures	Remarks	
1	Suspended Solids	Exceed target value	environmental consultant and expert for the	wastewater quality	
2			monitoring points sources to	report in appendix.	

No.	Parameter	Type of Non-Compliance	Remedial Measures	Remarks
	Total Coliform	Exceed target value	analysis the effect and impact	
	Iron	Exceed target value		

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

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

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

Please refer to the attached Environmental Monitoring Form.

### 3. Monitoring Result

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

Monitoring Plan (Operation Phase)

Category	Item	Location	Frequency	Remark
Air Quality	NO <sub>2</sub> , SO <sub>2</sub> , CO, TSP, PM <sub>10</sub>	Representative point inside TSEZ Zone-A area	1 week each in dry and wet season (First 3 years after operation stage)	August 2018, Air quality monitoring report (Bi- Annually)
Water Quality	Water temperature, pH, SS, DO, BOD, COD, T-coliform T-N, T-P, Color and odor, HS, HCN, Oil and grease, Formaldehyde, Phenols, Cresols Free Chlorine, Zinc, Chromium, Arsenic, Copper, Mercury, Cadmium, Barium, Selenium, Lead and Nickel	Discharging points and reference points (6 points) which including outflow of retention pond to the river (1 point) Well in the Monastery (1 point)	Bi-monthly for water, temperature, pH, SS, DO, BOD, COD, T-Coliform, T-N, T-P, Color and odor Bi-annually for all parameters	April 2018 and August 2018, Water and waste water quality monitoring report (Bi- Monthly) June 2018, Water and wastewater quality monitoring report (Bi- Annually)
Waste	Status of non-hazardous waste management Status of hazardous waste management	Each tenant	Twice/ year (Submission of environmental reports by tenants	General waste disposal record (Waste generated from common area of TSEZ and Admin complex)
Noise and Vibration	Noise level at the monastery and residences to check effect of buffer zone for sound proofing to	Each tenant	One time in each dry and wet season (First 3 years after operation stage)	August 2018, Noise and vibration Monitoring Report (Bi-Annually)
Ground Subsidence	Ground elevation Consumption of ground water amount	Representative site (1 point)	Weekly	Refer to Environmental Monitoring form
Offensive Odor	Status offensive odor control by tenants	Each tenant	Twice/ year (Submission of environmental report by tenants)	Refer to Environmental Monitoring form
Bottom Sediment	Combined with water quality monitoring	Same as water quality monitoring	Same as water quality monitoring	Refer to Favir Dimental Monitoring Form

Category	Item	Location	Frequency	Remark	
Hydrological situation	Combined with ground subsidence monitoring	Same as ground subsidence monitoring	Same as ground subsidence monitoring	Refer to Environmental Monitoring Form	
Risk for infectious disease such as AIDS/HIV	Status of measures of infectious disease	Each tenant	Twice/year (Submission of environmental report by tenants)	Refer to Environmental	
Working conditions (including occupational safety)	Prehension of condition of occupational safety and health Prehension of infectious disease	Work site	Twice/year (Submission of environmental report by tenants)	Monitoring form	
Accident	Existence of accident	Work site	As occasion arise	> <b>*</b> ≒	

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





Thilawa Special Economic Zone (Zone A)

Development Project (Operation Phase)

**Environment Monitoring Form** 



### **Environment Monitoring Form**

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

- (1) General
- 1) Phase of the Project
- Please mark the current phase.

☐ Pre-Construction Phase

☐ Construction Phase

☑ Operation Phase

#### 2) Obtainment of Environmental Permits (Not Applicable)

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





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

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

#### (2) Monitoring Results

1) Ambient/ Air Quality - February 2019

#### NO2, SO2, CO, TSP, PM10

Location	Item	Unit	Measured Value (Mean)	Measured Value (Min~Max.)	Country's Standard	Target value to be applied	*Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
Centralized	NO <sub>2</sub> <sup>-1</sup>	ppm	0.061	0.002 - 0.157	Refer to NEQG	< 0.06	Japan		HAZSCANNER, EPAS	
	SO2*2	ppm	0.067	0.00 - 0.662		< 0.04	Japan		HAZSCANNER, EPAS	
Sewage treatment	со	ppm	0.235	0.00 - 0.663		< 10	Japan	1 week each in dry and wet season	HAZSCANNER, EPAS	
plant area	TSP <sup>-3</sup>	mg/m³	0.332	0.008 - 2.988		< 0.33	Thailand		HAZSCANNE1R, EPAS	
	PM10*4	mg/m³	0.121	0.003 -1.087		< 0.12	Thailand		HAZSCANNER, EPAS	

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

<sup>&</sup>quot;Remark: NO<sub>2</sub> is excess than target value due to expected reasons i) affected from the operation and construction activities of Zone A's locators ii) daily human activities in Moegyoe Swan Monastery Compound iii) running vehicle on Dagon-Thilawa road and transportation in and around the monitoring area.



\*2Remark: SO<sub>2</sub> is excess than target value due to expected reasons i) affected from the operation and construction activities of Zone A's locators ii) natural origin such as dust from unpaved vacant area iii) combustion of fuel for vehicles on Dagon-Thilawa road and transportation in and around the monitoring area.

\*3Remark: TSP is excess than target value due to expected reasons i) daily human activities in Moegyoe Swan Monastery Compound ii) running vehicle on Dagon-Thilawa road iii) construction activities of Zone A's locators iv) natural origin such as dust from vacant area v) transportation in and around the monitoring area.

\*4Remark: PM10 is excess than target value due to expected reasons i) daily human activities in Moegyoe Swan Monastery Compound ii) running vehicle on Dagon-Thilawa road iii) construction activities of Zone A's locators iv) natural origin such as dust from vacant area v) transportation in and around the monitoring area.

#### **Complains from Residents**

- Are there any complaints from residents regarding air quality in this monitoring period? <u>□Yes</u>, <u>☑No</u>

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 - October 2018

Measuring Point: Effluent of Wastewater (Thilawa SEZ discharging point which need to be monitored according to EIA are SW-1, SW-5 and SW-6. SW-2, SW-3 and SW-4 natural creek water which are combine all the wastewater from the Local industrial water and domestic water from existing living environment are attach as reference points only. GW-1 is also as reference point for monitoring of existing tube well located in the Monastery compound.)

Are there any effluents to water body in this monitoring period? \( \sqrt{Yes, \sqrt{No}} \) No

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



Location	Item	Unit	Measured Value	Country's Standard*6	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
	pH	-	7.7	6-9	5.0-9.0			Instrument Analysis Method	
	SS <sup>-2</sup>	ppm	516	50	Max.50			APHA 2540D Method	
	DO	ppm	7.22	-		>=4		Instrument Analysis Method	
SW-1	COD(Cr)	ppm	9.2	250	Max.70			APHA 5220D Method	
511-1	BOD	ppm	3.2	50	Max.20		Once in two	APHA-5210B Method	
	T-N	ppm	2	-	Max.80		months	HACH Method 10072	
	T-P	ppm	0.10	2	Max 8			APHA 4500-PE	
	Color	Co.Pt	2.78	-	54			APHA 2120C	
	Odor	Co.Pt	1	-	-			APHA 2150B	
	Total coliforms*3	MPN/100ml	54,000	400	Max.400	7.5×10 <sup>3</sup>		APHA 9221B	
	pH	<b>1</b>	8.9	6-9	5.0-9.0			Instrument Analysis Method	
	SS <sup>2</sup>	ppm	180	50	Max.50			APHA 2540D Method	
	DO	ppm	9.36	-	-	>=4		Instrument Analysis Method	
	COD(Cr)	ppm	11.7	250	Max.70			APHA 5220D Method	
SW-5	BOD	ppm	3.3	50	Max.20		Once in two	APHA-5210B Method	
	T-N	ppm	6	-	Max.80		months	HACH Method 10072	
	T-P	ppm	0.07	2	-			APHA 4500-PE	
	Color	Co.Pt	2.85	-				APHA 2120C	
	Odor	Co.Pt	2		(3)			APHA 2150B	
	Total coliforms*3	MPN/100ml	92,000	400	Max.400	7.5×10³		APHA 9221B	
SW-6	pH		7.1	6-9	5.0-9.0	>=4	Once in two	Instrument Analysis Method	



Location	Item	Unit	Measured Value	Country's Standard*6	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
	SS	ppm	6	50	Max.50		months	APHA 2540D Method	
	DO	ppm	6.49	8	18			Instrument Analysis Method	
	COD(Cr)	ppm	11.1	250	Max.70			APHA 5220D Method	
	BOD	ppm	0.99	50	Max.20			APHA-5210B Method	
	T-N	ppm	13	-	Max.80			HACH Method 10072	
	T-P	ppm	0.2	2	-			APHA 4500-PE	
	Color	Co.Pt	2.52	-	:=:	7.5×10³		APHA 2120C	
	Odor	Co.Pt	2		07			APHA 2150B	
	Total coliforms	MPN/100ml	< 1.8	400	Max.400			APHA 9221B	
SW-2	pН	ě	7.3	6-9	5.0-9.0			Instrument Analysis Method	
(Reference	SS*4	ppm	92	50	Max.50			APHA 2540D Method	
Point)	DO	ppm	9.18	9	1 <del>-</del>	>=4		Instrument Analysis Method	
	COD(Cr)	ppm	13.9	250	Max.70			APHA 5220D Method	
	BOD	ppm	2.07	50	Max.20		Once in two	APHA-5210B Method	
	T-N	ppm	7		Max.80		months	HACH Method 10072	
	T-P	ppm	0.11	2	-			APHA 4500-PE	
	Color	Co.Pt	7.05	-				APHA 2120C	
	Odor	Co.Pt	2	-	-	_ = -		APHA 2150B	
	Total coliforms <sup>*5</sup>	MPN/100ml	> 160,000	400	Max.400			APHA 9221B	
SW-3	рН		7.1	6-9	5.0-9.0		Once in true	Instrument Analysis Method	
Reference Point)	SS <sup>4</sup>	ppm	206	50	Max.50	>=4	Once in two months	APHA 2540D Method	



Location	Item	Unit	Measured Value	Country's Standard*6	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
	DO	ppm	5.24	-	(a)			Instrument Analysis Method	
	COD(Cr)	ppm	14.5	250	Max.70			APHA 5220D Method	
	BOD	ppm	2.55	50	Max.20			APHA-5210B Method	
	T-N	ppm	4	-	Max.80			HACH Method 10072	
	T-P	ppm	0.16	2				APHA 4500-PE	
	Color	Co.Pt	4.91					APHA 2120C	
	Odor	Co.Pt	1.4					APHA 2150B	
	Total coliforms <sup>*5</sup>	MPN/100ml	>160,000	400	Max.400			APHA 9221B	
SW-4	рН	-	7.1	6-9	5.0-9.0			Instrument Analysis Method	
(Reference	SS*4	ppm	232	50	Max.50			APHA 2540D Method	
Point)	DO	ppm	8.23	-		>=4		Instrument Analysis Method	
	COD(Cr)	ppm	9.4	250	Max.70			APHA 5220D Method	
	BOD	ppm	2.62	50	Max.20		Once in two	APHA-5210B Method	
	T-N	ppm	3.0	-	Max.80		months	HACH Method 10072	
	T-P	ppm	0.1	2				APHA 4500-PE	
	Color	Co.Pt	3.9	_				APHA 2120C	
	Odor	Co.Pt	1.4	-				APHA 2150B	
	Total coliforms*5	MPN/100ml	92,000	400	Max.400			APHA 9221B	
GW-1 (Reference Point)	pH SS DO	ppm ppm	7.8 4 7.65	None (Available Guideline value	None (Available Guideline	5.5~9.0 50 >=4	Once in two months	Instrument Analysis Method APHA 2540D Method Instrument Analysis Method	



Location	Item	Unit	Measured Value	Country's Standard*6	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
	COD(Cr)	ppm	6.6	determined by	Value	60		APHA 5220D Method	
	BOD	ppm	1.32	MONREC)	determined by	15		APHA-5210B Method	
	T-N	ppm	6.0		MOI)	0.1		HACH Method 10072	
	T-P	ppm	0.10			0.04		APHA 4500-PE	
	Color	Co.Pt	0.27					APHA 2120C	
	Odor	Co.Pt	1.4					APHA 2150B	
	Total coliforms	MPN/100ml	49			7.5×10³		APHA 9221B	

<sup>\*1</sup>Remark: Referred to the Vietnam Standard (EIA Report), Reference to the Water Quality Monitoring Report, October 2018.

<sup>3</sup>Remark: In SW-1 and SW-5, Total coliform are higher than the target value due to the expected reason-i) the potential expected reason might natural bacteria existed in all area of Zone-A because there are various kind of vegetation and creature such as birds, and small animals in and along the retention canals and retention ponds. Total coliform do not affect human health directly, self-monitoring for E.Coli analysis was carried out to identify health impact by coliform bacteria. As for the result of E.Coli for SW1 was 11 & SW5 was 46 and they were under the reference under target value. It is considered that there is no significant impact to human health.

\*4 Remark: In SW-2, SW-3 and SW-4, the results of SS are higher than the target value due to the expected reason i) delivered from upstream area such as natural origin and wastewater from local industrial zone which outside of Thilawa SEZ ii) influence by water from the downstream of monitoring points due to flow back by tidal fluctuation.

\*5Remark: For reference monitoring points (SW-2, SW-3 and SW-4), the result of total coliforms is higher than the standard due to two expected reason: i) runoff of animal waste from the undeveloped area and delivered from local industrial zone and illegal dumping site from outside of Thilawa SEZ in the upstream area ii) delivered from surrounding area by tidal effect. Total coliform do not affect human health directly, self-monitoring for E.Coli analysis was carried out to identify health impact by coliform bacteria. As for the result of E.Coli SW2 was 2, SW3 was 79 and SW-4 was 63 and they were under the reference under target value. It is considered that there is no significant impact to human

<sup>&</sup>lt;sup>2</sup>Remark: In SW-1 and SW-5, SS are higher than the target value due to the expected reason i) surface water run-off from bare land in Zone A ii) influence by water from the downstream of retention pond (SW-1) due to flow back by tidal fluctuation.



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

#### 2)(b) Water Quality - December 2018

Measuring Point: Effluent of Wastewater

Location	Item	Unit	Measure d Value	Country's Standard	Target value to be applied	*1Referred Internation al Standard	Frequency	Method	Note (Reason of excess of the standard)
	Temperature	°C	28	< 3 (increase)	Max 40			Instrument Analysis Method	
	рН		7.4	6-9	5.0-9.0			Instrument Analysis Method	
	SS	mg/l	8	50	Max 50			APHA 2540D Method	
	DO	mg/l	7.93	3-8	)#c	>=4		Instrument Analysis Method	
	BOD	mg/l	4.88	50	Max 20			APHA-5210B Method	
SW-1	COD(Cr)	mg/l	17.1	250	Max 704*			APHA 5220D Method	
	Total Coliform*1	MPN/10	540	400	Max 400	7.5×10³		APHA-9221B Method	
	T-N	0ml	3.9		Max 80		Twice in one	HACH Method 10072	
	T-P	mg/l	0.065	2			year	APHA 4500-P E Method	
	Color	mg/l	3.21	-	Max 150			APHA-2120C Method	
	Odor	Co.Pt	2					APHA-2150B Method	
	HS*12	Co Pt		1	Max 1			HACH 8131 Method	
	Oil and Grease	mg/l	< 3.1	10	Max 5			APHA-5520B Method	



Location	Item	Unit	Measure d Value	Country's Standard	Target value to be applied	*1Referred Internation al Standard	Frequency	Method	Note (Reason of excess of the standard)
	Formaldehyde	mg/l	0.015	₹9	Max 1			USEPA Method 420.1 Method	
	Phenols	mg/l	< 0.1	0.5	Max 1			APHA 3120B	
	Free Chlorine	mg/l	< 0.1	0.2	Max 1			HACH 8131	
	Zinc	mg/l	≤ 0.002	2	Max 5			APHA-3120B Method	
	Chromium	mg/l	≤ 0.002	0.5	Max 0.5			APHA-3120B Method	
	Arsenic	mg/l	≤ 0.01	0.1	Max 0.25			APHA-3120B Method	
	Copper	mg/l	≤ 0.002	0.5	Max 1			APHA-3120B Method	
	Mercury	mg/l	≤ 0.002	0.01	Max 0.005			APHA-3120B Method	
	Cadmium	mg/l	≤ 0.001	0.1	Max 0.03		Twice in one	APHA-3120B Method	
	Barium	mg/l	0.03	2	Max 1		year	APHA-3120B Method	
	Selenium	mg/l	≤ 0.01	0.1	Max 0.02			APHA-3120B Method	
	Lead	mg/l	≤ 0.002	0.1	Max 0.2			APHA-3120B Method	
	Nickel	mg/l	0.002	0.5	Max 0.2			HACH 8027 Method	
	Cyanide	mg/l	< 0.002	1	Max 1			APHA 4500 CL G Method	
	Sulphide	mg/l	0.010	1	Max 1			HACH 8131 Method	
SW-1	Iron	mg/l	0.276	3.5	Max 3.5			APHA 3120 B ICP Method	
	Total Dissolved Solids	mg/l	364	-	Max 2000			APHA 2540C Method	
	Total Residual Chlorine	mg/l	< 0.1	÷.	Max 0.2			APHA 4500-CI G Method	
	Chromium (Hexavalent)	mg/l	<0.05	0.1	Max 0.1			Spectrometric Method	
HILAWA	Ammonia	mg/l	0.023	10	Max 10			HACH 10205 Method	
15	Fluoride	mg/l	1.231	20	Max 20			APHA 4110 B Method	



Location	Item	Unit	Measure d Value	Country's Standard	Target value to be applied	*1Referred Internation al Standard	Frequency	Method	Note (Reason of excess of the standard)
	Silver		≤0.002	0.5	Max 0.5			APHA 3120 B ICP Method	
SW-5	Temperature	°C	29	< 3 (increase)	Max 40			Instrument Analysis Method	
	pН	-	8.9	6-9	5.0-9.0			Instrument Analysis Method	
	SS <sup>-2</sup>	mg/l	120	50	Mas 50			APHA 2540D Method	
	DO	mg/l	9.05		-			Instrument Analysis Method	L
	BOD	mg/l	12.6	50	Max 20			APHA-5210B Method	
	COD(Cr)	mg/l	27	250	Max 704*	>=4	Twice in one	APHA 5220D Method	
	Total Coliform*3	MPN/10	92,000	400	Max 400		year	APHA-9221B Method	
	T-N	0ml	3	-	Max 80			HACH Method 10072	
	T-P	mg/l	0.117	2	-	7.5×10 <sup>3</sup>		APHA 4500-P E Method	
	Color	mg/l	3.2	12	Max 150			APHA-2120C Method	
	Odor	Co.Pt	1.4	-				APHA-2150B Method	
SW-5	HS	Co Pt		1	Max 1			HACH 8131 Method	
	Oil and Grease	mg/l	<3.1	10	Max 5			APHA-5520B Method	
	Formaldehyde	mg/l	0.094	-	Max 1			USEPA Method 420.1 Method	
	Phenols	mg/l	0.18	0.5	Max 1			APHA 3120B	



Location	Item	Unit	Measure d Value	Country's Standard	Target value to be applied	*1Referred Internation al Standard	Frequency	Method	Note (Reason of excess of the standard)
	Free Chlorine	mg/l	<0.1	0.2	Max 1			HACH 8131	
	Zinc	mg/l	≤0.002	2	Max 5			APHA-3120B Method	
	Chromium	mg/l	≤0.012	0.5	Max 0.5			APHA-3120B Method	
	Arsenic	mg/l	≤0.01	0.1	Max 0.25		Twice in one	APHA-3120B Method	
	Copper	mg/l	≤0.002	0.5	Max 1		year	APHA-3120B Method	
	Mercury	mg/l	≤0.002	0.01	Max 0.005			APHA-3120B Method	
	Cadmium	mg/l	≤0.002	0.1	Max 0.03			APHA-3120B Method	
	Barium	mg/l	0.042	*	Max 1			APHA-3120B Method	
	Selenium	mg/l	≤0.01	0.1	Max 0.02			APHA-3120B Method	
	Lead	mg/l	≤0.002	0.1	Max 0.2			APHA-3120B Method	
	Nickel	mg/l	≤0.014	0.5	Max 0.2			HACH 8027 Method	
	Cyanide	mg/l	0.011	1	Max 1			APHA 4500 CL G Method	
	Sulphide	mg/l	0.191	1	Max 1			HACH 8131 Method	
	Iron-10	mg/l	5.346	3.5	Max 3.5			APHA 3120B ICP Method	
	Total Dissolved Solids	mg/l	182.2	*	Max 2000			APHA 2540C Method	
	Total Residual Chlorine	mg/l	0.1		Max 0.2			APHA 4500-CI G Method	
	Chromium (Hexavalent)	mg/l	< 0.5	0.1	Max 0.1			Spectrometric Method	
	Ammonia	mg/l	0.637	10	Max 10			HACH 10205 Method	
	Fluoride	mg/l	0.415	20	Max 20			APHA 4110 B Method	
THE WAY	Silver	mg/l	≤ 0.002	0.5	Max 0.5			APHA 3120B ICP Method	
AMA DEVE	Temperature .	°C	27	< 3 (increase)	Max 40			Instrument Analysis Method	



Location	Item	Unit	Measure d Value	Country's Standard	Target value to be applied	*1Referred Internation al Standard	Frequency	Method	Note (Reason of excess of the standard)
	pН	-	6.6	6-9	5.0-9.0			Instrument Analysis Method	
-	SS	mg/l	4	50	Mas 30		Twice in one	APHA 2540D Method	
	DO	mg/l	7.23	-		>=4	year	Instrument Analysis Method	
	BOD	mg/l	0.95	50	Max 20			APHA-5210B Method	
SW-6	COD(Cr)	mg/l	11	250	Max 70*			APHA 5220D Method	
	Total Coliform*4	MPN/10	35,000	400	Max 400	7.5×10³		APHA-9221B Method	
	T-N	0ml	13.7	-	Max 80			HACH Method 10072	
	T-P	mg/l	0.338	2	-			APHA 4500-P E Method	
	Color	mg/l	2.07	-	Max 150			APHA-2120C Method	
	Odor	Co.Pt	1	-	-			APHA-2150B Method	
	HS		-	1	Max 1			HACH 8131 Method	
	Oil and Grease	mg/l	< 3.1	10	Max 5			APHA-5520B Method	
	Formaldehyde	mg/l	0.004	_	Max 1			USEPA Method 420.1 Method	
	Phenols	mg/l	<0.1	0.5	Max 1		Twice in one	APHA 3120B	
	Free Chlorine	mg/l	0.1	0.2	Max 1		year	HACH 8131	
	Zinc	mg/l	0.148	2	Max 5			APHA-3120B Method	
	Chromium	mg/l	≤ 0.002	0.5	Max 0.5			APHA-3120B Method	
	Arsenic	mg/l	≤ 0.01	0.1-	Max 0.25			APHA-3120B Method	1
	Copper	mg/l	≤ 0.002	0.5	Max 1			APHA-3120B Method	
	Mercury	mg/l	≤ 0.002	0.01	Max 0.005			APHA-3120B Method	
	Cadmium	mg/1	≤ 0.002	0.1	Max 0.03			APHA-3120B Method	1 1 1 1 1



Location	Item	Unit	Measure d Value	Country's Standard	Target value to be applied	*1Referred Internation al Standard	Frequency	Method	Note (Reason of excess of the standard)
	Barium	mg/l	0.012	The state of	Max 1			APHA-3120B Method	
	Selenium	mg/l	≤ 0.01	0.1	Max 0.02			APHA-3120B Method	
	Lead	mg/l	0.006	0.1	Max 0.2			APHA-3120B Method	
	Nickel	mg/l	0.004	0.5	Max 0.2			HACH 8027 Method	
SW-6	Cyanide	mg/l	< 0.002	1	Max 1			APHA 4500 CL G Method	
	Sulphide	mg/l	< 0.005	1	Max 1			HACH 8131 Method	
	Iron	mg/l	0.12	3.5	Max 3.5			APHA 3120B ICP Method	
	Total Dissolved Solids	mg/l	426	-	Max 2000			APHA 2540C Method	
	Total Residual Chlorine	mg/l	0.1		Max 0.2			APHA 4500-CI G Method	
	Chromium (Hexavalent)	mg/l	< 0.05	0.1	Max 0.5			Spectrometric Method	
	Ammonia	mg/l	<0.007	10	Max 10			HACH 10205 Method	
	Fluoride	mg/l	1.557	20	Max 20			APHA 4110 B Method	
	Silver		≤ 0.002	0.5	Max 0.5			APHA 3120B ICP Method	
SW-2	Temperature	°C	24	< 3 (increase)	Max 40			Instrument Analysis Method	
(Reference	pH	5#5	8.2	6-9	5.0-9.0			Instrument Analysis Method	
Point)	SS	mg/l	46	50	Mas 30			APHA 2540D Method	
	DO	mg/l	8.44	-	-	>=4		Instrument Analysis Method	
	BOD	mg/l	4.63	50	Max 20			APHA-5210B Method	
	COD(Cr)	mg/l	20	250	Max 70**			APHA 5220D Method	
"	Total Coliform <sup>16</sup>	MPN/10	160,000	400	Max 400	7.5×10³		APHA-9221B Method	
	T-N	0ml	1.1		Max 80			HACH Method 10072	



Location	Item	Unit	Measure d Value	Country's Standard	Target value to be applied	*1Referred Internation al Standard	Frequency	Method	Note (Reason of excess of the standard)
	T-P	mg/l	< 0.05	2				APHA 4500-P E Method	
	Color	mg/l	4.13	-	Max 150		Twice in one	APHA-2120C Method	
	Odor	Co.Pt	1.4	-			year	APHA-2150B Method	
	HS	-	-	1	Max 1			HACH 8131 Method	
	Oil and Grease	mg/l	< 3.1	10	Max 5			APHA-5520B Method	
	Formaldehyde	mg/l	0.028		Max 1			USEPA Method 420.1 Method	
	Phenols	mg/l	0.4	0.5	Max 1			APHA 3120B	
	Free Chlorine	mg/l	< 0.1	0.2	Max 1			HACH 8131	
	Zinc	mg/l	≤ 0.002	2	Max 5			APHA-3120B Method	
	Chromium	mg/l	≤ 0.002	0.5	Max 0.5			APHA-3120B Method	
	Arsenic	mg/l	≤ 0.01	0.1	Max 0.25			APHA-3120B Method	
	Copper	mg/l	≤ 0.002	0.5	Max 1			APHA-3120B Method	
SW-2	Mercury	mg/l	≤ 0.002	0.01	Max 0.005			APHA-3120B Method	
(Reference	Cadmium	mg/l	≤ 0.001	0.1	Max 0.03			APHA-3120B Method	
Point)	Barium	mg/l	0.074	-	Max 1		Twice in one	APHA-3120B Method	
	Selenium	mg/l	≤ 0.01	0.1	Max 0.02		year	APHA-3120B Method	
	Lead	mg/l	≤ 0.002	0.1	Max 0.2			APHA-3120B Method	
	Nickel	mg/l	0.006	0.5	Max 0.2			HACH 8027 Method	
	Cyanide	mg/l	0.003	1	Max 1			APHA 4500 CL G Method	
	Sulphide	mg/l	0.033	1	Max 1			HACH 8131 Method	
	Iron	mg/l	1.462	3.5	Max 3.5			APHA 3120B ICP Method	



Location	Item	Unit	Measure d Value	Country's Standard	Target value to be applied	*1Referred Internation al Standard	Frequency	Method	Note (Reason of excess of the standard)
	Total Dissolved Solids*7	mg/l	2768	-	Max 2000			APHA 2540C Method	
	Total Residual Chlorine	mg/l	0.1	-	Max 0.2			APHA 4500-CI G Method	
	Chromium (Hexavalent)	mg/l	< 0.05	0.1	Max 0.5			Spectrometric Method	
	Ammonia	mg/l	0.360	10	Max 10			HACH 10205 Method	
	Fluoride	mg/l	0.490	20	Max 20			APHA 4110 B Method	
	Silver		≤ 0.002	0.5	Max 0.5			APHA 3120B ICP Method	
SW-3	Temperature	°C	24	< 3 (increase)	Max 40			Instrument Analysis Method	
(Reference	рН	-	8.1	6-9	5.0-9.0			Instrument Analysis Method	
Point)	SS*5	mg/l	196	50	Mas 30			APHA 2540D Method	
	DO	mg/l	8.35					Instrument Analysis Method	
	BOD	mg/l	3.55	50	Max 20			APHA-5210B Method	
	COD(Cr)	mg/l	16	250	Max 704*	>=4		APHA 5220D Method	
	Total Coliform <sup>*6</sup>	MPN/10	35,000	400	Max 400		Twice in one	APHA-9221B Method	
	T-N	0ml	2.1	-	Max 80		year	HACH Method 10072	
	T-P	mg/l	< 0.05	2	-	7.5×10³		APHA 4500-P E Method	
	Color	mg/l	3.22	_	Max 150			APHA-2120C Method	
	Odor	Co.Pt	1	2	-			APHA-2150B Method	
	HS	-	2	1	Max 1	.4		HACH 8131 Method	
	Oil and Grease	mg/l	< 3.1	10	Max 5			APHA-5520B Method	
THILDINA DE	Formaldehyde	mg/l	0.014	= =	Max 1			USEPA Method 420.1 Method	
MAD	Phenols	mg/l	< 0.1	0.5	Max 1	3		APHA 3120B	



Location	Item	Unit	Measure d Value	Country's Standard	Target value to be applied	*1Referred Internation al Standard	Frequency	Method	Note (Reason of excess of the standard)
	Free Chlorine	mg/1	< 0.1	0.2	Max 1			HACH 8131	
	Zinc	mg/l	≤ 0.002	2	Max 5			APHA-3120B Method	
	Chromium	mg/l	0.014	0.5	Max 0.5			APHA-3120B Method	
	Arsenic	mg/l	≤ 0.01	0.1	Max 0.25			APHA-3120B Method	
SW-3	Copper	mg/l	≤ 0.002	0.5	Max 1		Twice in one	APHA-3120B Method	
(Reference	Mercury	mg/l	≤ 0.002	0.01	Max 0.005		year	APHA-3120B Method	
Point)	Cadmium	mg/l	≤ 0.002	0.1	Max 0.03			APHA-3120B Method	
	Barium	mg/l	≤ 0.002		Max 1			APHA-3120B Method	
	Selenium	mg/l	≤ 0.01	0.1	Max 0.02			APHA-3120B Method	
	Lead	mg/l	≤ 0.002	0.1	Max 0.2			APHA-3120B Method	
	Nickel	mg/l	0.022	0.5	Max 0.2			HACH 8027 Method	
	Cyanide	mg/l	0.015	1	Max 1			APHA 4500 CL G Method	
	Sulphide	mg/l	0.05	1	Max 1			HACH 8131 Method	
	Iron*8	mg/l	9.232	3.5	Max 3.5			APHA 3120B ICP Method	
	Total Dissolved Solids <sup>7</sup>	mg/l	3540		Max 2000			APHA 2540C Method	
	Total Residual Chlorine	mg/l	0.1		Max 0.2			APHA 4500-CI G Method	
	Chromium (Hexavalent)	mg/l	< 0.05	0.1	Max 0.5			Spectrometric Method	
	Ammonia	mg/l	0.055	10	Max 10			HACH 10205 Method	
	Fluoride	mg/l	≤ 0.014	20	Max 20			APHA 4110 B Method	
	Silver	mg/l	≤ 0.002	0.5	Max 0.5			APHA 3120B ICP Method	
SW-4	Temperature	°C	25	< 3 (increase)	Max 40			Instrument Analysis Method	



Location	Item	Unit	Measure d Value	Country's Standard	Target value to be applied	*1Referred Internation al Standard	Frequency	Method	Note (Reason of excess of the standard)
(Reference	pН	-	8.2	6-9	5.0-9.0			Instrument Analysis Method	
Point)	SS <sup>-3</sup>	mg/l	154	50	Mas 30		Twice in one	APHA 2540D Method	
	DO	mg/l	7.77		*	>=4	year	Instrument Analysis Method	
	BOD	mg/l	2.58	50	Max 20			APHA-5210B Method	
	COD(Cr)	mg/l	16	250	Max 70*			APHA 5220D Method	
	Total Coliform*6	MPN/10	35,000	400	Max 400	7.5×10³		APHA-9221B Method	
	T-N	0ml	1.6	-	Max 80			HACH Method 10072	
	T-P	mg/l	< 0.05	2				APHA 4500-P E Method	
	Color	mg/l	2.63	-	Max 150			APHA-2120C Method	
	Odor	Co.Pt	1.4	-				APHA-2150B Method	
	HS	-		1	Max 1			HACH 8131 Method	
	Oil and Grease	mg/l	< 3.1	10	Max 5			APHA-5520B Method	
	Formaldehyde	mg/l	0.022	-	Max 1			USEPA Method 420.1 Method	
SW-4	Phenols	mg/l	0.17	0.5	Max 1			APHA 3120B	
(Reference	Free Chlorine	mg/l	< 0.1	0.2	Max 1		Twice in one	HACH 8131	
Point)	Zinc	mg/l	≤ 0.002	2	Max 5		year	APHA-3120B Method	
	Chromium	mg/l	0.008	0.5	Max 0.5			APHA-3120B Method	
	Arsenic	mg/l	≤ 0.01	0.1	Max 0.25			APHA-3120B Method	
	Copper	mg/l	≤ 0.002	0.5	Max 1			APHA-3120B Method	
	Mercury	mg/l	≤ 0.002	0.01	Max 0.005			APHA-3120B Method	
重	Cadmium	mg/l	≤ 0.002	0.1	Max 0.03			APHA-3120B Method	





Location	Item	Unit	Measure d Value	Country's Standard	Target value to be applied	*1Referred Internation al Standard	Frequency	Method	Note (Reason of excess of the standard)
	Barium	mg/l	0.058	-	Max 1			APHA-3120B Method	
	Selenium	mg/l	≤ 0.01	0.1	Max 0.02			APHA-3120B Method	
	Lead	mg/l	≤ 0.002	0.1	Max 0.2			APHA-3120B Method	
	Nickel	mg/l	0.014	0.5	Max 0.2			HACH 8027 Method	
	Cyanide	mg/l	0.015	1	Max 1			APHA 4500 CL G Method	
	Sulphide	mg/l	0.018	1	Max 1			HACH 8131 Method	
	Iron*8	mg/l	6.708	3.5	Max 3.5			APHA 3120B ICP Method	
	Total Dissolved Solids <sup>17</sup>	mg/l	3592		Max 2000			APHA 2540C Method	
	Total Residual Chlorine	mg/l	0.1		Max 0.2			APHA 4500-CI G Method	
	Chromium (Hexavalent)	mg/l	< 0.005	0.1	Max 0.5			Spectrometric Method	
	Ammonia	mg/l	0.035	10	Max 10			HACH 10205 Method	
	Fluoride	mg/l	0.423	20	Max 20			APHA 4110 B Method	
	Silver		≤ 0.002	0.5	Max 0.5			APHA 3120B ICP Method	
GW-1	Temperature	°C	32	None	Max 40			Instrument Analysis Method	
(Reference	pH	2	7.7	(Available	5.0-9.0			Instrument Analysis Method	
Point)	SS	mg/l	2	Guideline	Max 30			APHA 2540D Method	
	DO	mg/l	6.51	value		>=4	Twice in one	Instrument Analysis Method	
	BOD	mg/l	1.57	determined	Max 20		year	APHA-5210B Method	
	COD(Cr)	mg/l	7.2	by	Max 704*			APHA 5220D Method	
	Total Coliform*6	MPN/10	920	MONREC)	Max 400	7.5×10³		APHA-9221B Method	
	T-N	0ml	2.1		Max 80			HACH Method 10072	



Location	Item	Unit	Measure d Value	Country's Standard	Target value to be applied	*1Referred Internation al Standard	Frequency	Method	Note (Reason of excess of the standard)
	T-P	mg/l	0.09		-			APHA 4500-P E Method	
	Color	mg/l	0		Max 150			APHA-2120C Method	
	Odor	Co.Pt	1.4		-			APHA-2150B Method	
	HS	-			Max 1			HACH 8131 Method	
	Oil and Grease	mg/l	< 3.1		Max 5			APHA-5520B Method	
	Formaldehyde	mg/l	0.015		Max 1			USEPA Method 420.1 Method	
	Phenols	mg/l	< 0.1		Max 1			APHA 3120B	
	Free Chlorine	mg/l	< 0.1		Max 1			HACH 8131	
	Zinc	mg/l	< 0.002		Max 5			APHA-3120B Method	
	Chromium	mg/l	≤ 0.002		Max 0.5			APHA-3120B Method	
	Arsenic	mg/l	≤ 0.01		Max 0.25			APHA-3120B Method	
	Copper	mg/l	≤ 0.002		Max 1			APHA-3120B Method	
	Mercury	mg/l	≤ 0.002		Max 0.005			APHA-3120B Method	
	Cadmium	mg/l	≤ 0.002		Max 0.03		Twice in one	APHA-3120B Method	
	Barium	mg/l	0.08		Max 1		year	APHA-3120B Method	
GW-1	Selenium	mg/l	≤ 0.01		Max 0.02			APHA-3120B Method	
(Reference	Lead	mg/l	≤ 0.002		Max 0.2			APHA-3120B Method	
Point)	Nickel	mg/l	≤ 0.002		Max 0.2			HACH 8027 Method	
	Cyanide	mg/l	< 0.002		Max 1			APHA 4500 CL G Method	
	Sulphide	mg/1	< 0.005		Max 1			HACH 8131 Method	
	Iron	mg/l	0.474		Max 3.5			APHA 3120B ICP Method	



Location	Item	Unit	Measure d Value	Country's Standard	Target value to be applied	*1Referred Internation al Standard	Frequency	Method	Note (Reason of excess of the standard)
	Total Dissolved Solids	mg/l	1,602		Max 2000			APHA 2540C Method	
	Total Residual Chlorine	mg/l	< 0.1		Max 0.2			APHA 4500-CI G Method	
	Chromium (Hexavalent)	mg/l	< 0.05		Max 0.5			Spectrometric Method	
	Ammonia	mg/l	2.150		Max 10			HACH 10205 Method	
	Fluoride	mg/l	0.059		Max 20			APHA 4110 B Method	
	Silver	mg/l	≤ 0.002		Max 0.5			APHA 3120B ICP Method	

<sup>\*1</sup>Remark: Referred to the Vietnam Standard (EIA Report), Reference to the Water Quality Monitoring Report, December 2018.

"3Remark: In SW-1 and SW-5, Total coliform are higher than the target value due to the expected reason-i) the potential expected reason might natural bacteria existed in all area of Zone A because there are various kinds of vegetation and creature such as birds and small animals in and along the retention canals and retention pond and ii) influence by water from the downstream of retention pond (SW-1). Total coliform do not affect human health directly, self-monitoring for E.Coli analysis was carried out to identify health impact by coliform bacteria. As for the result of E.Coli for SW1 was 4 & SW5 was 7.8 and they were under the reference under target value. It is considered that there is no significant impact to human health.

<sup>4</sup>Remark: In SW-6, coliform was higher than target value due to incidental case because total coliform monitoring results in the previous month was complied with target value and we took countermeasure as additional monitoring. Result of additional monitoring was lower than target value (<1.8).

\*5Remark: For reference monitoring points (SW-3 and SW-4), the result of suspended solids is higher than the target value due to two expected reason: i) delivered from upstream area such as natural origin and wastewater from the other industrial area outside of Thilawa SEZ and ii) influence by water from downstream of monitoring points due to flow back by tidal fluctuation.

"6Remark: For reference monitoring points (SW2, SW-3 and SW-4), the result of total coliform is higher than the target value due to two expected reason: i) runoff of animal waste from the undeveloped area and delivered from local industrial zone and illegal dumping site from outside of Thilawa SEZ in the upstream area ii) delivered from surrounding area by tidal effect. Total coliform do not affect human health directly, self-monitoring for E.Coli analysis was carried out to identify health impact by coliform bacteria. As for

<sup>&</sup>lt;sup>2</sup>Remark: In SW-5, suspended solids are higher than the target value due to the expected reason- i) surface water run-off from bare land in Zone A.



the result of E.Coli for SW2 was 6.8, SW3 was 26 & SW4 was 32 and they were under the reference under target value. It is considered that there is no significant impact to human health.

\*7Remark: For reference monitoring points (SW-2, SW-3 and SW-4), the result of total dissolved solids is higher than the target value due to two expected reason: i) delivered from upstream area such as natural origin and wastewater from the other industrial area outside of Thilawa SEZ and ii) influence by water from downstream of monitoring points due to flow back by tidal fluctuation.

\*Remark: For reference monitoring points (SW-3 and SW-4), the result of iron is higher than the target value due to the expected reason of natural origin (iron can reach out from the soil by run-off).

"9Remark: In GW-1, Total coliform are higher than the target value due to the expected reason- i) the poor maintenance of well which can increase the risk of bacteria and other harmful organisms ii) the well was not operated regularly and didn't use for local people long time. Total coliform do not affect human health directly, self-monitoring for E.Coli analysis was carried out to identify health impact by coliform bacteria. As for the result of E.Coli for GW1 was 11 and it was under the reference under target value. It is considered that there is no significant impact to human health.

\*10Remark: In SW-5, iron result is higher than target value due to expected reason of natural origin (iron can reach out from the soil by run-off).

#### 2)(c) Water Quality - Feb 2019

Measuring Point: Effluent of Wastewater

- Are there any effluents to water body in this monitoring period? 

✓ Yes, □ No

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

Location	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
SW-1	pH	-	7.5	6-9	5.0-9.0			Instrument Analysis Method	
	SS <sup>2</sup>	ppm	640	50	Max.30		Once in two	APHA 2540D Method	
	DO	ppm	6.58			>=4	months	Instrument Analysis Method	
TEN -	COD(Cr)	ppm	20	250	Max.70			APHA 5220D Method	



Location	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reasor of excess of the standard
	BOD	ppm	3.88	50	Max.20			APHA-5210B Method	
	T-N	ppm	13.1	-:	Max.80			HACH Method 10072	
	T-P	ppm	0.26	2				APHA 4500-P E Method	
	Color	Co.Pt	4.61	3	3	7.5×10 <sup>3</sup>		APHA 2120C Method	
	Odor	Co.Pt	1.4					APHA 2150B Method	
	Total coliforms <sup>*3</sup>	MPN/100ml	1,600	400	Max.400			APHA 9221B Method	
SW-5	pH		8.2	6-9	5.0-9.0			Instrument Analysis Method	
	SS <sup>-2</sup>	ppm	98	50	Max.30			APHA 2540D Method	
	DO	ppm	6.63					Instrument Analysis Method	
	COD(Cr)	ppm	52	250	Max.70			APHA 5220D Method	
	BOD	ppm	4.08	50	Max.20	>=4	Once in two	APHA-5210B Method	
	T-N	ppm	1.6	_	Max.80		months	HACH Method 10072	
	T-P	ppm	< 0.05	2	100			APHA 4500-P E Method	
	Color	Co.Pt	3.92	_	1+1			APHA 2120C Method	
	Odor	Co.Pt	2					APHA 2150B Method	
	Total coliforms	MPN/100ml	350	400	Max.400	7.5×10³		APHA 9221B Method	
SW-6	pН	II.	7	6-9	5.0-9.0			Instrument Analysis Method	
	SS	ppm	2	50	Max.30	>=4		APHA 2540D Method	
	DO	ppm	7.14		-		Once in two	Instrument Analysis Method	
	COD(Cr)	ppm	19.6	250	Max.70		months	APHA 5220D Method	
	BOD	ppm	1.71	50	Max.20			APHA-5210B Method	



Location	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
	T-N	ppm	13.1	-	Max.80			HACH Method 10072	
	T-P	ppm	0.985	2		7.5×10³		APHA 4500-P E Method	
	Color	Co.Pt	1.86	-				APHA 2120C Method	
	Odor	Co.Pt	2		-			APHA 2150B Method	
	Total coliforms	MPN/100ml	< 1.8	400	Max.400			APHA 9221B Method	
SW-2	pН		7.8	6-9	5.0-9.0			Instrument Analysis Method	
(Reference	SS	ppm	28	50	Max.30			APHA 2540D Method	
Point)	DO	ppm	3.97		-			Instrument Analysis Method	
	COD(Cr)	ppm	119	250	Max.70			APHA 5220D Method	
	BOD	ppm	15.41	50	Max.20	>=4	Once in two	APHA-5210B Method	
	T-N	ppm	1.9		Max.80		months	HACH Method 10072	
	T-P	ppm	0.289	2	-			APHA 4500-P E Method	
	Color	Co.Pt	21.86	-	-			APHA 2120C Method	
	Odor	Co.Pt	2		5			APHA 2150B Method	
	Total coliforms*5	MPN/100ml	>160,000	400	Max.400			APHA 9221B Method	
SW-3	pH		7.2	6-9	5.0-9.0			Instrument Analysis Method	
(Reference	SS*4	ppm	254	50	Max.30	>=4		APHA 2540D Method	
Point)	DO	ppm	5.63	-	2		Once in two	Instrument Analysis Method	
	COD(Cr)	ppm	27.5	250	Max.70		months	APHA 5220D Method	
1	BOD	ppm	3.79	50	Max.20			APHA-5210B Method	
THE STATE OF THE S	T-N	ppm	9.1	-	Max.80			HACH Method 10072	



Location	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
	T-P	ppm	0.155	2	-			APHA 4500-P E Method	
	Color	Co.Pt	3.49	-				APHA 2120C Method	
	Odor	Co.Pt	2	-	16			APHA 2150B Method	
	Total coliforms <sup>-5</sup>	MPN/100ml	24,000	400	Max.400			APHA 9221B Method	
SW-4	рН	2	7.8	6-9	5.0-9.0			Instrument Analysis Method	
(Reference	SS <sup>-4</sup>	ppm	164	50	Max.30			APHA 2540D Method	
Point)	DO	ppm	5.43	_				Instrument Analysis Method	
	COD(Cr)	ppm	21.1	250	Max.70			APHA 5220D Method	
	BOD	ppm	2.89	50	Max.20	>=4	Once in two	APHA-5210B Method	
	T-N	ppm	4.1		Max.80		months	HACH Method 10072	
	T-P	ppm	0.103	2				APHA 4500-P E Method	
	Color	Co.Pt	2.63	_				APHA 2120C Method	
	Odor	Co.Pt	2	-	2			APHA 2150B Method	
	Total coliforms*5	MPN/100ml	92,000	400	Max.400			APHA 9221B Method	
GW-1	рН	-	7.9			5.5~9.0		Instrument Analysis Method	
(Reference	SS	ppm	4	None	None	50		APHA 2540D Method	
Point)	DO	ppm	5.71	(Available	(Available	>=4		Instrument Analysis Method	
	COD(Cr)	ppm	33.5	Guideline	Guideline	60	Once in two	APHA 5220D Method	
	BOD	ppm	1.56	value	Value	15	months	APHA-5210B Method	
	T-N	ppm	2.5	determined by MONREC)	determined by			HACH Method 10072	
	T-P	ppm	0.063		MOI)	-		APHA 4500-P E Method	



Location	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
	Color	Co.Pt	0.37					APHA 2120C Method	
	Odor	Co.Pt	1.4			-		APHA 2150B Method	
	Total coliforms	MPN/100ml	70			7.5×10³		APHA 9221B Method	

<sup>1\*</sup>Remark: Referred to the Vietnam Standard (EIA Report), Reference to the Water Quality Monitoring Report, Feb 2019.

<sup>2</sup>Remark: In SW-1 and SW-5, suspended solids are higher than the standard due to the expected reason- i) surface water run-off from bare land in Zone A and ii) influence by water from the downstream of retention pond due to flow back by tidal fluctuation.

<sup>3</sup>Remark: In SW1, Total coliform is higher than the standard due to the expected reason i) the potential expected reason might natural bacteria existed in all area of Zone A because there are various kinds of vegetation and creature such as birds, and small animals in and along the retention canals and retention ponds ii) the second suspect might influence by water from the downstream of retention pond (SW1). Total coliform do not affect human health directly, self-monitoring for E.Coli analysis was carried out to identify health impact by coliform bacteria. As for the result of E.Coli for SW1 was 4 and it was under the target value. It is considered that there is no significant impact to human health.

<sup>4</sup>Remark: For reference monitoring points SW3 and SW-4, the result of suspended solids is higher than the standard due to two expected reason: i) delivered from upstream area such as natural origin and wastewater from the local industrial zone which outside of Thilawa SEZ and ii) influence by water from downstream of monitoring points due to flow back by tidal effect.

<sup>15</sup>Remark: For reference monitoring points (SW-2, SW-3 and SW-4), the result of total coliforms is higher than the standard due to two expected reason: i) runoff of animal waste from the undeveloped area and delivered from local industrial zone and illegal dumping site from outside of Thilawa SEZ in the upstream area and ii) delivered from surrounding area by tidal effect. Total coliform do not affect human health directly, self-monitoring for E.Coli analysis was carried out to identify health impact by coliform bacteria. As for the result of E.Coli for SW2 was 4, SW3 was <1.8 & SW4 was 14 and they were under the reference under target value. It is considered that there is no significant impact to human health.





3) Soil Contamination (only operation phase)

#### Situations environmental report from tenants

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

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

Contents of Issues on Soil Contamination	Countermeasures
Regular Soil Contamination Monitoring conducted and attached	
the Report in Appendix.	

#### 4) Noise

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

#### Noise Level (Along the Thilawa Development Road)

Location	Item	Unit	Measured Value (Mean)	Measured Value (Min~Max)	Country's Standard	Target value to be applied	*Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
NV-1	Leq (day)	dB(A)	58	57-59		75		One time each	Sound Level	
INV-1	Leq(eve)	dB(A)	57	52-56	N/A	70		in dry and wet season	Meter	

<sup>\*</sup>Remark: Referred to the Target Noise Standard (Thilawa SEZ Zone-A EIA Report) and Reference to Noise and Vibration Monitoring Report (August 2018)

Noise Level (Living Environment)



Location	Item	Unit	Measured Value (Mean)	Measured Value (Min~Max)	Country's Standard	*Target value to be applied	Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
	Leq (day)	dB(A)	62	60-66		70			6 17 1	
NV-2	Leq(eve)	dB(A)	57	53-59	N/A	65			Sound Level	
	Leq(night)	dB(A)	53	44-57		60		One time each	Meter	
	Leq(day)	dB(A)	47	41-52		70		in dry and		
NV-3	Leq(eve)	dB(A)	50	48-51	N/A	65		wet season	Sound level Meter	
	Leq(night)	dB(A)	45	41-49		60				

<sup>\*</sup>Remark: Referred to the Target Noise Standard (Thilawa SEZ Zone-A EIA Report) and Reference to Noise and Vibration Monitoring Report (August 2018)

#### Complains from Residents

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

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

5) Solid Waste (Disposal from admin complex compound)

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

- Are there any wastes of sludge in this monitoring period? ☑ Yes, □ No

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

No.	Date	Description	No. of Kgs	Remarks
	April 2018	General Waste Disposal	1880	Golden Dowa Eco-system Myanmar Co.,Ltd



No.	Date	Description	No. of Kgs	Remarks		
2 October 2018		General Waste Disposal	2120	Golden Dowa Eco-system Myanmar Co.,Ltc		
3	November 2018	General Waste Disposal	2100	Golden Dowa Eco-system Myanmar Co.,Ltd		
4	December 2018	General Waste Disposal	1320	Golden Dowa Eco-system Myanmar Co.,Ltd		
5	January 2019	General Waste Disposal	2300	Golden Dowa Eco-system Myanmar Co.,Ltd		
6	February 2019	General Waste Disposal	2820	Golden Dowa Eco-system Myanmar Co.,l		
7	March 2019	General Waste Disposal	2260	Golden Dowa Eco-system Myanmar Co.,Ltd		

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

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

#### 6) (a) Ground Subsidence and Hydrology- October 2018

	Water Consumption		Ground Level			
Duration (Week)	Quantity	Unit	Quantity	Unit	Frequency	Note
8-October-2018		m3/week	+7.136	m		
15-October-2018		m3/week	+7.136	m		
22-October-2018	-	m3/week	+7.136	m	Once a week	
31-October-2018	-	m3/week	+7.136	m		

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

### (b) Ground Subsidence and Hydrology- November 2018

Desertion (Moste)	Water Consumption		Ground Level			Nata
Duration (Week)	Quantity	Unit	Quantity	Unit	Frequency	Note
9-November-2018	-	m3/week	+7.136	m		
16-November-2018	=	m3/week	+7.136	m	Once a week	
23- November -2018	-	m3/week	+7.135	m		

<sup>\*</sup> Remarks: Attached ground subsidence monitoring status (Operation Phase) in appendix.

#### (c) Ground Subsidence and Hydrology- Decemberr 2018

Devetion (Mode)	Water Cor	nsumption Ground		Level	T	Note
Duration (Week)	Quantity Unit		Quantity	Unit	Frequency	
3-December-2018	4	m3/week	+7.135	m		
13- December -2018		m3/week	+7.135	m		
20- December -2018	*	m3/week	+7.135	m	Once a week	
27- December -2018		m3/week	+7.135	m		

<sup>\*</sup> Remarks: Attached ground subsidence monitoring status (Operation Phase) in appendix.

#### (d) Ground Subsidence and Hydrology- January 2019

Descrition (Monte)	Water Consumption		Ground Level		F	Note
Duration (Week)	Quantity	Unit	Quantity	Unit	Frequency	Note
8-January-2019	-	m3/week	+7.135	m		
9-January-2018	=	m3/week	+7.135	m	Once a week	
35-January-2018		m3/week	+7.135	m		

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



Ground Subsidence and Hydrology- February 2019

Desertion (Missle)	Water Consumption		Ground Level			Nata
Duration (Week)	Quantity	Unit	Quantity	Unit	Frequency	Note
1-February-2019	-	m3/week	+7.135	m		
8-February-2019		m3/week	+7.134	m		
15-February-2019		m3/week	+7.134	m	Once a week	
29-February-2019	-	m3/week	+7.135	m		

<sup>\*</sup> Remarks: Attached ground subsidence monitoring status (Operation Phase) in appendix.

### (f) Ground Subsidence and Hydrology-March 2019

Duration (Moole)	Water Con	nsumption Ground		Level	Faces	Note
Duration (Week)	Quantity	Unit	Quantity	Unit	Frequency	Note
4-March-2019		m3/week	+7.135	m		
16-March-2019		m3/week	+7.136	m		
23-March-2019		m3/week	+7.136	m	Once a week	
30-March-2019		m3/week	+7.136	m		

<sup>\*</sup> Remarks: Attached ground subsidence monitoring status (Operation Phase) in appendix.

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

#### Complaints from Residents

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

Contents of Complaints from Residents	Countermeasures		



### MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED

### Situations environmental report from tenants Not Applicable at Construction Phase Report

- Are there any serious issues regarding offensive odor in this monitoring period? □ Yes, □ No

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

Contents of Issues on Soil Contamination	Countermeasures		

### 8) Infectious disease, Working Environment, Accident

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

- Are there any incidents regarding Infectious disease, Working Environment, Accident in this monitoring period? 

✓ Yes, □ No

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

Contents of Incidents	Countermeasures			
An accident was occurred on 15th Oct 2018 at in front of Gate-2 outside road of Thilawa SEZ Zone-A.Car and motorbike were drove same direction but car was immediately turned to left side to enter cateen and crashed motorbike. No one got injury and car was little damaged.				
An accident was occurred on 19th November 2018 at front of A-21 site in Thilawa SEZ.Car was from Gate-2 to B-12 site and motorbike was A-21 to Gate-2 (Wrong way). So, car and motorbike were crashed face to face. Motorbike driver got leg injury and car and motorbike were damaged.	1			
An accident was occurred on 4th Dec 2018 at Dagon Thilawa road (Dowa road Junction) outside area of Thilawa SEZ Zone-A.One motorbike was driven Dangon Thilawa road on straight and another motorbike was driven from Dowa road. And then, they crashed face to face. One of the motorbike rider was die and another was little injury. The two motorbikes were damaged.	MjTD take the action as per following:  - We called ambulance car and Traffic Police.  - Send the injured persons to Thanlyin hospital.			
Arrackident was occurred on 16th Dec 2018 behind Plot A-17 on Dagon Thilawa road outside area of Thilawa SEZ Zone A.Long vehicle truck was from MITT and taxi car was from	MjTD take the action as per following:  - Traffic Police arrived and solved it.			



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Contents of Incidents	Countermeasures		
Aung Tha Pyay traffic point. They crashed face to face. No one get injury and both car were damaged. But taxi driver was run away.	- Traffic Police was carried the taxi car and long vehicle to police station		
An accident was occurred on 24th Jan 2019 at back side of Admin Building car parking in Thilawa SEZ Zone A. One car was come from sub gate to Admin Building and another car was going out from car parking. And then, they crashed. Nobody was not injury but one car was damaged.	MjTD take the action as per following: - Negotiate between two parties Remind to drive carefully in furture.		
An accident was occurred on 25th Jan 2019 one motorbike was happened the accident in front of Main Gate on Dagon Thilawa road outside area of Thilawa SEZ A. One person got injury.	MjTD take the action as per following:  - We called ambulance car.  - Send the injured persons to Thanlyin hospital.		
An accident was occurred on 3 <sup>rd</sup> Feb 2019 two motorbikes were happened the accident in front of G&G store on Thilawa Development road outside area of Thilawa SEZ A. They drove same direction from Thilawa Development road. The two persons got small injury and two motorbikes were little damaged.	MjTD take the action as per following:  - Negotiate between two parties.  - Remind to drive carefully in furture and explained the traffic rule.		
An accident was occurred on 8th Feb 2019 a car and motorbike were happened the accident in front of WPP Junction. They drove same direction from Gate-2. A car showed his turning signal light (left side) but motorbike tried to overtake the left side. So, the motorbike was slipped. Two workers from motorbikes was little injury on hand and leg.	" MjTD take the action as per following: - Negotiate between two parties Remind to drive carefully in furture.		
An accident was occurred on 19th Mar 2019 motorbike and car accidence case happened in front of Zone-A Gate-2. Motorbike was drove Thilawa Development road on straight line from Myanmar Marine University and car was drove from opposite direction and suddenly turned left for enter Gate-2. Two person from motorbike got injury.	MjTD take the action as per following:  - We called ambulance car and Traffic Police.  - Send the injured persons to Thanlyin hospital.		

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

**End of Document** 



Thilawa Special Economic Zone (Zone A)

Development Project (Operation Phase)

### Appendix

Water and Waste Water Monitoring Report
October, 2018



# WATER QUALITY MONITORING REPORT FOR DEVELOPMENT OF INDUSTRIAL AREA IN THILAWA SEZ ZONE A (OPERATION STAGE)

(Bi-Monthly Monitoring)

# October 2018 Myanmar Koei International Ltd.



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### **CHAPTER 1: INTRODUCTION**

### 1.1 General

Thilawa Special Economic Zone (SEZ) is located in southern district of Yangon region and about 23 km southeast of Yangon city. As the developer of Thilawa SEZ, Myanmar Japan Thilawa Development Ltd. (MJTD) has a responsibility to carry out regular monitoring in the industrial area of Zone A in accordance with the approved Environmental Impact Assessment (EIA) report and Environmental Management Plan (EMP). MJTD has implemented monitoring various environmental items with the specified time frame to know the environmental conditions in and around the area. As for the monitoring of the water quality, total seven sampling points are set for water quality survey, named SW-1, SW-2, SW-3, SW-4, SW-5, SW-6, and GW-1 have been monitored in Thilawa SEZ and its surrounding area in timely manner. Among the seven locations, SW-1 and SW-5 are main discharging points of Thilawa SEZ and SW-6 is discharging from centralized Sewage Treatment Plant (STP) which is required to monitor by Environmental Monitoring Plan (EMoP) in EIA report of Thilawa SEZ Zone A. The remaining points SW-2, SW-3 and SW-4 are sampled as a reference monitoring for comparison with discharging points and baseline of discharged creek. Moreover, GW-1 is monitored as a reference of existing tube well which located in the monastery compound. Location of sampling points for water quality monitoring is shown in Figure 1.1-1.



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



### **CHAPTER 2: WATER QUALITY MONITORING**

### 2.1 Monitoring Items

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

Water quality sampling was carried out at seven locations. Among the seven locations, water flow measurement was carried out at four locations (SW-1, SW-4, SW-5 and SW-6) where can be measured by Current Meter. Monitoring items and sampling points are summarized in Table 2.1-1.

Table 2.1-1 Monitoring Items for Water Quality

No.	Parameters	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	GW-1	Remarks
1	pH	0	0	0	0	0	0	0	On-site measurement
2	Water temperature	0	0	0	0	0	0	0	On-site measurement
3	DO	0	0	0	0	0	0	0	On-site measurement
4	BOD (5)	0	0	0	0	0	0	0	Laboratory analysis
5	COD (Cr)	0	0	0	0	0	0	0	Laboratory analysis
6	Total nitrogen	0	0	0	0	0	0	0	Laboratory analysis
7	Suspended solids	0	0	0	0	0	0	0	Laboratory analysis
8	Total coliform	0	0	0	0	0	0	0	Laboratory analysis
9	Total phosphorous	0	0	0	0	0	0	0	Laboratory analysis
10	Color	0	0	0	0	0	0	0	Laboratory analysis
11	Odor	0	0	0	0	0	0	0	Laboratory analysis
12	Escherichia Coli (Self-monitoring)	0	0	0	0	0	0	0	Laboratory analysis
13	Flow Rate	0	-	-	0	0	0	-	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
		Coordinate- N-16° 40′ 13.5", E- 96° 16′ 39.8"
1	SW-1	Location - Outlet of Retention Pond
		Survey Item – Surface water sampling and water flow rate measurement.
		Coordinate- N-16° 40′ 20.69", E- 96° 17′ 18.04"
2	SW-2	Location - Upstream of Shwe Pyauk Creek
		Survey Item – Surface water sampling.
		Coordinate- N-16° 40' 5.50", E- 96° 16' 41.60"
3	SW-3	Location - Upstream of Shwe Pyauk Creek, after mixing point of Thilawa SEZ Zone A and Zone B.
		Survey Item – Surface water sampling.
		Coordinate- N-16° 39' 42.84", E- 96° 16' 27.42"
4	SW-4	Location - Downstream of Shwe Pyauk Creek
		Survey Item - Surface water sampling and water flow rate measurement.
		Coordinate- N-16° 40′ 10.7", E- 96° 16′ 22.6"
5	SW-5	Location - Outlet of Retention Canal
		Survey Item – Surface water sampling and water flow rate measurement.
		Coordinate- N-16° 40' 27.13", E- 96° 16' 30.68"
6	SW-6	Location - Outlet from STP to Retention Pond
		Survey Item - Surface water sampling and water flow rate measurement.
		Coordinate- N-16° 40' 25.10", E- 96° 16' 31.70"
7	GW-1	Location - In Moegyoe Swan Monastery
THIL	AW	Survey Item – Ground Water Sampling

Source: Myanmar Koei International Ltd.

### SW-1

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

### SW-2 (Reference Point)

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

### SW-3 (Reference Point)

SW-3 was collected at the upstream of Shwe Pyauk creek after mixing point of Zone A and Zone B, which is flowing from east to west and then entering into the Yangon River. The distance is about 1.2 km downstream of SW-2. This sampling point is located at south of Zone A area and Dagon-Thilawa road. The surrounding area are Zone B in the south and local industrial zone in the east respectively.

### SW-4 (Reference Point)

SW-4 was collected at the downstream of Shwe Pyauk creek, after mixing of discharge water from local industrial zone, construction site of Zone B and Zone A, which is flowing from east to west and then entering into the Yangon River. The distance is about 820 m downstream of SW-3. This sampling point is located at southwest of Zone A area and at the south of Dagon-Thilawa road. The surrounding area are Zone B and local industrial zone in the east respectively.

### SW-5

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

### SW-6

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

### **GW-1** (Reference of Existing Tube Well)

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



### 2.3 Monitoring Method

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

Table 2.3-1 Analytic Method for Water Quality

No.	Parameter	Method
1	Water Temperature	Instrument Analysis Method (Horiba, U-52, Multi Water Quality Checker)
2	pH	Instrument Analysis Method (Horiba, U-52, Multi Water Quality Checker)
3	Dissolved oxygen (DO)	Instrument Analysis Method (Horiba, U-52, Multi Water Quality Checker)
4	BOD (5)	APHA 5210 B (5 days BOD Test)
5	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)
6	Total nitrogen (T-N)	HACH Method 10072(TNT Persulfate Digestion Method)
7	Suspended solids (SS)	APHA 2540D (Dry at 103-105°C Method)
8	Total coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)
9	Total phosphorous (T-P)	APHA 4500-P E (Ascorbic Acid Method)
10	Color	APHA 2120C (Spectrophotometric Method)
11	Odor	APHA 2150 B (Threshold Odor Test)
12	Escherichia Coli	APHA 9221 F (Escherichia Coli Procedure Using Fluorogenic Substrate)
13	Flow Rate	Detection of Electromagnetic Elements (Real-time measurement by UC-200V Digital Current Meters)

Source: Myanmar Koei International Ltd.

### 2.4 Monitoring Period

Water quality and water flow rate monitoring were conducted on 16<sup>th</sup> October 2018 and sampling time is shown in Table 2.4-1 to avoid tidal effect. The tide record for Yangon River, Myanmar on 16<sup>th</sup> August 2018 is shown in Table 2.4-2.

Table 2.4-1 Sampling Time of Each Station

No.	Station	Sampling Time
1	SW-I	16/10/2018 15:07
2	SW-2	16/10/2018 10:05
3	SW-3	16/10/2018 9:01
4	SW-4	16/10/2018 11:14
5	SW-5	16/10/2018 14:44
6	SW-6	16/10/2018 15:31
7	GW-1	16/10/2018 14:10

Source: Myanmar Koei International Ltd.



Table 2.4-2 Tide Record for Yangon River, Myanmar

Date	Time	Height	Tide Conditions
	03:11	1.77	Low Tide
16/10/2010	08:33	5.02	High Tide
16/10/2018	15:51	1.63	Low Tide
	21:25	4.61	High Tide

Source: Myanmar Port Authority, Tide Table for the Yangon River and Elephant Point, 2018.

### 2.5 Monitoring Results

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

# 2.5.1 Results of Water Quality at the Outlet of Sewage Treatment Plant of industrial Area of Thilawa SEZ and at the Point before discharging to Creek

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

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

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

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

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

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

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

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

No.	Parameters	Unit	SW-1	SW-5	SW-6	Target Value (Reference Value for Self- Monitoring)
1	Temperature	,C	34	34	31	≤35
2	рН	-	7.7	8.9	7.1	6.0~9.0
3	Suspended solid (SS)	mg/L	516.00	180.00	6.00	50
4	Dissolved oxygen (DO)	mg/L	7.22	9.36	6.49	-
5	BOD (5)	mg/L	3.20	3.30	0.99	30
6	COD (Cr)	mg/L	9.2	11.7	11.1	125
7	Total coliform	MPN/ 100ml	54,000	92,000	< 1.8	400
8	Total nitrogen (T-N)	mg/L	2.0	6.0	13	80
9	Total phosphorous (T-P)	mg/L	0.10	0.07	0.20	2
10	Color	TCU (True Color Unit)	2.78	2.85	2.52	150
11	Odor	TON (Threshold Odor Number)	1	2	2	.*
12	Escherichia Coli	MPN/100ml	11.0	46.0	< 1.8	(1,000)* (CFU/100ml)
13	Flow Rate	m³/s	0.034	0.071	0.030	

Note: Red color means exceeded value than target value.

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

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

Source: Myanmar Koei International Ltd.

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

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

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

As for the result of total coliform of surface water, results at surface water monitoring points (SW-2, SW-3 and SW-4) exceeded the target value due to two expected reasons; i) runoff of animal waste from the undereloped area and delivered from local industrial zone and illegal dumping site from outside of Thilawa SEZ in the upstream area, and ii) delivered from surrounding area by tidal effect. In addition, the result of

E.Coli of surface water, all of results were under the reference value. Therefore, although the target value of total coliform was exceeded at monitoring point of SW-2, SW-3 and SW-4, but it is considered that there is no significant impact on human health.

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

No.	Parameters	Unit	SW-2	SW-3	SW-4	GW-1	Target Value (Reference Value for Self- Monitoring)
1	Temperature	'C	31	29	30	34	≤ 35
2	рН	=	7.3	7.1	7.1	7.8	6.0~9.0
3	Suspended solid (SS)	mg/L	92.00	206.00	232.00	4.00	50
4	Dissolved oxygen (DO)	mg/L	9.18	5.24	8.23	7.65	
5	BOD (5)	mg/L	2.07	2.55	2.62	1.32	30
6	COD (Cr)	mg/L	13.9	14.5	9.4	6.6	125
7	Total coliform	MPN/ 100ml	>160,000	>160,000	92,000	49	400
8	Total nitrogen (T-N)	mg/L	7.0	4.0	3.0	6.0	80
9	Total phosphorous (T-P)	mg/L	0.11	0.16	0.10	0.10	2
10	Color	TCU (True Color Unit)	7.05	4.91	3.90	0.27	150
11	Odor	TON (Threshold Odor Number)	2	1.4	1.4	1.4	
		MPN/100 ml* (SW)	2.0	79.0	63.0		(1,000)* (CFU/100ml)
12	Escherichia Coli	MPN/100 ml** (GW)				< 1.8	(100)** (MPN/100ml)
13	Flow Rate	m³/s	-	(0)	0.151	-	

Note: Red colors means exceeded value than target value.

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.



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

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

### CHAPTER 3: CONCLUSION AND RECOMMENDATIONS

As for the result of SS and total coliform the results at the outlet of the centralized STP (SW-6) complied with the target value of both of them. It may prove that effluent from each locator was treated well by the STP. On the other hand, parameters of SS, total coliform at retention pond (SW-1) and at retention canal (SW-5) were exceeded the target values in this period for main discharging points of Thilawa SEZ Zone A. In addition, according to the result of self-monitoring of E. coli at retention pond (SW-1) and at retention canal (SW-5), result were under the reference value. Therefore, although the target value of total coliform was exceeded at monitoring point SW-1 and SW-5, but it is considered that there is no significant impact on human health.

As for parameters of SS and total coliform in surface water were exceeded the target values at reference monitoring points. The expected reasons for exceeding the target values of SS are delivered from upstream area such as natural origin and wastewater from local industrial zone which outside of Thilawa SEZ. The expected reasons for exceeding the target values of total coliform are by natural origin (natural bacteria existed). As mentioned in Section 2.5.2, the result of self-monitoring of E. coli at SW-2, SW-3 and SW-4 were under the reference value. Therefore, although the target value of total coliform was exceeded at reference monitoring point, but it is considered that there is no significant impact on human health. However, it cannot reach to the conclusion of what is the reason to be exceeded the target values, thus the continuous monitoring and yearly trend analysis will be necessary to carry out based on the rainy and dry season data.

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

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

End of the Document



# APPENDIX-1 FIELD SURVEY PHOTOS



### FOR DISCHARGING POINTS OF THILAWA SEZ ZONE A





Surface water sampling and onsite measurement at SW-1





Surface water sampling and onsite measurement at SW-5





Surface water sampling and onsite measurement at SW-6



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



Surface water sampling and onsite measurement at SW-2



Surface water sampling and onsite measurement at SW-3



Surface water sampling and onsite measurement at SW-4





Ground water sampling and onsite measurement at GW-1



# APPENDIX-2 LABORATORY RESULTS



### FOR DISCHARGING POINTS AND AFTER CENTRALIZED STP



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Lot No E1. Thilawa SEZ Zone A, Yangon Region, Myanmar.
Phone No Fax No: (+95) 1 2309051



Report No.: GEM-LAB-201811002

Revision No.: 1

Report Date: 2 November, 2018

Application No.: 0049-C001

### Analysis Report

Client Name : Myanmar Koei International LTD (MKI)

Address ; No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa Township, Yangon. Myanmar.

Project Name : MJTD

Sample Description

Sample Name : MKI-SW-1-1016 Sampling Date : 16 October, 2018

Sample No. : W-1810151 Sampling By : Customer

Waste Profile No. : - Sample Received Date : 16 October, 2018

No.	Parameter	Parameter Method		Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	516.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	3.20	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	9.2	0.7
4	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	2.0	0.0
5	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.10	0.05
6	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	54000	1.8
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	2.78	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	1	0

Remark : LOQ - Limit of Quantitation

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

Wastewater, 22nd edition

Analysed By:

Ni Ni Aye Lwin

Assistant supervisor

Tomoya Suzuki

Approved By :







Report No.: GEM-LAB-201811003

Revision No.: 1

Report Date: 2 November, 2018

Application No.: 0049-C001

### Analysis Report

Client Name : Myanmar Koei International LTD (MKI)

Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa Township, Yangon. Myanmar.

Project Name : MJTD

Sample Description

Sample Name : MKI-SW-5-1016 Sampling Date : 16 October, 2018

Sample No. : W-1810152 Sampling By : Customer

Waste Profile No. : - Sample Received Date : 16 October, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	ss	APHA 2540D (Dry at 103-105'C Method)	mg/l	180.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	3.30	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	11.7	0.7
4	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	6.0	0.0
5	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.07	0.05
6	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	92000	1.8
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	2.85	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	2	0

Remark : LOQ - Limit of Quantitation

APHA - American Public Health Association (APHA), the American Water Works Association (AWWA), and the Water Environment Federation (WBF), Standard Methods for the Examination of Water and

Wastewater, 22nd edition

Analysed By :

Ni Ni Aye Lwin

Assistant supervisor

Tomoya Suzuki







Report No.: GEM-LAB-201811004

Revision No.: 1

Report Date: 2 November, 2018

Application No.: 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)

Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa Township, Yangon. Myanmar.

Project Name : MJTD

Sample Description

Sample Name : MKI-SW-6-1016 Sampling Date : 16 October, 2018

Sample No. : W-1810153 Sampling By : Customer

Waste Profile No. : - Sample Received Date : 16 October, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/i	6.00	
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	0.99	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	11.1	0.7
4	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	13.0	0.0
5	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.20	0.05
6	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	< 1.8	1.8
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	2.52	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	2	0

Remark : LOQ -

LOQ - Limit of Quantitation

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

Wastewater, 22nd edition

Analysed By:

Ni Ni Aye Lwin

Assistant supervisor

Approved By :

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Tomoya Suzuki



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



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Doc No: GEM-LB-R004E/00
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Report No.: GEM-LAB-201811005

Revision No.: 1

Report Date: 2 November, 2018

Application No.: 0049-C001

### Analysis Report

Client Name : Myanmar Koei International LTD (MKI)

Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa Township, Yangon. Myanmar.

Project Name : MJTD

Sample Description

Sample Name : MKI-SW-2-1016 Sampling Date : 16 October, 2018

Sample No. : W-1810154 Sampling By : Customer

Waste Profile No. : - Sample Received Date : 16 October, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/I	92.00	_
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	2.07	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/I	13.9	0.7
4	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	7.0	0.0
5	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.11	0.05
6	Total Coliform	APHA 92218 (Standard Total Coliform Fermentation Technique)	MPN/100ml	> 160000	1.8
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	7.05	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	2	0
9	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
10	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.012	0.002

Remark : LOQ - Limit of Quantitation

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

Wastewater, 22nd edition

Analysed By:

Ni Ni Aye Lwin

Assistant supervisor

Approved By :

學 月 百

Tomoya Suzuki





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Report No.: GEM-LAB-201811006

Revision No.: 1

Report Date: 2 November, 2018

Application No.: 0049-C001

### Analysis Report

Client Name : Myanmar Koei International LTD (MKI)

Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa Township, Yangon. Myanmar.

Project Name : MJTD

Sample Description

Sample Name : MKI-SW-3-1016 Sampling Date : 16 October, 2018

Sample No. : W-1810155 Sampling By : Customer

Waste Profile No. : - Sample Received Date : 16 October, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	206.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	2.55	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	14.5	0.7
4	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	4.0	0.0
5	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.16	0.05
6	Total Coliform	APHA 9221B (Standard Total Colliform Fermentation Technique)	MPN/100ml	> 160000	1.8
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	4.91	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	1.4	0.0
9	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
10	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.022	0.002

Remark : LOQ - Limit of Quantitation

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

Wastewater, 22nd edition

Analysed By:

Ni Ni Aye Lwin

Assistant supervisor

Approved By:

Tomoya Suzuki







Doc No: GEM-LB-R004E/00 Page5of10

Report No.: GEM-LAB-201811007

Revision No.: 1

Report Date: 2 November, 2018

Application No.: 0049-C001

### Analysis Report

Client Name

: Myanmar Koei International LTD (MKI)

Address

No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa Township, Yangon. Myanmar.

Project Name

MJTD

. .

Sample Description

Sample Name

MKI-SW-4-1016

Sampling Date: 16 October, 2018

Sample No.

Waste Profile No.

Oil and Grease

Chromium

10

W-1810156

Sampling By: Customer

Sample Received Date: 16 October, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	232.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	2.62	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	9.4	0.7
4	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	3.0	0.0
5	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.10	0.05
6	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	92000	1.8
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	3.90	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	1.4	0.0

APHA 5520B (Partition-Gravimetric Method)

APHA 3120 B (Inductively Coupled Plasma (ICP) Method)

Remark LOQ - Limit of Quantitation

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

Wastewater, 22nd edition

Analysed By:

Ni Ni Aye Lwin

Assistant supervisor

Approved By:

mg/l

mg/l

< 3.1

0.022

3.1

0.002

Tomoya Suzuki







motivate our planet Doc No: GEM-LB-R004E/00 Page9of10

Report No.: GEM-LAB-201811010

Revision No.: 1

Report Date: 2 November, 2018

Application No.: 0049-C001

### Analysis Report

Client Name : Myanmar Koei International LTD (MKI)

Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa Township, Yangon. Myanmar.

Project Name : MJTD

Sample Description

Sample Name : MKI-GW-1-1016 Sampling Date : 16 October, 2018

Sample No. : W-1810159 Sampling By : Customer

Waste Profile No. : - Sample Received Date : 16 October, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	ss	APHA 2540D (Dry at 103-105'C Method)	mg/l	4.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	1.32	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	6.6	0.7
4	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/I	6.0	0.0
5	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.10	0.05
6	Total Coliform	APHA 92218 (Standard Total Coliform Fermentation Technique)	MPN/100ml	49	1.8
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	0.27	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	1.4	0

Remark : LOQ - Limit of Quantitation

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

Wastewater, 22nd edition

Analysed By:

Ni Ni Aye Lwin

Assistant supervisor

Approved By:

Tomoya Suzuki



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



### FOR DISCHARGING POINTS AND AFTER CENTRALIZED STP



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-201810236

Revision No. : 1

Report Date: 30 October, 2018 Application No.: 0049-C001

### Analysis Report

Client Name : Myanmar Koei International LTD (MKI)

Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.

Project Name : MJTD

Sample Description

Sample Name : MKI-SW-1-1016 Sampling Date : 16 October, 2018

Sample No. : W-1810141 Sampling By : Customer

Waste Profile No. : - Sample Received Date : 16 October, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	11.0	1.8

Remark LOQ - Limit of Quantitation

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

Analysed By:

Ni Ni Aye Lwin Assistant supervisor LAB GEM Approved By:







Report No.: GEM-LAB-201810237

Revision No.: 1

Report Date: 30 October, 2018

Application No.: 0049-C001

### **Analysis Report**

Client Name : Myanmar Koei International LTD (MKI)

Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.

Project Name : MJTD

Sample Description

Sample Name : MKI-SW-5-1016 Sampling Date : 16 October, 2018

Sample No. : W-1810142 Sampling By : Customer

Waste Profile No. : - Sample Received Date : 16 October, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	46.0	1.8
-					

Remark

LOQ - Limit of Quantitation

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

Analysed By:

Ni Ni Aye Lwin

Assistant supervisor

Approved By :







Report No.: GEM-LAB-201810238

Revision No.: 1

Report Date: 30 October, 2018 Application No.: 0049-C001

### Analysis Report

Client Name : Myanmar Koei International LTD (MKI)

Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.

Project Name : MJTD

Sample Description

Sample Name : MKI-SW-6-1016 Sampling Date : 16 October, 2018

Sample No. : W-1810143 Sampling By : Customer

Waste Profile No. - Sample Received Date : 16 October, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	< 1.8	1.8
			A =1 =		
		7.1W = 4 4			-

Remark : LOQ - Limit of Quantitation

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

Analysed By:

Ni Ni Aye Lwin Assistant supervisor IAR

GEM

Approved By :



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



GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD. Lot No E1. Thilawa SE2 Zone A, Yangon Region, Myanmar. Phone No Fax No: (+95) 1 2309051



Report No.: GEM-LAB-201810239

Revision No.: 1

Report Date: 30 October, 2018 Application No.: 0049-C001

### Analysis Report

Client Name

: Myanmar Koei International LTD (MKI)

Address

No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.

Project Name

MJTD

Sample Description

Sample Name

: MKI-SW-2-1016

Sampling Date: 16 October, 2018

Sample No.

W-1810144

Sampling By : Customer

Waste Profile No. Sample Received Date: 16 October, 2018

Parameter	Method	Unit	Result	LOQ
Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	2.0	1.8
		Carrier Street		- CW
1 2 m				
		-		
	Escherichia Coli	Escherichia Coli  APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	Escherichia Coli APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate MPN/100ml	Escherichia Coli APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate MPN/100ml 2.0

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:

Ni Ni Aye Lwin Assistant supervisor

Approved By:







Report No.: GEM-LAB-201810240

Revision No.: 1

Report Date: 30 October, 2018 Application No.: 0049-C001

Analysis Report

Client Name

: Myanmar Koei International LTD (MKI)

Address

No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.

Project Name

MJTD

Sample Description

Sample Name

MKI-SW-3-1016

Sampling Date: 16 October, 2018

Sample No.

: W-1810145

Sampling By : Customer

Waste Profile No.

Sample Received Date: 16 October, 2018

Parameter	Method	Unit	Result	LOQ
Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	79.0	1.8
	ETATION TO			

Remark

LOQ - Limit of Quantitation

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

Analysed By:

Ni Ni Aye Lwin

Assistant supervisor

Approved By:

Kei Nagata

Senior Manager







Report No.: GEM-LAB-201810241

Revision No. : 1

Report Date: 30 October, 2018

Application No.: 0049-C001

### **Analysis Report**

Client Name

: Myanmar Koei International LTD (MKI)

Address

: No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.

Project Name

MJTD

Sample Description

Sample Name

MKI-SW-4-1016

Sampling Date: 16 October, 2018

Sampling By : Customer

Sample No. Waste Profile No. W-1810146

Sample Received Date: 16 October, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	63.0	1.8
-					
-		- Van			1

Remark

LOQ - Limit of Quantitation

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

Analysed By:

Ni Ni Aye Lwin

Assistant supervisor

Approved By:







Report No.: GEM-LAB-201810244

Revision No.: 1

Report Date: 30 October, 2018 Application No.: 0049-C001

### **Analysis Report**

Client Name : Myanmar Koei International LTD (MKI)

Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.

Project Name : MJTD

Sample Description

Sample Name : MKI-GW-1-1016 Sampling Date : 16 October, 2018

Sample No. : W-1810149 Sampling By : Customer

Waste Profile No. : - Sample Received Date : 16 October, 2018

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

Remark LOQ - Limit of Quantitation

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

Analysed By:

Ni Ni Aye Lwin Assistant supervisor GEM

Approved By:





## Thilawa Special Economic Zone (Zone A) **Development Project (Operation Phase)**

### **Appendix**

Water and Waste Water Monitoring Report December, 2018



# WATER QUALITY MONITORING REPORT FOR DEVELOPMENT OF INDUSTRIAL AREA IN THILAWA SEZ ZONE A (OPERATION STAGE)

(Bi-Annually Monitoring)

December 2018 Myanmar Koei International Ltd.



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### **CHAPTER 1: INTRODUCTION**

### 1.1 General

Thilawa Special Economic Zone (SEZ) is located in southern district of Yangon region and about 23 km southeast of Yangon city. As the developer of Thilawa SEZ, Myanmar Japan Thilawa Development Ltd. (MJTD) has a responsibility to carry out regular monitoring in the industrial area of Zone A in accordance with the approved Environmental Impact Assessment (EIA) report and Environmental Management Plan (EMP). MJTD has implemented monitoring various environmental items with the specified time frame to know the environmental conditions in and around the area. As for the monitoring of the water quality, total seven sampling points are set for water quality survey, named SW-1, SW-2, SW-3, SW-4, SW-5, SW-6, and GW-1 have been monitored in Thilawa SEZ and its surrounding area in timely manner. Among the seven locations, SW-1 and SW-5 are main discharging points of Thilawa SEZ and SW-6 is discharging from centralized Sewage Treatment Plant (STP) which is required to monitor by Environmental Monitoring Plan (EMoP) in EIA report of Thilawa SEZ Zone A. The remaining points SW-2, SW-3 and SW-4 are sampled as a reference monitoring for comparison with discharging points and baseline of discharged creek. Moreover, GW-1 is monitored as a reference of existing tube well which located in the monastery compound. Location of sampling points for water quality monitoring is shown in Figure 1.1-1.

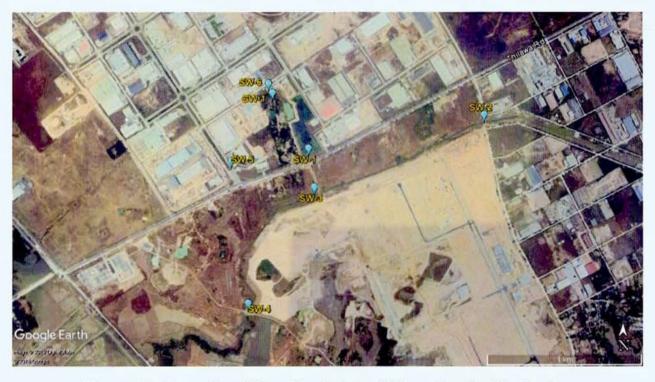


Figure 1.1-1 Location of Sampling Points of Water Quality Monitoring



### **CHAPTER 2: WATER QUALITY MONITORING**

### 2.1 Monitoring Items

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

Water quality sampling was carried out at seven locations. Among the seven locations, water flow measurement was carried out at two locations (SW-4 and SW-6) where can be measured by Current Meter. Monitoring items and sampling points are summarized in Table 2.1-1.

Table 2.1-1 Monitoring Items for Water Quality

No.	Parameters	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	GW-1	Remarks
1	рН	0	0	0	0	0	0	0	On-site measurement
2	Water Temperature	0	0	0	0	0	0	0	On-site measurement
3	DO	0	0	0	0	0	0	0	On-site measurement
4	BOD (5)	0	0	0	0	0	0	0	Laboratory analysis
5	COD (Cr)	0	0	0	0	0	0	0	Laboratory analysis
6	Total Nitrogen	0	o	0	0	0	0	0	Laboratory analysis
7	Suspended Solids	. 0	0	0	0	. 0	0	0	Laboratory analysis
8	Total Coliform	0	0	0	0	0	0	0	Laboratory analysis
9	Total Phosphorous	0	0	0	0	0	0	0	Laboratory analysis
10	Color	0	0	0	0	0	0	0	Laboratory analysis
11	Odor	0	0	0	0	0	0	0	Laboratory analysis
12	Oil and Grease	0	0	0	0	0	0	0	Laboratory analysis
13	Mercury	0	0	0	0	0	0	0	Laboratory analysis
14	Zinc	0	0	0	0	0	0	0	Laboratory analysis
15	Arsenic	0	0	0	0	0	0	0	Laboratory analysis
16	Chromium	0	0	0	0	0	0	0	Laboratory analysis
17	Cadmium	0	0	0	0	0	0	0	Laboratory analysis
18	Selenium	0	0	0	0	0	0	0	Laboratory analysis
19	Lead	0	0	0	0	0	0	0	Laboratory analysis
20	Copper	0	0	0	0	0	0	0	Laboratory analysis
21	Barium	0	0	0	0	0	0	0	Laboratory analysis
22	Nickel	0	0	0	0	0	0	0	Laboratory analysis
23	Cyanide	0	0	0	0	0	0	0	Laboratory analysis
24	Free Chlorine	0	0	0	0	0	0	0	Laboratory analysis
25	Sulphide	0	0	0	O	0	0	0	Laboratory analysis
26	Formaldehyde	G	0	0	0	0	0	0	Laboratory analysis
27	Phenol	0	0	0	0	0	0	. 0	Laboratory analysis
28	Iron	0	0	0	0	0	0	0	Laboratory analysis
29	Total Dissolved Solids	0	0	0	0	0	0	0	Laboratory analysis
30	Total Residual Chlorine	0	0	0	0	0	0	0	Laboratory analysis
31	Chromium (Hexavalent)	0	0	0	0	0	0	0	Laboratory analysis
32	Ammonia	0	0	0	0	0	0	0	Laboratory analysis
33	Fluoride	0	0	0	0	0	0	0	Laboratory analysis
34	Silver	0	0	0	0	0	0	0	Laboratory analysis
35	Escherichia Coli (Self- monitoring)	0	0	0	0	0	O	0	Laboratory analysis
36	Flow Rate	120	120	- 2	Ö	-	0		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
		Coordinate- N-16° 40′ 13.5″, E- 96° 16′ 39.8″
1	SW-1	Location - Outlet of Retention Pond
		Survey Item – Surface water sampling.
		Coordinate- N-16° 40′ 20.69″, E- 96° 17′ 18.04″
2	SW-2	Location - Upstream of Shwe Pyauk Creek
		Survey Item – Surface water sampling.
		Coordinate- N-16° 40′ 5.50″, E- 96° 16′ 41.60″
3	SW-3	Location - Upstream of Shwe Pyauk Creek, after mixing point of Thilawa SEZ Zone A and Zone B.
		Survey Item – Surface water sampling.
	SW-4	Coordinate- N-16° 39' 42.84", E- 96° 16' 27.42"
4		Location - Downstream of Shwe Pyauk Creek
		Survey Item – Surface water sampling and water flow rate measurement.
		Coordinate- N-16° 40′ 10.7″, E- 96° 16′ 22.6″
5	SW-5	Location - Outlet of Retention Canal
		Survey Item – Surface water sampling.
		Coordinate- N-16° 40′ 27.13″, E- 96° 16′ 30.68″
6	SW-6	Location - Outlet from STP to Retention Pond
		Survey Item – Surface water sampling and water flow rate measurement.
	***************************************	Coordinate- N-16° 40′ 25.10″, E- 96° 16′ 31.70″
7	GW-1	Location - In Moegyoe Swan Monastery
		Survey Item – Ground Water Sampling

Source: Myanmar Koei International Ltd.

### SW-1

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

### SW-2 (Reference Point)

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

### SW-3 (Reference Point)

SW-3 was collected at the upstream of Shwe Pyauk creek, after mixing point of Zone A and Zone B, which is flowing from east to west and then entering into the Yangon river. The distance is about 1.2 km downstream of SW-2. This sampling point is located at south of Zone A area and Dagon-Thilawa road. The surrounding area are Zone B in the south, 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 discharged water from local industrial zone, construction site of Zone B and Zone A, which is flowing from east to west and then entering into the Yangon river. The distance is about 820 m downstream of SW-3. This sampling point is located at southwest of Zone A area and at the south of Dagon-Thilawa road. The surrounding area are Zone B and local industrial zone in the east respectively.

### SW-5

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

### SW-6

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

### GW-1 (Reference of Existing Tube Well)

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



### 2.3 Monitoring Method

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

Table 2.3-1 Analytic Method for Water Quality

No.	Parameter	Method
1	Temperature	Instrument Analysis Method (Horiba, U-52, Multi Water Quality Checker)
2	pH	Instrument Analysis Method (Horiba, U-52, Multi Water Quality Checker)
3	Suspended Solids (SS)	APHA 2540 D (Dry at 103-105°C Method)
4 Dissolved Oxygen (DO) Instrument Analysis Method (Horiba, U-52, Multi Water Quality Checker)		Instrument Analysis Method (Horiba, U-52, Multi Water Quality Checker)
5	BOD (5)	APHA 5210 B (5 Days BOD Test)
6	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)
7	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)
8	Total Nitrogen (T-N)	HACH Method 10072(TNT Persulfate Digestion Method)
9	Total Phosphorous (T-P)	APHA 4500-P E (Ascorbic Acid Method)
10	Color	APHA 2120C (Spectrophotometric Method)
11	Odor	APHA 2150 B (Threshold Odor Test)
12	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)
13	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
14	Zinc	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
15	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
16	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
17	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
18	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
19	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
20	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
21	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
22	Nickel	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
23	Cyanide	HACH 8027 (Pyridine-Pyrazalone Method)
24	Free Chlorine	APHA 4500-Cl G (DPD Colorimetric Method)
25	Sulphide	HACH 8131 (USEPA Methylene Blue Method)
26	Formaldehyde	HACH 8110 (MBTH Method)
27	Phenols	USEPA Method 420.1 (Phenolics (Spectrophotometric, Manual 4-AAP With Distillation)
28	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
29	Total Dissolved Solids	APHA 2540C (Total Dissolved Solids Dried at 180°C Method)
30	Total Residual Chlorine	APHA 4500-Cl G (DPD Colorimetric Method)
31	Chromium (Hexavalent)	ISO 11083:1994 (Determination of chromium (VI) Spectrometric method using 1,5- diphenylcarbazide)
32	Ammonia	HACH Method 10205 (Silicylate TNT Plus Method)
33	Fluoride	APHA 4110 B (Ion Chromatography with Chemical Suppression of Eluent Conductivity)
34	Silver	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
35	Escherichia Coli	APHA 9221 F (Escherichia Coli Procedure Using Fluorogenic Substrate)
36	Flow Rate	Detection of Electromagnetic Elements (Real-time measurement by UC-200V Digital Current Meters)

### 2.4 Monitoring Period

Water quality and water flow rate monitoring were conducted on 26 December 2018 and sampling time is shown in Table 2.4-1 to avoid tidal effect. The tide record for Yangon river, Myanmar on 26 December 2018 is shown in Table 2.4-2.

**Table 2.4-1 Sampling Time of Each Station** 

vo.	Station	Sampling Time
1	SW-1	26/12/2018 14:42
2	SW-2	26/12/2018 09:49
3	SW-3	26/12/2018 08:51
4	SW-4	26/12/2018 10:43
5	SW-5	26/12/2018 15:07
6	SW-6	26/12/2018 14:20
7	GW-1	26/12/2018 15:42

Source: Myanmar Koei International Ltd.

Table 2.4-2 Tide Record for Yangon River, Myanmar

Date	Time	Height	Tide Conditions
	01:56	0.66	Low Tide
26/12/2010	06:31	5.78	High Tide
26/12/2018	14:46	0.38	Low Tide
	19:11	5.38	High Tide

Source: Myanmar Port Authority, Tide Table for the Yangon River and Elephant Point, 2018.

### 2.5 Monitoring Results

Results of water quality monitoring are summarized in Table 2.5-1. Analytical results of the laboratory are described in Appendix-2 and Appendix-3. The results were compared with the target value of effluent water quality discharging to water body stipulated in the EIA report.

## 2.5.1 Results of Water Quality at the Outlet of Sewage Treatment Plant of Industrial Area of Thilawa SEZ and at the Point Before Discharging to Creek

### (1) Results of Bi Annually Monitoring

WYWW \* O

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

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

As for the result of total coliform of surface water, the result at the outlet of the centralized STP (SW-6) exceeded the target value. A possible reason for exceeding the target value is that retained water did not reconstruct sufficiently with chlorine in the chlorine injection tank before discharging to outlet of the centralized STP at the time of sampling. Besides, this exceeding event is incidental case because the total coliform mentioning results in the previous monitoring months complied with the target value. Thus, the impact on

total coliform to the surrounding area is not expected. The results at the monitoring points retention pond (SW-1) and retention canal (SW-5) exceeded the target value due to the expected reasons: i) the potential expected reason might natural bacteria existed in all area of Zone A because there are various kinds of vegetation and creature such as birds, and small animals in and along the retention canal and retention pond and ii) the second suspect might be influence by water from the downstream of retention pond (SW-1).

Since the composition of the total coliform include bacteria from natural origin, and even after total coliform do not affect human health directly, self-monitoring for E. Coli analysis was carried out to identify health impact by coliform bacteria. As for the result of E. Coli of surface water, all of results were under the reference value. Therefore, although the target value of total coliform was exceeded at monitoring point of retention pond (SW-1), retention canal (SW-5) and the centralized STP (SW-6) but it is considered that there is no significant impact on human health.

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

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

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

As for the result of the iron, the result at the monitoring point of retention canal (SW-5) exceeded the target value may be due to the influence of natural origin (iron can reach out from the soil by run-off). However, since it cannot reach to the conclusion of what is the reason for this result, the continuous monitoring will be necessary.

### (2) Additional Monitoring

Regular water quality monitoring was carried out in accordance with EIA report. In addition to EIA report, additional self-water quality monitoring was also carried out on 4-Feb-2019. As of the water quality monitoring results on 26-Dec-2018, total coliform level exceeded at the outlet of the centralized STP (SW-6). Therefore, results (26-Dec-2018) is compared with results (4-Feb-2019). It can be clearly seen that the result of total coliform is lower in (4-Feb-2019) results. As for the result of total coliform on 26-Dec-2018, this exceeding issue is incidental case because the total coliform monitoring results in the previous monitoring month and additional monitoring result on 4-Feb-2019 complied with the target value. Thus, the impact on total coliform to the surrounding area is not expected.



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

Sampling Da			26.12.2018	4.2.2019	26.13	2.2018	4.2.2019	Target Value	
No.	Parameters	Unit	Regular Monitoring*1	Additional Monitoring <sup>11</sup>	Regular M	1onitoring*1	Additional Monitoring 1	(Reference Value for Self-	
			SW-1	SW-1	SW-5	SW-6	SW-6	Monitoring)	
1	Temperature	°C	28	-	29	27	-	≤ 35	
2	pH	•	7.4	*	8.9	6.6	7.5	6~9	
3	Suspended Solid (SS)	mg/L	8.00	*	120.00	4.00		50	
4	Dissolved Oxygen (DO)	mg/L	7.93	*	9.05	7.23	-	7/ <b>2</b> 9	
5	BOD (5)	mg/L	4.88	-	12.60	0.95		30	
6	COD (Cr)	mg/L	17.1	-	27	11		125	
7	Total Coliform	MPN/ 100ml	540	350	92,000	35,000	< 1.8	400	
8	Total Nitrogen (T-N)	mg/L	3.9	2 2	3	13.7	-	80	
9	Total Phosphorous (T-P)	mg/L	0.065	2	0.117	0.338	300	2	
10	Color	TCU (True Color Unit)	3.21	Ā	3.20	2.07	4	150	
11	Odor	TON (Threshold Odor Number)	2		1.4	1			
12	Oil and Grease	mg/L	< 3.1		< 3.1	< 3.1		10	
13	Mercury	mg/L	≤ 0.002		≤ 0.002	≤ 0.002		0.005	
14	Zinc	mg/L	≤ 0.002	*	≤ 0.002	0.148		2	
15	Arsenic	mg/L	≤ 0.01		≤ 0.01	≤ 0.01		0.1	
16	Chromium	mg/L	≤ 0.002		0.012	≤ 0.002	141	0.5	
17	Cadmium	mg/L	≤ 0.002	-	≤ 0.002	≤ 0.002	-	0.03	
18	Selenium	mg/L	≤ 0.01	-	≤ 0.01	≤ 0.01		0.02	
19	Lead	mg/L	≤ 0.002	-	≤ 0.002	0.006	*	0.1	
20	Copper	mg/L	≤ 0.002	-	≤ 0.002	≤ 0.002		0.5	
21	Barium	mg/L	0.03		0.042	0.012	(*)	1	
22	Nickel	mg/L	0.002	-	0.014	0.004		0.2	
23	Cyanide	mg/L	< 0.002	-	0.011	< 0.002	-	0.1	
24	Free Chlorine	mg/L	< 0.1		< 0.1	< 0.1		1	
25	Sulphide	mg/L	0.010	-	0.191	< 0.005	3.0	1	
26	Formaldehyde	mg/L	0.015	-	0.094	0.004		1 0.5	
27	Phenois	mg/L	< 0.1	•	0.18	< 0.1	190	0.5 3.5	
28	Total Dissolved Solids	mg/L mg/L	0.276 364		5.346 182.2	0.120 426		2000	
30	Total Residual Chlorine	mg/L	< 0.1	*	0.1	0.1	540	0.2	
31	Chromium (Hexavalent)	mg/L	< 0.05		< 0.05	< 0.05	*	0.1	
32	Ammonia	mg/L	0.023		0.637	0.007	7-	10	
33	Fluoride	mg/L	1.231	4	0.415	1.557	-	20	
34	Silver	mg/L	< 0.002		≤ 0.002	≤ 0.002		0.5	
35	Escherichia Coli	MPN/100ml (SW)	4.0	-	7.8	< 1.8	- 1	(1000)* (CFU/100m	
36	Flow Rate	m³/s	-			0.014			

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

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

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

Note: \*1 Regular water quality monitoring was carried out in accordance with EIA report. In addition to EIA report, additional self-water quality monitoring was also carried out on 4-Feb-2019. As of the water quality monitoring results on 26-Dec-2018, total coliform level exceeded at SW-6. Therefore, results (26-Dec-2018) is compared with Despite (4-Feb-2019). It can be clearly seen that the result of total coliform is lower in (4-Feb-2019) results.

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

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

As the comparison with the target value, the results of Suspended Solid (SS), total coliform, iron and total dissolved solids (TDS) were exceeded than the target value. As for the result of SS and TDS, results at the surface water monitoring points (SW-3 and SW-4) for SS and (SW-2, SW-3 and SW-4) for TDS exceeded the target value due to two expected reasons; i) delivered from upstream area such as natural origin and wastewater from local industrial zone which outside of Thilawa SEZ, and ii) influence by water from the downstream of monitoring points due to flow back by tidal fluctuation.

As for the result of total coliform of surface water, results at the surface water monitoring points (SW-2, SW-3 and SW-4) exceeded the target value due to two expected reasons; i) runoff of animal waste from the undeveloped area and delivered from local industrial zone and illegal dumping site from outside of Thilawa SEZ in the upstream area, and ii) delivered from surrounding area by tidal effect. The result of total coliform at the reference of existing tube well (GW-1) also exceeded the target value. It may be possible due to expected reasons i) the poor maintenance of well which can increase the risk of bacteria and other harmful organisms ii) the well was not operated regularly and didn't use for local people long time. In addition, the result of E. Coli of surface water and ground water, all of results were under the reference value. Therefore, although the target value of total coliform was exceeded at monitoring point of SW-2, SW-3, SW-4 and GW-1, but it is considered that there is no significant impact on human health.

As for the result of iron, the result at the monitoring point of surface water monitoring points (SW-3 and SW-4) exceeded the target value may be due to the influence of natural origin (iron can reach out from the soil by run-off). However, since it cannot reach to the conclusion of what is the reason for this result, the continuous monitoring will be necessary.



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

No.	Parameters	Unit	SW-2	SW-3	SW-4	GW-1	Target Value (Reference Value for Self- Monitoring)
1	Temperature	°C	24	24	25	32	≤35
2	рН		8.2	8.1	8.2	7.7	6~9
3	Suspended Solid (SS)	mg/L	46.00	196.00	154.00	2.00	50
4	Dissolved Oxygen (DO)	mg/L	8.44	8.35	7.77	6.51	() <b>*</b> /
5	BOD (5)	mg/L	4.63	3.55	2.58	1.57	30
6	COD (Cr)	mg/L	20	16	16	7.2	125
7	Total Coliform	MPN/100ml	160,000	35,000	35,000	920	400
8	Total Nitrogen (T-N)	mg/L	1.1	2.1	1.6	2.1	80
9	Total Phosphorous (T-P)	mg/L	< 0.050	< 0.050	< 0.050	0.09	2
10	Color	TCU (True Color Unit)	4.13	3.22	2.63	0.00	150
11	Odor	TON (Threshold Odor Number)	1.4	1	1.4	1.4	
12	Oil and Grease	mg/L	< 3.1	< 3.1	< 3.1	< 3.1	10
13	Mercury	mg/L	≤ 0.002	≤ 0.002	≤ 0.002	≤ 0.002	0.005
14	Zinc	mg/L	≤ 0.002	≤ 0.002	≤ 0.002	≤ 0.002	2
15	Arsenic	mg/L	≤ 0.01	≤ 0.01	≤ 0.01	≤ 0.01	0.1
16	Chromium	mg/L	≤ 0.002	0.014	0.008	≤ 0.002	0.5
17	Cadmium	mg/L	≤ 0.002	≤ 0.002	≤ 0.002	≤ 0.002	0.03
18	Selenium	mg/L	≤ 0.01	≤ 0.01	≤ 0.01	≤ 0.01	0.02
19	Lead	mg/L	≤ 0.002	≤ 0.002	≤ 0.002	≤ 0.002	0.1
20	Copper	mg/L	≤ 0.002	≤ 0.002	≤ 0.002	≤ 0.002	0.5
21	Barium	mg/L	0.074	0.06	0.058	0.08	1
22	Nickel	mg/L	0.006	0.022	0.014	≤ 0.002	0.2
23	Cyanide	mg/L	0.003	0.015	0.015	< 0.002	0.1
24	Free Chlorine	mg/L	< 0.1	< 0.1	< 0.1	< 0.1	1
25	Sulphide	mg/L	0.033	0.031	0.018	< 0.005	1
26	Formaldehyde	mg/L	0.028	0.014	0.022	0.015	1
27	Phenols	mg/L	0.4	< 0.1	0.17	< 0.1	0.5
28	Iron	mg/L	1.462	9.232	6.708	0.474	3.5
29	Total Dissolved Solids	mg/L	2,768	3,540	3,592	1,602	2000
30	Total Residual Chlorine	mg/L	0.1	0.1	0.1	< 0.1	0.2
31	Chromium (Hexavalent)	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	0,1
32	Ammonia	mg/L	0.360	0.055	0.035	2.150	10
33	Fluoride	mg/L	0.490	≤ 0.014	0.423	0.059	20
34	Silver	mg/L	≤ 0.002	≤ 0.002	≤ 0.002	≤ 0.002	0.5
35	Escherichia Coli	MPN/100ml* (SW)	6.8	26.0	32.0	-	(1000)* CFU/100ml (100)**
	EL D	MPN/100ml** (GW)	*	1-	- 0.250	11.0	(MPN/100ml)
36	Flow Rate	m³/s exceeded results than	3.00		0.350		-

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

Source Myanmar Koei International Ltd.

<sup>\*</sup>Note: Based on the water utilization at discharged creek, water quality C of quality standard for water baths in Japan, (Ministry of Environment, 1997) is set as a reference value of self-monitoring for surface water monitoring. However, due to limitation of capacity for analytical laboratory in Myanmar, the method to analyze the "Colony Forming Unit (CFU)" is not available in Myanmar. Therefore, the results of "Most Probable Number (MPN)" are assumed similar to CFU values and compared with reference values. Once the method to analyze the CFU will be available in Myanmar, the analytical method will be changed. According to the quality standard for water baths in Japan, (Ministry of Environment, 1997), in case of E.Coli result is exceeding 1,000 CFU/100 ml, since it is assumed unsafety, it is considered unsuitable for water baths.

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

### CHAPTER 3: CONCLUSION AND RECOMMENDATIONS

As for the result of SS, the results at the retention pond (SW-1) and the outlet of the centralized sewage treatment plant (SW-6) complied with the target value. On the other hand, parameters of SS at retention canal (SW-5) was exceeded.

The result of total coliform at the retention pond (SW-1), at the retention canal (SW-5), and the outlet of the centralized sewage treatment plant (SW-6) were exceeded the target values in this period of monitoring. The result of total coliform at (SW-6) exceeding the target values but the value this event was incidental case and its impact is not expected because the results in the previous monitoring months and results of additional monitoring at the outlet of the centralized STP (SW-6) and retention pond (SW-1) complied with the target value. Since the composition of the total coliform include bacteria from natural origin, and even after total coliform do not affect human health directly, self-monitoring for E. Coli analysis was carried out to identify health impact by coliform bacteria. In addition, according to the result of self-monitoring of E. Coli at retention pond (SW-1), at retention canal (SW-5), and the outlet of the centralized sewage treatment plant (SW-6), results were under the reference value. Therefore, although the target value of total coliform was exceeded at monitoring points SW-1, SW-5 and SW-6, but it is considered that there is no significant impact on human health.

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

As for parameters of SS, TDS, total coliform and iron in surface water were exceeded the target values at reference monitoring points. The expected reasons for exceeding the target values of SS at (SW-3 and SW-4) and TDS at (SW-2, SW-3 and SW-4) are delivered from upstream area such as natural origin and wastewater from local industrial zone which outside of Thilawa SEZ. The expected reasons for exceeding the target values of total coliform at (SW-2, SW-3 and SW-4) are by natural origin (natural bacteria existed). As for parameter of total coliform exceeded the target value at reference of existing tube well (GW-1), expected reasons are poor maintenance of well, not operated regularly, not used by local people. It will be recommended to test the tube well for total coliform every year. As mentioned in Section 2.5.2, the result of self-monitoring of E. Coli at SW-2, SW-3, SW-4 and GW-1 were under the reference value. Therefore, although the target value of total coliform was exceeded at reference monitoring point, but it is considered that there is no significant impact on human health. As for the parameter of iron exceeded the target value at reference monitoring points (SW-3 and SW-4), expected reasons are by natural origin (iron can reach out from the soil by run-off). As the comparison with the living environment standard value in Japan, iron results in SW-3 and SW-4 are lower than the standard value. Therefore, it can be considered that there is no significant impact on the living environment. However, it cannot reach to the conclusion of what is the reason to be exceeded the target values, thus the continuous monitoring and yearly trend analysis will be necessary based on the wet and dry season data.

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

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



# APPENDIX-1 FIELD SURVEY PHOTOS



### FOR DISCHARGING POINTS OF THILAWA SEZ ZONE A





Surface water sampling and onsite measurement at SW-1





Surface water sampling and onsite measurement at SW-5





Surface water sampling and onsite measurement at SW-6



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





Surface water sampling and onsite measurement at SW-2





Surface water sampling and onsite measurement at SW-3





Surface water sampling and onsite measurement at SW-4





Ground water sampling and onsite measurement at GW-1



# APPENDIX-2 LABORATORY RESULTS



### FOR DISCHARGING POINTS AND AFTER CENTRALIZED STP

DOWA

GOLDEN DOWA ECO-SYSTEM MYANMAR CD., LTD LOT NO E1: Thilawa SEZ Zone A, Yangon Region, Myanmar Phone No. Fax No. (+95) | 2309051



Report No. : GEM-LAB-201901121

Revision No. : 1

Report Date: 14 January, 2019 Application No.: 0049-C001

### Analysis Report

Client Name

Myanmar Koei International LTD (MXI)

Address

No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa Township, Yangon. Myarimar.

Project Name

MITTO

W-1812255

Sample Description

MKI-SW-1 1226 Sample Name

Sampling Date: 26 December, 2018

Sample No. Waste Profile No.

Sampling By : Customer Sample Received Date: 26 December, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	8.00	000
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/I	4.88	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/t	17.1	0.7
4	Total Coliform	APHA 92218 (Standard Total Coliform Fermentation Technique)	MPN/100ml	540	1.8
5	Oil and Grease	APHA 55208 (Partition-Gravimetric Method)	mg/t	< 3.1	3.1
6	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/t	3.9	0
7	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/I	0.065	0.050
8	Color	APHA 2120C (Spectrophotometric Method)	TCU	3.21	0.00
9	Odor	APHA 2150 B (Threshold Odor Test)	TON	2	0
10	TDS	APHA 2540 C (Total Dissolved Solids Dried at 180°C Method)	mg/i	364	
11	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Nethod)	mg/l	≤ 0.002	0.002
12	Zinc	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
13	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.01	0.01
14	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
15	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/I	≤ 0.002	0.002
16	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/i	≤ 0.01	0.01
17	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
18	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/i	s 0.002	0.002
19	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.03	0.001
20	Nickel	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/I	0.002	0.002
21	Silver	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
22	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/I	0.276	0.002
23	Cyanide	InACH 8027 (Pyridine -Pyrazatone Method	mg/l	< 0.002	0.002
24	Ammonia	HACH Method 10205 (Silicylate TNT Plus Method)	mg/l	0.023	0.020
25	Hexavelent Chromium (Cr6+)	ISO 11083-1994 (Determination of thromium(VI) Spectrometric method using 1,5-aphenykarbazide)	mg/L	< 0.05	0.05
26	Fluoride	APHA 4110 B (Ion Chromatography with Chemical Suppression of Eluent Conductivity)	mg/t	1.231	0.014
27	Total Chlorine	APHA 4500 CL G (DPD Colonmetric Method)	mg/I	< 0.1	0.1
28	Free Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	< 0.1	0.1
29	Sulphide	HACH 8131 (USEPA Methylene Blue Method)	mg/t	0.010	0.005
30	Formaldehyde	HACH 8110 (MBTH Method)	mg/l	0.015	0.003
31	Phenois	USEPA Method 420.1 (Phenolics (Spectrophotometric, Manual 4AAP With Distillation))	mg/I	< 0.1	0.1

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

Supervisor

Approved By

THILAWAD

### ADDITIONAL MONITORING AT SW-1



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



motivate our planet Doc No: GEM-LB-R004E/00 Page1of1

Report No.: GEM-LAB-201902073

Revision No.: 1

Report Date: 11 February, 2019

Application No.: 0049-C001

### Analysis Report

Client Name : Myanmar Koei International LTD (MKI)

Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.

Project Name : MJTD

Sample Description

Sample Name : MKI-SW-1-0204 Sampling Date : 4 February, 2019

Sample No. : W-1902013 Sampling By : Customer

Waste Profile No. : - Sample Received Date : 4 February, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	Total Coliform	APHA 92218 (Standard Total Coliform Fermentation Technique)	MPN/100ml	350	1.8
	######################################	70.00	-		
-	-				

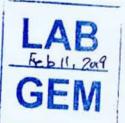
Remark : LOQ - Limit of Quantitation

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

22nd edition

Analysed By :

Ni Ni Aye Lwin Supervisor Approved By :



Tomoya Suzuki

Director Febili 200





GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD. Lot No F1. Thilawa 517 Zone A, Yangon Region, Myanmar Phone No Fae No. (+95) 1 2109051



Report No. : GEM-LAB-201901122

Revision No. : 1

Report Date: 14 January, 2019 Application No.: 0049-C001

### Analysis Report

Client Name

Myanmar Koei International LTD (MKI) No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa Township, Yangon, Myanmar,

Project Name

Sample Description

Address

MKI 5W 5-1226 Sample Name

Sampling Date : 26 December, 2018

W-1812256 Sample No. Sampling By . Customer

Waste Profile No. Sample Received Date: 26 December, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/I	120.00	
2	BOD (5)	APHA 5210 8 (5 Days BOD Test)	mg/l	12.60	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	27	0.7
4	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100mi	92000	1.8
5	Oil and Grease	APHA 55208 (Partition Gravimetric Method)	mg/l	< 3.1	3.1
6	Total Nitrogen	HACH Method 10072 (TN1 Persulfate Digestion Method)	mg/I	3	0
7	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/I	0.117	0.050
8	Color	APHA 2120C (Spectrophotometric Method)	TCU	3.20	0.00
9	Odor	APHA 2150 B (Threshold Odor Test)	TON	1.4	0
10	TDS	APHA 2540 C (Total Dissolved Solids Dried at 180°C Method)	mg/l	182.2	
11	Mercury	APHA 3120 fi (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
12	Zinc	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/I	\$ 0.002	0.002
13	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/f	S 0.01	0.01
14	Chremium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/t	0.012	0.002
15	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/I	5.0.002	0.002
16	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.01	0.01
17	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
18	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	< 0.002	0.002
19	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.042	0.001
20	Nickel	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.014	0.002
21	Silver	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/I	≤ 0.002	0.002
22	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	5.346	0.002
23	Cyanide	HACH 8027 (Pyridine -Pyrazalone Method	mg/t	0.011	0.002
24	Ammonia	HACH Method 10205 (Silicylate TNT Plus Method)	mg/l	0.637	0.020
25	Hexavalent Chromium (Cr6+)	150 L1083 1994 (Determination of chromium(VI) Spectrometric method using 1,5-8phenyicartizacke)	mg/I	< 0.05	0.05
26	Fluoride	APHA 4110 B (Ion Chromatography with Chemical Suppression of Fluent Conductivity)	mg/l	0.415	0.014
27	Total Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	0.1	0.1
28	Free Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/I	< 0.1	0.1
29	Sulphide	HACH 8131 (USEPA Methylene Blue Method)	mg/l	0.191	0.005
30	Formaldehyde	HACH 8110 (MBTH Method)	mg/l	0.094	0.003
31	Phenois	USEPA Method 420.1 (Phenolics (Spectrophotometric, Manual 4AAP With Distillation))	rng/l	0.18	0.1

: 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

Supervisor

Director Jan 14, 7019





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



Report No. : GEM-LAB-201901123

Revision No.: 1

Report Date: 14 January, 2019

Application No.: 0049 C001

Analysis Report

Client Name

: Myanmar Koei International LTD (MKI)

Address

No 1A /28, Mya Thidar Housing, Ward 11, South Okkalapa Township, Yangon. Myanmar.

Project Name

DILM

Sample Description

Sample Name

MK1-5W-6-1226

Sampling Date: 26 December, 2018

W-1812257 Sample No.

Sampling By : Customer

Waste Profile No.

Sample Received Date: 26 December, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105°C Method)	mg/l	4.00	-
2	800 (5)	APHA 5210 B (5 Days BOD Test)	mg/I	0.95	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	11	0.7
4	Total Coliform	APHA 92218 (Standard Total Coliform Fermentation Technique)	MPN/100ml	35000	1.8
5	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
6	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	13.7	0
7	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.338	0.050
8	Color	APHA 2120C (Spectrophotometric Method)	TCU	2.07	0.00
9	Oder	APHA 2150 B (Threshold Odor Test)	TON	1	0
10	TDS	APHA 2540 C (Total Dissolved Solids Dried at 180'C Method)	mg/t	426	
11	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/i	≤ 0.002	0.002
12	Zinc	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.148	0.00
13	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/i	≤ 0.01	0.01
14	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
15	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/t	≤ 0.002	0.002
16	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.01	0.01
17	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/i	0.006	0.002
18	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/i	≤ 0.002	0.002
19	Barium	APHA 3120 8 (Inductively Coupled Plasma (ICP) Method)	mg/l	0.012	0.00
20	Nickel	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.004	0.003
21	Silver	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/!	≤ 0.002	0.002
22	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/i	0.120	0.00
23	Cyanide	HACH 8027 (Pyridine -Pyrazaione Method	mg/l	< 0.002	0.00
24	Ammonia	HACH Method 10205 (Silicylate TNT Plus Method)	mg/i	0.007	0.021
25	Hexavalent Chromium (Cr6+)	ISO 11093:1994 (Determination of chronium(VI) Spectrometric method using 1,5-diphenyicarbande)	mg/!	< 0.05	0.05
26	Fluoride	APHA 4110 B (Ion Chromatography with Chemical Suppression of Eluent Conductivity)	mg/!	1.557	0.01
27	Total Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/I	0.1	0.1
28	Free Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	< 0.1	0.1
29	Sulphide	HACH 8131 (USEPA Methylene Blue Method)	mg/t	< 0.005	0.00
30	Formaldehyde	HACH 8110 (MBTH Method)	mg/l	0.004	0.00
31	Phenois	USEPA Method 420.1 (Phenolics (Spectrophotometric, Manual 4AAP With Distillation))	mg/l	< 0.1	0.1

Remark

LOQ - Limit of Quantitation

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

Analysed By

Supervisor

Approved By 1



### ADDITIONAL MONITORING AT SW-6



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



motivate our planet Doc No: GEM-LB-R004E/00 Page1of1

Report No.: GEM-LAB-201902074

Revision No.: 1

Report Date: 11 February, 2019

Application No.: 0049-C001

### Analysis Report

Client Name : Myanmar Koei International LTD (MKI)

Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.

Project Name : MJTD

Sample Description

Sample Name : MKI-SW-6-0204 Sampling Date : 4 February, 2019

Sample No. : W-1902014 Sampling By : Customer

Waste Profile No. : - Sample Received Date : 4 February, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	Total Coliform	APHA 92218 (Standard Total Coliform Fermentation Technique)	MPN/100ml	< 1.8	1.8
		70-2			
		(1)			
			-		

Remark : LOQ - Limit of Quantitation

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

Analysed By :

Ni Ni Aye Lwin

Supervisor

Approved By:

给了百世

Tomoya Suzuki

Director Feb 11, 2019



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

DOWA

GOLDEN DOWN 5CO SYSTEM MYNNMAR CD., LYD. Lot No. E1. Thilaws SEZ Zone A. Yangon Region, Mysmmar Phone No. Fax No. (+95) 1.2309051



Report No.: GEM-LAB-201901124

Revision No. : 1

Report Date: 14 January, 2019

Application No. : 0049-C001

### Analysis Report

Client Name

Myanmar Koel International LTD (MKI)

Address

No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa Township, Yangon. Myanmar.

Project Name

Sample Description

Sample Name Sample No.

MKI-5W-2-1226

W-1812258

Sampling Date: 26 December, 2018

Sampling By : Customer

Waste Profile No.

Sample Received Date : 26 December, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	46.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	4.63	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	20	0.7
4	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	160000	1.8
5	Oil and Grease	APHA 55208 (Partition-Gravimetric Method)	mg/I	< 3.1	3.1
6	Total Nitrogen	HACH Method 10072 (TNT Persuifate Digestion Method)	mg/l	1.1	0
7	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	< 0.050	0.050
8	Color	APHA 2120C (Spectrophotometric Method)	TCU	4.13	0.00
9	Odor	APHA 2150 B (Threshold Odor Test)	TON	1.4	0
10	TDS	APHA 2540 C (Total Dissolved Solids Dried at 180'C Method)	mg/I	2768	100
11	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/i	≤ 0.002	0.003
12	Zinc	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.003
13	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.01	0.01
14	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.00
15	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.00
1000	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	2515	\$ 0.01	0.00
16	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/i	s 0.002	0.00
-	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/t	5 0.002	
18	And the second s	I was a second to the second t	mg/l	0.074	0.00
19	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l		0.00
20	Nickel	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.006	0.00
21	Silver	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.00
22	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/i	1.462	0.00
23	Cyanide	HACH 8027 (Pyridine -Pyrazalone Method	mg/l	0.003	0.00
24	Ammonia	HACH Method 10205 (Silicylate TNT Plus Method)	mg/I	0.360	0.02
25	Hexavalent Chromium (Cr6+)	ISO 11083-1994 (Determination of chromium(VI) Spectrometric method using 1,5-duhery/carbabde)	mg/l	< 0.05	0.05
26	Fluoride	APHA 4110 B (Ion Chromatography with Chemical Suppression of Eluent Conductivity)	mg/l	0.490	0.01
27	Fotal Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	0.1	0.1
28	Free Chlorine	APHA 4500 CL G (DPD Colonmetric Method)	mg/I	< 0.1	0.1
29	Suiphide	HACH 8131 (USEPA Methylene Blue Method)	mg/l	0.033	0.00
30	Formaldehyde	HACH 8110 (MBTH Method)	mg/l	0.028	0.00
31	Phenois	USEPA Method 420.1 (Phenolics (Spectrophotometric, Manual 4AAP With Distillation))	mg/l	0.4	0.1

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

Supervisor

Approved By



DOWA

GOLDEN DOWN ECO-SYSTEM MYANMAR CD , LTD Lot No E3. Thilaws SEZ Zone A, Vangon Region, Myanmar Phone No. 144 No. (+93) 1.2809051



Report No. : GEM-LAB-201901125

Revision No. : 1

Report Date : 14 January, 2019 Application No.: 0049-C001

### Analysis Report

Myanmar Koei International LTD (MKI) Client Name

Address No.1A /28, Mya Thidar Housing, Ward 11, South Okkelepa Township, Yangon, Myanmar.

Project Name MIID

Sample Description

MKI-SW-3-1226 Samping Date | 26 December, 2018 Sample Name

Sample No. W-1812259 Sampling By : Customer

Waste Profile No. Sample Received Date: 26 December, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 25400 (Dry at 103-105°C Method)	mg/l	196.00	
2	800 (5)	APHA 5210 B (5 Days BOD Test)	rng/l	3.55	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	16	0.7
4	Total Coliform	APHA 92218 (Standard Total Coliform Fermentation Technique)	MPN/100ml	35000	1.8
5	Oil arid Grease	APHA 55208 (Partition-Gravimetric Method)	mg/i	< 3.1	3.1
6	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/t	2.1	0
7	Total Phosphorous	APHA 4500 P E (Ascorbic Acid Method)	mg/l	< 0.050	0.050
8	Color	APHA 2120C (Spectrophotometric Method)	TCU	3.22	0.00
9	Odor	APHA 2150 B (Threshold Odor Test)	TON	1	0
10	TOS	APHA 2540 C (Total Dissolved Solids Dried at 180°C Method)	mg/I	3540	-
					-
11	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/I	≤ 0.002	0.003
12	Zinc	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/!	≤ 0.002	0.00
13	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/I	\$ 0.01	0.01
14	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/I	0.014	0.00
15	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Nethod)	mg/I	≤ 0.002	0.00
16	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.01	0.01
17	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	< 0.002	0.00
18	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/I	≤ 0.002	0.00
19	Barrom	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.06	0.00
20	Nickel	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/I	0.022	0.00
21	Silver	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/I	≤ 0.002	0.00
22	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/!	9.232	0.00
23	Cyanide	HACH 8027 (Pyridine -Pyrazalone Method	mg/i	0.015	0.00
24	Ammonia	HACH Method 10205 (Silicylate TNT Plus Method)	mg/r	0.055	0.02
25	Hexavalent Chromium (Cr6+)	ISO ; 1083 1994 (Determination of chromuni(VI) Spectrometric mustod using 1,5 dipheretrarbands)	mg/I	< 0.05	0.05
26	Fluoride	APHA 4110 B (Ion Chromatography with Chemical Suppression of Eluent Conductivity)	mg/t	≤ 0.014	0.01
27	Total Chlonne	APHA 4500 CL G (DPD Colonmetric Method)	mg/l	0.1	0.1
28	Free Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/i	< 0.1	0.1
29	Sulph/de	HACH 8131 (USEPA Methylene Blue Method)	mg/!	0.031	0.00
30	Formaldehyde	HACH 8110 (MBTH Method)	mg/f	0.014	0.00
31	Phenois	USEPA Method 420.1 (Phenolics (Spectrophotometric, Manual 4AAP With Distillation))	mg/i	< 0.1	0.1

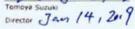
LOQ - Limit of Quantitation

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

Analysed By

NI NI Aye Lwin Supervisor

Approved By







GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD Lot No EL. Thilawa SEZ Zone A., Yangon Region, Myanin Phone No. Fax No. (+95) 1, 2909051



Report No. ; GEM-LAB-201901126

Revision No. : 1

Report Date: 14 January, 2019

Application No.: 0049-C001

### Analysis Report

Client Name

: Myanmar Koel International LTD (MKI)

Adcress

: No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa Township, Yangon. Myanmar.

Project Name

: MITD

Sample Description

Sample Name Sample No.

Waste Profile No.

MKI-SW-4-1226 W-1812260

Sampling Date: 26 December, 2018

Sampling By : Customer

Sample Received Date : 26 December, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	154.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/I	2.58	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	16	0.7
4	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	35000	1.8
5	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
6	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	1.6	0
7	Total Phosphorous	APHA 4500 P E (Ascorbic Acid Method)	mg/I	< 0.050	0.050
8	Color	APHA 2120C (Spectrophotometric Method)	TCU	2.63	0.00
9	Odor	APHA 2150 B (Threshold Odor Test)	TON	1.4	0
10	TOS	APHA 2540 C (Total Dissolved Solids Dried at 180'C Method)	mg/l	3592	
11	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/i	s 0.002	0.002
12	Zinc	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	s 0.002	0.002
13	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/I	≤ 0.01	0.01
14	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.008	0.002
15	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/I	≤ 0.002	0.002
16	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/I	s 0.01	0.01
17	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
18	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
19	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.058	0.001
20	Nickel	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.014	0.002
21	Silver	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	\$ 0.002	0.002
22	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	6.708	0.002
23	Cyanide	HACH 8027 (Pyridine -Pyrazalone Method	mg/l	0.015	0.002
24	Ammonia	HACH Method 10205 (Silicylate TNT Plus Method)	mg/l	0.035	0.020
25	Hexavalent Chromium (Cr6+)	ISO 11083 1994 (Determination of divornium(VI) Spectrometric method using 1,5-diphenylcarbaside)	mg/I	< 0.05	0.05
26	Fluoride	APHA 4110 B (Ion Chromatography with Chemical Suppression of Eluent Conductivity)	mg/l	0.423	0.014
27	Total Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	0.1	0.1
28	Free Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	< 0.1	0.1
29	Sulphide	HACH 8131 (USEPA Methylene Blue Method)	mg/l	0.018	0.005
30	Formaldenyde	HACH 8110 (MBTH Method)	mg/l	0.022	0.003
31	Phenois	USEPA Method 420 1 (Phenolics (Spectrophotometric, Manual 4AAP With Distillation))	mg/l	0.17	0.1

Remark

LOQ - Limit of Quantitation

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

Analysed By

Supervisor





GOLDEN DOWA ECO-SYSTEM MYANWAR CO., ETD Lot No ET. Thilewa SEZ Sone A. Yangon Region, Myanmar Phone No. Fax No. 1+95/ 1. 2409051



Report No. : GEM-LAB-201901129

Revision No. 1 1

Report Date: 14 January, 2019 Application No. : 0049-C001

### Analysis Report

Client Name

Myanmar Koei International LTD (MKI)

Address

No.: A /28, Mya Thidar Housing, Ward 11, South Okkalapa Township, Yangon, Myanmar.

Project Name

MJTO

Sample Description

Sample Name MK1-GW-1-1226 Sample No. W-1812263

Sampling Date: 26 December, 2018

Sampling By : Customer

Waste Profile No.

Sample Received Date : 26 December, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	2.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/I	1.57	0.00
3	COD (Cr)	APHA 52200 (Close Reflux Colonmetric Method)	mg/l	7.2	0.7
4	Total Celiform	APHA 92218 (Standard Total Coliform Fermentation Technique)	MPN/100ml	920	1.8
5	Oil and Grease	APHA 55208 (Partition-Gravimetric Method)	mg/i	< 3.1	3.1
6	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	7.1	0
7	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/i	0.09	0.05
8	Color	APHA 2120C (Spectrophotometric Method)	TCU	0.00	0.00
9	Odor	APHA 2150 B (Threshold Odor Test)	TON	1.4	0
10	TDS	APHA 2540 C (Total Dissolved Solids Oried at 180'C Method)	rng/l	1602	1
11	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.00
12	Zinc	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.00
13	Arsenic.	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≠ 0.01	0.0
14	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.00
15	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.00
16	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	s 0.01	0.0
17	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.00
18	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/f	≤ 0.002	0.00
19	Bartum	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.05	0.00
20	Nickel	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/i	≤ 0.002	0.00
21	Silver	APHA 3120 8 (Inductively Coupled Plasma (ICP) Method)	mg/t	\$ 0.002	0.00
22	Iron	APHA 3128 8 (Inductively Coupled Plasma (ICP) Method)	mg/I	0.474	0.00
23	Cyanide	HACH 8027 (Pyridine -Pyrazalone Method	mg/l	< 0.002	0.00
24	Ammonia	HACH Method 10205 (Silicylate TNT Plus Method)	mg/l	2 150	0.02
25	Hexavalent Chromium (Cr6+)	ISC 12083-1994 (Cete-miracion of chremium(VI) Specimetric method using 1,5-inphenyica-baside)	mg/i	< 0.05	0.0
26	Fluoride	APHA 4110 B (ton Ehromatography with Chemical Suppression of Eluent Conductivity).	mg/l	0.059	0.01
27	Total Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/t	< 0.1	0.1
28	Free Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	< 0.1	0.1
29	Sulphide	HACH 8131 (USEPA Methylene Blue Method)	mg/f	< 0.005	0.00
30	Formaldehyde	HACH 8110 (M8TH Method)	mg/I	3.015	0.00
31	Phenois	USEPA Method 420 1 (Phenolics (Spectrophotometric, Marius) 4AAP With Distillation))	mg/I	< 0.1	0.1

Remark

: LOQ - Limit of Quantitation

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

Analysed By

N. N. Aye Lwin



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



### FOR DISCHARGING POINTS AND AFTER CENTRALIZED STP



GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD. Lot No E1. Thilawa SEZ Zone A, Yangon Region, Myanmar, Phone No Fax No: (495) 1 2309051



Report No.: GEM-LAB-201901111

Revision No. ; 1

Report Date: 15 January, 2019 Application No.: 0049-C001

### Analysis Report

Client Name

; Myanmar Koei International LTD (MKI)

Address

No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.

Project Name

MJTD

Sample Description

Sample Name

MKI-SW-1-1226

Sampling Date: 26 December, 2018

Sample No.

W-1812245

Sampling By: Customer

Waste Profile No.

Sample Received Date: 26 December, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	4.0	1.8

LOQ - Limit of Quantitation

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

Analysed By:

Ni Ni Aye Lwin

Supervisor

Approved By:

Tomoya Suzuki

Director

14 th.
Jan 15-, 7019





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



Report No.: GEM-LAB-201901112

Revision No.: 1

Report Date: 15 January, 2019

Application No.: 0049-C001

### Analysis Report

Client Name : Myanmar Koei International LTD (MKI)

Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.

Project Name : MJTD

Sample Description

Sample Name MKI-SW-5-1226 Sampling Date: 26 December, 2018

: W-1812246 Sample No. Sampling By : Customer

Waste Profile No. Sample Received Date : 26 December, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	7.8	1.8
	TANK B				
	c =10=				-

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 :

Approved By:

Ni Ni Aye Lwin

Supervisor

Tomoya Suzuki Director Jan 15, Zo19





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-201901113

Revision No.: 1

Report Date: 15 January, 2019

Application No.: 0049-C001

### Analysis Report

Client Name

Myanmar Koei International LTD (MKI)

Address

No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.

Project Name

MJTD

Sample Description

Sample Name

MKI-SW-6-1226

Sampling Date: 26 December, 2018

Sample No.

Waste Profile No.

W-1812247

Sampling By : Customer

Sample Received Date: 26 December, 2018

hia 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

Analysed By:

Ni Ni Aye Lwin

Supervisor

Approved By:

Tomoya Suzuki

Director Jan 15, 2019



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



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-201901114

Revision No.: 1

Report Date: 15 January, 2019

Application No.: 0049-C001

Analysis Report

: Myanmar Koei International LTD (MKI) Client Name

Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.

Project Name MITD

Sample Description

: MKI-SW-2-1226 Sampling Date: 26 December, 2018 Sample Name

Sample No. W-1812248 Sampling By: Customer

Waste Profile No. Sample Received Date: 26 December, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	6.8	1.8
	SM = M N N				-151
		-			

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:

Approved By:

Ni Ni Aye Lwin

Supervisor

Director Jan 15, 2019





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-201901115

Revision No.: 1

Report Date: 15 January, 2019 Application No.; 0049-C001

### Analysis Report

Client Name

Myanmar Koei International LTD (MKI)

Address

No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.

Project Name

MJTD

Sample Description

Sample Name

MKI-SW-3-1226

Sampling Date: 26 December, 2018

Sample No.

Waste Profile No.

W-1812249

Sampling By: Customer

Sample Received Date : 26 December, 2018

No.	Parameter	Method	Unit	Result	rod
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	26.0	1.8

Remark

LOQ - Limit of Quantitation

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

Analysed By :

Ni Ni Aye Lwin

Supervisor

Approved By:

Tomoya Suzuki

Director Jan 15, 7-19





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-201901116

Revision No.: 1

Report Date: 15 January, 2019

Application No.: 0049-C001

### Analysis Report

Client Name ; Myanmar Koei International LTD (MKI)

Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.

Project Name : MJTD

Sample Description

Sample Name : MKI-SW-4-1226 Sampling Date : 26 December, 2018

Sample No. : W-1812250 Sampling By : Customer

Waste Profile No. : - Sample Received Date : 26 December, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	32.0	1.8
					-

Remark : LOQ - Limit of Quantitation

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

Analysed By:

Jan /5, 20 9 Approved By:

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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-201901119

Revision No.: 1

Report Date: 15 January, 2019 Application No.: 0049-C001

### Analysis Report

Client Name

: Myanmar Koei International LTD (MKI)

Address

: No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.

Project Name

Sample Description

Sample Name MKI-GW-1-1226 Sampling Date: 26 December, 2018

Sample No.

Waste Profile No.

W-1812253

Sampling By : Customer

Sample Received Date : 26 December, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	11.0	1.8
-					
	owens E need	AND I SEE SEE			
		THE PERSON NAMED IN			

Remark

LOQ - Limit of Quantitation

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

Analysed By :

Ni Ni Aye Lwin

Supervisor

If I 2n Approved By :





Thilawa Special Economic Zone (Zone A) **Development Project (Operation Phase)** 

### **Appendix**

**Water and Waste Water Monitoring Report** February, 2019



# WATER QUALITY MONITORING REPORT FOR DEVELOPMENT OF INDUSTRIAL AREA IN THILAWA SEZ ZONE A (OPERATION STAGE)

(Bi-Monthly Monitoring)

February 2019 Myanmar Koei International Ltd.



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### **CHAPTER 1: INTRODUCTION**

### 1.1 General

Thilawa Special Economic Zone (SEZ) is located in southern district of Yangon region and about 23 km southeast of Yangon city. As the developer of Thilawa SEZ, Myanmar Japan Thilawa Development Ltd. (MJTD) has a responsibility to carry out regular monitoring in the industrial area of Zone A in accordance with the approved Environmental Impact Assessment (EIA) report and Environmental Management Plan (EMP). MJTD has implemented monitoring various environmental items with the specified time frame to know the environmental conditions in and around the area. As for the monitoring of the water quality, total seven sampling points are set for water quality survey, named SW-1, SW-2, SW-3, SW-4, SW-5, SW-6, and GW-1 have been monitored in Thilawa SEZ and its surrounding area in timely manner. Among the seven locations, SW-1 and SW-5 are main discharged points of Thilawa SEZ and SW-6 is discharged from centralized Sewage Treatment Plant (STP) which is required to monitor by Environmental Monitoring Plan (EMoP) in EIA report of Thilawa SEZ Zone A. The remaining points SW-2, SW-3 and SW-4 are sampled as a reference monitoring for comparison with discharged points and baseline of discharged creek. Moreover, GW-1 is monitored as a reference of existing tube well which located in the monastery compound. Location of sampling points for water quality monitoring is shown in Figure 1.1-1.



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



### **CHAPTER 2: WATER QUALITY MONITORING**

### 2.1 Monitoring Items

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

Water quality sampling was carried out at seven locations. Among the seven locations, water flow measurement carried out at four locations (SW-1, SW-4, SW-5 and SW-6) where can be measured by Current Meter. Monitoring items and sampling points are summarized in Table 2.1-1.

Table 2.1-1 Monitoring Items for Water Quality

No.	Parameters	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	GW-I	Remarks
1	pH	0	0	0	0	0	0	0	On-site measurement
2	Water Temperature	0	0	0	0	0	0	0	On-site measurement
3	DO	0	0	0	0	0	0	0	On-site measurement
4	BOD (5)	0	0	0	0	0	0	0	Laboratory analysis
5	COD (Cr)	0	0.	0	0	.0	0	0	Laboratory analysis
6	Total Nitrogen	0	0	0	0	0	0	. 0	Laboratory analysis
7	Suspended Solids	0	0	0	.0	0	0	0	Laboratory analysis
8	Total Coliform	0	0	0	0	0	0	0	Laboratory analysis
9	Total Phosphorous	0	0	0	0	0	0	0	Laboratory analysis
10	Color	0	0	0	0	0	0	0	Laboratory analysis
11	Odor	0	0	0	0	0	0	0	Laboratory analysis
12	Escherichia Coli (Self-monitoring)	0	0	o	0	0	0	0	Laboratory analysis
13	Flow Rate	0	-	-	0	0	0	-	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
		Coordinate - N - 16° 40' 13.5", E - 96° 16' 39.8"
1	SW-1	Location - Outlet of Retention Pond
		Survey Item – Surface water sampling and water flow rate measurement.
		Coordinate - N - 16° 40' 20.69", E - 96° 17' 18.04"
2	SW-2	Location - Upstream of Shwe Pyauk Creek
		Survey Item – Surface water sampling.
		Coordinate- N - 16° 40' 5.50", E - 96° 16' 41.60"
3	SW-3	Location - Upstream of Shwe Pyauk Creek, after mixing point of Thilawa SEZ Zone A and Zone B.
		Survey Item – Surface water sampling.
	SW-4	Coordinate- N - 16° 39' 42.84", E - 96° 16' 27.42"
4		Location - Downstream of Shwe Pyauk Creek
		Survey Item – Surface water sampling and water flow rate measurement.
	2.00	Coordinate- N - 16° 40' 10.7", E - 96° 16' 22.6"
5	SW-5	Location - Outlet of Retention Canal
		Survey Item – Surface water sampling and water flow rate measurement.
		Coordinate- N - 16° 40' 27.13", E - 96° 16' 30.68"
6	SW-6	Location - Outlet from STP to Retention Pond
		Survey Item – Surface water sampling and water flow rate measurement.
		Coordinate- N - 16° 40' 25.10", E - 96° 16' 31.70"
7	GW-1	Location - In Moegyoe Swan Monastery
		Survey Item - Ground Water Sampling

Source: Myanmar Koei International Ltd.



### SW-1

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

### SW-2 (Reference Point)

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

### SW-3 (Reference Point)

SW-3 was collected at the upstream of Shwe Pyauk creek after mixing point of Zone A and Zone B, which is flowing from east to west and then entering into the Yangon River. The distance is about 1.2 km downstream of SW-2. This sampling point is located in the south of Zone A area and Dagon-Thilawa Road. The surrounding areas are Zone B in the south and local industrial zone in the east respectively.

### SW-4 (Reference Point)

SW-4 was collected at the downstream of Shwe Pyauk creek, after mixing of discharge water from local industrial zone, construction site of Zone B and Zone A, which is flowing from east to west and then entering into the Yangon River. The distance is about 820 m downstream of SW-3. This sampling point is located in the southwest of Zone A area and in the south of Dagon-Thilawa road. The surrounding areas are Zone B and local industrial zone in the east respectively.

### SW-5

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

### SW-6

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

### **GW-1** (Reference of Existing Tube Well)

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



### 2.3 Monitoring Method

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

Table 2.3-1 Analytic Method for Water Quality

No.	Parameter	Method
1	Water Temperature	Instrument Analysis Method (Horiba, U-52, Multi Water Quality Checker)
2	pH	Instrument Analysis Method (Horiba, U-52, Multi Water Quality Checker)
3	Dissolved Oxygen (DO)	Instrument Analysis Method (Horiba, U-52, Multi Water Quality Checker)
4	BOD (5)	APHA 5210 B (5 Days BOD Test)
5	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)
6	Total Nitrogen (T-N)	HACH Method 10072(TNT Persulfate Digestion Method)
7	Suspended Solids (SS)	APHA 2540D (Dry at 103-105°C Method)
8	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)
9	Total Phosphorous (T-P)	APHA 4500-P E (Ascorbic Acid Method)
10	Color	APHA 2120C (Spectrophotometric Method)
11	Odor	APHA 2150 B (Threshold Odor Test)
12	Escherichia Coli	APHA 9221 F (Escherichia Coli Procedure Using Fluorogenic Substrate)
13	Flow Rate	Detection of Electromagnetic Elements (Real-time measurement by UC-200V Digital Current Meters)

Source: Myanmar Koei International Ltd

### 2.4 Monitoring Period

Water quality and water flow rate monitoring conducted on 13 February 2019 and sampling time is shown in Table 2.4-1 to avoid tidal effect. The tide record for Yangon River, Myanmar on 13 February 2019 is shown in Table 2.4-2.

Table 2.4-1 Sampling Time of Each Station

No.	Station	Sampling Time
1	SW-1	13/02/2019 10:56
2	SW-2	13/02/2019 14:31
3	SW-3	13/02/2019 09:26
4	SW-4	13/02/2019 13:24
5	SW-5	13/02/2019 11:22
6	SW-6	13/02/2019 10:27
7	GW-1	13/02/2019 16:01

Source: Myanmar Koei International Ltd.

Table 2.4-2 Tide Record for Yangon River, Myanmar

Date	Time	Height	Tide Conditions
	04:27	0.76	Low Tide
12/02/2010	09:34	4.29	High Tide
13/02/2019	16:31	0.96	Low Tide
	22:04	4.64	High Tide

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



### 2.5 Monitoring Results

Results of water quality monitoring are summarized in Table 2.5-1. Analytical results of the laboratory are described in Appendix-2 and Appendix-3. The results were compared with the target value of effluent water quality discharging to water body stipulated in the EIA report.

### 2.5.1 Results of Water Quality at the Outlet of Sewage Treatment Plant of Industrial Area of Thilawa SEZ and at the Point before Discharging to Creek

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

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

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

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

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

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

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



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

No.	Parameters	Unit	SW-1	SW-5	SW-6	Target Value (Reference Value for Self- Monitoring)
1	Temperature	.c	33	32	30	≤35
2	рН	*	7.5	8.2	7.0	6~9
3	Suspended Solid (SS)	mg/L	640.00	98.00	2.00	50
4	Dissolved Oxygen (DO)	mg/L	6.58	6.63	7.14	
5	BOD (5)	mg/L	3.88	4.08	1.71	30
6	COD (Cr)	mg/L	20	52	19.6	125
7	Total Coliform	MPN/ 100ml	1,600	350	< 1.8	400
8	Total Nitrogen (T-N)	mg/L	13.1	1.6	13.1	80
9	Total Phosphorous (T-P)	mg/L	0.26	< 0.050	0.985	2
10	Color	TCU (True Color Unit)	4.61	3,92	1.86	150
11	Odor	TON (Threshold Odor Number)	1.4	2	2	
12	Escherichia Coli	MPN/100ml	4.0	9.2	< 1.8	(1,000)* (CFU/100ml)
13	Flow Rate	m³/s	0.032	0.011	0.036	-

Note: Red color means exceeded value than target value.

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

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

Source: Myanmar Koei International Ltd.

ADEVA

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

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

As the comparison with the target value, the results of Suspended Solid (SS) and total coliform exceeded than the target value. As for the result of SS, results at the surface water monitoring points (SW-3 and SW-4) exceeded the target value due to two expected reasons; i) delivered from upstream area such as natural origin and wastewater from local industrial zone which outside of Thilawa SEZ, and ii) influence by water from the downstream of monitoring points due to flow back by tidal fluctuation.

As for the result of total coliform of surface water, results at surface water monitoring points (SW-2, SW-3 and SW-4) exceeded the target value due to two expected reasons; i) runoff of animal waste from the undeveloped area and delivered from local industrial zone and illegal dumping site from outside of Thilawa SEZ in the upstream area, and ii) delivered from surrounding area by tidal effect. In addition, the result of E.Coli of surface water, all of results were under the reference value. Therefore, although the target value

of total coliform exceeded at monitoring point of SW-2, SW-3 and SW-4, but it is considered that there is no significant impact on human health.

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

No.	Parameters	Unit Unit	SW-2	SW-3	SW-4	GW-1	Target Value (Reference Value for Self- Monitoring)
1	Temperature	.C	28	27	30	35	≤35
2	рН		7.8	7.2	7.8	7.9	6~9
3	Suspended solid (SS)	mg/L	28.00	254.00	164.00	4.00	50
4	Dissolved oxygen (DO)	mg/L	3.97	5.63	5.43	5.71	*
5	BOD (5)	mg/L	15.41	3.79	2.89	1.56	30
6	COD (Cr)	mg/L	119	27.5	21.1	33.5	125
7	Total coliform	MPN/ 100ml	> 160,000	24,000	92,000	70	400
8	Total nitrogen (T-N)	mg/L	1.9	9.1	4.1	2.5	80
9	Total phosphorous (T-P)	mg/L	0.289	0.155	0.103	0.063	2
10	Color	TCU (True Color Unit)	21.86	3.49	2.63	0.37	150
11	Odor	TON (Threshold Odor Number)	2	2	2	1.4	
12	Fooksalakia Cali	MPN/100 ml* (SW)	4.0	< 1.8	14.0	(*)	(1,000)* (CFU/100ml)
12	Escherichia Coli	MPN/100 ml** (GW)	17	1 <del>4</del> 77		2.0	(100)** (MPN/100ml)
13	Flow Rate	m³/s			0.128	*	

Note: Red colors means exceeded value than target value.

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

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

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



### CHAPTER 3: CONCLUSION AND RECOMMENDATIONS

As for the result of SS and total coliform the results at the outlet of the centralized STP (SW-6) complied with the target value of both of them. It may prove that effluent from each locator was treated well by the STP. On the other hand, parameters of SS at retention pond (SW-1) and at retention canal (SW-5) exceeded the target values, and parameters of total coliform at retention pond (SW-1) exceeded the target values in this period for main discharged points of Thilawa SEZ Zone A. In addition, according to the result of self-monitoring of E. coli at retention pond (SW-1), result was under the reference value. Therefore, although the target value of total coliform was exceeded at monitoring point SW-1, but it is considered that there is no significant impact on human health.

As for parameters of SS and total coliform in surface water exceeded the target values at reference monitoring points. The expected reasons for exceeding the target values of SS are delivered from upstream area such as natural origin and wastewater from local industrial zone which outside of Thilawa SEZ. The expected reasons for exceeding the target values of total coliform are by natural origin (natural bacteria existed). As mentioned in Section 2.5.2, the result of self-monitoring of E. coli at SW-2, SW-3 and SW-4 were under the reference value. Therefore, although the target value of total coliform exceeded at reference monitoring point, but it is considered that there is no significant impact on human health. However, it cannot reach to the conclusion of what the reason to be exceeded the target values is, thus the continuous monitoring and yearly trend analysis will be necessary to carry out based on the rainy and dry season data.

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

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

End of the Document



# APPENDIX-1 FIELD SURVEY PHOTOS



### FOR DISCHARGED POINTS OF THILAWA SEZ ZONE A



Surface water sampling and onsite measurement at SW-1



Surface water sampling and onsite measurement at SW-5



Surface water sampling and onsite measurement at SW-6

### 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-3





Surface water sampling and onsite measurement at SW-4





Ground water sampling and onsite measurement at GW-1



## APPENDIX-2 LABORATORY RESULTS



### FOR DISCHARGED POINTS AND AFTER CENTRALIZED STP



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-201902203

Revision No.: 1

Report Date: 27 February, 2019 Application No.: 0049-C001

### Analysis Report

Client Name : Myanmar Koei International LTD (MKI)

: No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa Township, Yangon. Myanmar.

: MJTD Project Name

Sample Description

Sample Name : MKI-SW-1-0213 Sampling Date: 13 February, 2019

: W-1902121 Sample No. Sampling By : Customer

Waste Profile No. Sample Received Date: 13 February, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	ss	APHA 2540D (Dry at 103-105'C Method)	mg/l	640.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	3.88	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	20	0.7
4	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	1600	1.8
5	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	13.1	0
6	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/i	0.26	0.050
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	4.61	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	1.4	0
-			100		

LOQ - Limit of Quantitation

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

Analysed By :

Ni Ni Aye Lwin

Supervisor

Approved By :

Tomoya Suzuki

Director Feb 27. 2.19





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-201902207

Revision No.: 1

Report Date: 27 February, 2019 Application No.: 0049-C001

### Analysis Report

Client Name : Myanmar Koei International LTD (MKI)

Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa Township, Yangon. Myanmar.

Project Name : MJTD

Sample Description

Sample Name : MKI-SW-5-0213 Sampling Date : 13 February, 2019

Sample No. : W-1902125 Sampling By : Customer

Waste Profile No. : - Sample Received Date : 13 February, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105°C Method)	mg/l	98.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	4.08	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	52	0.7
4	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100mi	350	1.8
5	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	1.6	0
6	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	< 0.050	0.050
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	3.92	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	2	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 :

Ni Ni Aye Lwin

Supervisor

Approved By :

Tomova Suzuki

Director Feb 27. 2019





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-201902208

Revision No.: 1

Report Date: 27 February, 2019

Application No.: 0049-C001

### Analysis Report

Client Name : Myanmar Koel International LTD (MKI)

: No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa Township, Yangon. Myanmar. Address

Project Name

Sample Description

Sample Name : MKI-SW-6-0213 Sampling Date: 13 February, 2019

Sample No. : W-1902126 Sampling By : Customer

Waste Profile No. Sample Received Date: 13 February, 2019

3 CO	5 DD (5) DD (Cr)	APHA 2540D (Dry at 103-105'C Method)  APHA 5210 B (5 Days BOD Test)	mg/l mg/l	2.00	0.00
3 CO	750 (450)		mg/i	1.71	0.00
	OD (Cr)				5.50
4 Tot		APHA 5220D (Close Reflux Colorimetric Method)	mg/l	19.6	0.7
	otal Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	< 1.8	1.8
5 Tot	otal Nitrogen	HACH Method 10072 (TNT Persuifate Digestion Method)	mg/i	13.1	0
6 Tot	otal Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.985	0.050
7 Co	olor	APHA 2120C (Spectrophotometric Method)	TCU	1.86	0.00
8 Od	dor	APHA 2150 B (Threshold Odor Test)	TON	2	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:

Ni Ni Aye Lwin

Supervisor

Approved By:

Tomoya Suzuki

Director 786 27. 2019



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



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-201902204

Revision No.: 1

Report Date: 27 February, 2019

Application No.: 0049-C001

### Analysis Report

Client Name

: Myanmar Koei International LTD (MKI)

Address

No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa Township, Yangon. Myanmar.

Project Name

: MJTD

Sample Description

: MKI-SW-2-0213

Sampling Date: 13 February, 2019

Sample Name Sample No.

: W-1902122

Sampling By : Customer

Waste Profile No.

Sample Received Date: 13 February, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	28.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	15.41	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/I	119	0.7
4	Total Coliform	APHA 92218 (Standard Total Coliform Fermentation Technique)	MPN/100ml	> 160000	1.8
5	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	1.9	0
6	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.289	0.050
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	21.86	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	2	0
9	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
10	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002

Remark

LOQ - Limit of Quantitation

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

Analysed By :

Ni Ni Aye Lwin

Supervisor

Approved By:

Director Feb 27, 2019





GOLDEN DOWA FCO-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-201902205

Revision No. : 1

Report Date: 27 February, 2019 Application No.: 0049-C001

### Analysis Report

Client Name

: Myanmar Koei International LTD (MKI)

Address

: No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa Township, Yangon. Myanmar.

Project Name

Sample Description

Sample Name

: MKI-SW-3-0213

Sampling Date: 13 February, 2019

Sample No.

Waste Profile No.

: W-1902123

Sampling By : Customer

Sample Received Date: 13 February, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	254.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	3.79	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/I	27.5	0.7
4	Total Coliform	APHA 92218 (Standard Total Coliform Fermentation Technique)	MPN/100ml	24000	1.8
5	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/i	9.1	0
6	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.155	0.050
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	3.49	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	2	0
9	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/t	3.200	3.1
10	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.012	0.002

LOQ - Limit of Quantitation

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

Analysed By :

Ni Ni Aye Lwin Supervisor

Approved By:

Tomoya Suzuki

Feb 27. 2019 Director





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



Report No.: GEM-LAB-201902206

Revision No. : 1

Report Date: 27 February, 2019

Application No.: 0049-C001

Analysis Report

: Myanmar Koei International LTD (MKI) Client Name

Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa Township, Yangon. Myanmar.

Project Name

Sample Description

Sample Name : MKI-SW-4-0213 Sampling Date: 13 February, 2019

: W-1902124 Sample No.

Sampling By : Customer

Waste Profile No. Sample Received Date: 13 February, 2019

No.	Parameter	Method	Unit	Result	LOQ	
1	ss	APHA 2540D (Dry at 103-105'C Method)	mg/l	164.00		
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	2.89	0.00	
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	21.1	0.7	
4	Total Coliform	APHA 92218 (Standard Total Coliform Fermentation Technique)	MPN/100ml	92000	1.8	
5	Total Nitrogen	HACH Method 10072 (TNT Persuifate Digestion Method)	mg/I	4.1	0	
6	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.103	0.050	
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	2.63	0.00	
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	2	0	
9	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/I	< 3.1	3.1	
10	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/I	0.014	0.002	

: LOQ - Limit of Quantitation

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

Analysed By :

Ni Ni Aye Lwin

Supervisor

Approved By:

Director Feb 27, 7019





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-201902211

Revision No. : 1

Report Date: 27 February, 2019 Application No.: 0049-C001

### Analysis Report

Client Name

: Myanmar Koei International LTD (MKI)

Address

; No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa Township, Yangon. Myanmar.

Project Name

: MJTD

Sample Description

Sample Name

: MKI-GW-1-0213

Sampling Date: 13 February, 2019

Sample No.

: W-1902129

Sampling By : Customer

Waste Profile No.

Sample Received Date: 13 February, 2019

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	4.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	1.56	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/I	33.5	0.7
4	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	70	1.8
5	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/I	2.5	0
6	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.063	0.050
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	0.37	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	1.4	0

Remark

: LOQ - Limit of Quantitation

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

Analysed By:

Ni Ni Aye Lwin

Supervisor

Approved By:

Tomoya Suzuki Director Feh 27, 2-9



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



### FOR DISCHARGED POINTS AND AFTER CENTRALIZED STP



GOLDEN DOWN ECD-SYSTEM MYANMAR CO., LTD Let No E1. Thilawa SEZ Zone A, Yangon Region, Myanmar. Phone No. Fax No: [+95] 1 2309051



Report No.: GEM-LAB-201902111

Revision No. : 1

Report Date: 19 February, 2019 Application No.: 0049-C001

### Analysis Report

: Myanmar Koei International LTD (MKI) Client Name

Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.

Project Name

Sample Description

: MKI-SW-1-0213 Sample Name

Sampling Date: 13 February, 2019

Sample No. : W-1902111 Sampling By : Customer

Waste Profile No. Sample Received Date: 13 February, 2019

No.	Parameter	Method	Unit	Result	rod	
1 Escherichia Coli	APHA 9221 F Escherichia Celi Procedure Using Fluorogenic Substrate	MPN/100ml	4.0	1.8		
	- 1987				-	

LOQ - Limit of Quantitation

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

Analysed By :

Ni Ni Ave Lwin

Supervisor

Approved By :

Director Feb 19, 2009





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-201902115

Revision No.: 1

Report Date: 19 February, 2019 Application No.: 0049-C001

### Analysis Report

Client Name : Myanmar Koei International LTD (MKI)

Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.

: MJTD Project Name

Sample Description Sample Name

Waste Profile No.

: MKI-SW-5-0213

Sampling Date: 13 February, 2019 Sampling By : Customer

Sample No. : W-1902115

Sample Received Date: 13 February, 2019

Parameter	Method	Unit	Result	LOQ
Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	9.2	1.8
			1314	
	10/20/10/10/10/10	110000000000000000000000000000000000000		Scherichia Coli APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate MPN/100ml 9.2

: LOQ - Limit of Quantitation

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

Analysed By :

Ni Ni Aye Lwin

Supervisor

Approved By :





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-201902116

Revision No. : 1

Report Date: 19 February, 2019 Application No.: 0049-C001

### Analysis Report

: Myanmar Koei International LTD (MKI)

Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.

: MJTD **Project Name** 

Sample Description

Sample Name MKI-SW-6-0213 Sampling Date: 13 February, 2019

: W-1902116 Sampling By : Customer

Waste Profile No. Sample Received Date: 13 February, 2019

Parameter	Method	Unit	Result	LOQ	
1 Escherichie Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	< 1.8	1.6	
	and the state of t	150000			
	Parameter Escherichia Coli		Escherichia Coli APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate MPN/100ml	Escherichia Coli APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate MPN/100ml < 1.8	

LOQ - Limit of Quantitation

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

Analysed By :

Ni Ni Aye Lwin

Supervisor



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

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-201902112

Revision No.: 1

Report Date: 19 February, 2019 Application No.: 0049-C001

### Analysis Report

Client Name : Myanmar Koei International LTD (MKI)

Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.

Project Name : MJTD

Sample Description

Sample Name : MKI-SW-2-0213

Sampling Date: 13 February, 2019

Sample No. : W-1902112

Sampling By : Customer

Waste Profile No. :

Sample Received Date: 13 February, 2019

	LOQ
ml 4.0	1.8
***	
	-

Remark

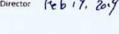
LOQ : Limit of Quantitation

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

Analysed By :

Ni Ni Aye Lwin Supervisor LAB Feb 19, 2019 GEM Approved By :

Tomoya Suzuki







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



Report No.: GEM-LAB-201902113

Revision No.: 1

Report Date: 19 February, 2019 Application No.: 0049-C001

### Analysis Report

Client Name : Myanmar Koei International LTD (MKI)

Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.

Project Name : MJTD

Sample Description

Sample Name : MKI-SW-3-0213

Sampling Date : 13 February, 2019

Sample No. : W-1902113

Sampling By : Customer

Waste Profile No. :

Sample Received Date: 13 February, 2019

No.	Parameter	Method	Unit	Result	LOQ	
1	Escherichia Coli	APIIA 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

Analysed By :

Ni Ni Aye Lwin

Supervisor

Approved By :

Tomova Suzuki

Director Tab 19 2-19





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-201902114

Revision No.: 1

Report Date: 19 February, 2019 Application No.: 0049-C001

### Analysis Report

Client Name : Myanmar Koei International LTD (MKI)

Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa

Project Name : MJTI

Sample Description

Sample Name : MKI-SW-4-0213

: MKI-SW-4-0213 Sampling Date : 13 February, 2019 : W-1902114 Sampling By : Customer

Sample No. : W-1902114 Sampling By : Customer

Waste Profile No. : - Sample Received Date : 13 February, 2019

No. Parameter Method Unit Result LOQ

1 Escherichia Coli APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate MPN/100ml 14.0 1.8

Remark LOQ - Limit of Quantitation

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

Analysed By:

Ni Ni Aye Lwin

Supervisor

D

Teb 19. 2019

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Approved By :

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GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD. Lot No F1. Thilawa SEZ Zone A, Yangon Region, Myanmar Phone No Fax No: (+95) 1 2309051



Report No. : GEM-LAB-201902119

Revision No. : 1

Report Date: 19 February, 2019 Application No.: 0049-C001

### Analysis Report

: Myanmar Koei International LTD (MKI)

No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa Address

Project Name MJTD

Sample Description

Sample Name : MKI-GW-1-0213 Sampling Date: 13 February, 2019

Sample No. W-1902119 Sampling By : Customer

Waste Profile No. Sample Received Date: 13 February, 2019

No.	Parameter	Parameter Method Unit							
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Pluorogenic Substrate	MPN/100ml	MPN/100ml 2.0					
			-						
		TO SEE STORY OF THE SECOND SEC							

Remark

LOQ - Limit of Quantitation

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

Analysed By :

Ni Ni Aye Lwin

Supervisor

Approved By :

Tomoya Suzuki Director Feb 9. 2019





### Thilawa Special Economic Zone (Zone A) Development Project (Operation Phase)

### **Appendix**

Air Quality Monitoring Report February, 2019



### AIR QUALITY MONITORING REPORT FOR DEVELOPMENT OF INDUSTRIAL AREA THILAWA SEZ ZONE A (OPERATION STAGE)

(BI-ANNUALLY MONITORING)

February 2019 Myanmar Koei International Ltd.



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### 2.4 Monitoring Method

Monitoring of CO, NO<sub>2</sub>, TSP, PM<sub>10</sub> and SO<sub>2</sub> 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 five minutes and directly reads and records onsite for CO, NO<sub>2</sub>, TSP, PM<sub>10</sub> and SO<sub>2</sub>. Due to the limitation of the analytical equipment in Myanmar, TSP results were calculated as predicted value which is based on the results of PM<sub>10</sub>. Therefore, the result of TSP was evaluated using the estimated TSP concentration values. The state of air quality monitoring is shown in Figure 2.4-1.



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<sub>2</sub>, TSP, PM<sub>10</sub> and SO<sub>2</sub> are described in Table 2.5-1. Comparing with the target value of CO, NO<sub>2</sub>, TSP, PM<sub>10</sub> and SO<sub>2</sub> prescribed in EIA report for Thilawa SEZ development project Zone A, concentration of CO was lower than the target value, while concentration of NO<sub>2</sub> measured results for three days, TSP measured values for five days, PM<sub>10</sub> measured values for five days and SO<sub>2</sub> measured values for seven days exceeded the target value.

Regarding the calculation of predicted TSP concentration, the correlation value between PM<sub>10</sub> and TSP of ambient air quality guideline value in Thailand as below;

330  $\mu g/m^3$  (TSP standard value in Thailand) / 120  $\mu g/m^3$  (PM<sub>10</sub> standard value in Thailand) = 2.75 (Correlation value)



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

Date	СО	NO <sub>2</sub>	TSP	PM10	SO <sub>2</sub>
Date	ppm	ppm	mg/m <sup>3</sup>	mg/m <sup>3</sup>	ppm
06 ~ 07 February, 2019	0.206 (0.235 mg/m <sup>3</sup> )	0.056 (0.106 mg/m <sup>3</sup> )	0.220	0.080	0.042 (0.109 mg/m <sup>3</sup> )
07 ~ 08 February, 2019	0.258 (0.296 mg/m <sup>3</sup> )	0.084 (0.158 mg/m <sup>3</sup> )	0.349	0.127	0.057 (0.148 mg/m <sup>3</sup> )
08 ~ 09 February, 2019	0.270 (0.309 mg/m <sup>3</sup> )	0.060 (0.113 mg/m <sup>3</sup> )	0.335	0.122	0.062 (0.164 mg/m <sup>3</sup> )
09 ~ 10 February, 2019	0.159 (0.182 mg/m <sup>3</sup> )	0.038 (0.072 mg/m <sup>3</sup> )	0.182	0.066	0.040 (0.105 mg/m <sup>3</sup> )
10 ~ 11 February, 2019	0.212 (0.243 mg/m <sup>3</sup> )	0.063 (0.119 mg/m <sup>3</sup> )	0.463	0.168	0.070 (0.182 mg/m <sup>3</sup> )
11 ~ 12 February, 2019	0.270 (0.309 mg/m <sup>3</sup> )	0.072 (0.135 mg/m <sup>3</sup> )	0.442	0.161	0.105 (0.275 mg/m <sup>3</sup> )
$12 \sim 13$ February, 2019	0.267 (0.306 mg/m <sup>3</sup> )	0.056 (0.105 mg/m <sup>3</sup> )	0.334	0.122	0.095 (0.249 mg/m <sup>3</sup>
7 Days Average Value	0.235 (0.269 mg/m³)	0.061 (0.115 mg/m <sup>3</sup> )	0.332	0.121	0.067 (0.176 mg/m <sup>3</sup>
Target Value	10 (11.45 mg/m <sup>3</sup> )	<0.06 (0.11 mg/m <sup>3</sup> )	<0.33	<0.12	<0.04 (0.11 mg/m <sup>3</sup> )

Note: The target value of CO,  $NO_2$  and  $SO_2$  were converted to ppm units from  $mg/m^3$ . Red color mentions the exceeded value for  $NO_2$ , TSP,  $PM_{10}$  and  $SO_2$ .

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



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



### NO<sub>2</sub>

Overall summary of total exceeded hours from Day 1 to Day 7 for NO<sub>2</sub> are shown in Table 2.5-2. Based on the summary table of wind direction appearance ratio of total exceeded hours for NO<sub>2</sub>, the total exceeded hours for seven days were 84 hours. After detailed analysis of the NO<sub>2</sub> exceeded time according to the wind direction, most exceeded hours are come from West-Southwest (WSW) and some exceeded hours are come from Southeast (SE), Southwest (SW) and West (W). Possible emission sources are affected from the operation and construction activities of Zone A's locators, daily human activities in Moegyoe Swan Monastery Compound, running vehicles on Dagon-Thilawa road and transportation in and around the monitoring area.

Table 2.5-2 Summary of Wind Direction Appearance Ratio at AQ-1 (NO2 Exceeded hours)

Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	s	ssw	sw	wsw	w	WNW	NW	NNW	Total
Total (Times)	2	1	4	4	3	0	8	7	6	5	9	20	10	3	1	1	84
Appearance Ratio	2%	1%	5%	5%	4%	0%	10%	8%	7%	6%	11%	24%	12%	4%	1%	1%	100%
Avg Value of Exceeded hours	0.154	0.147	0.102	0.132	0.133	0.000	0.114	0.110	0.107	0.104	0.096	0.109	0.110	0.103	0.142	0.150	1.02
Avg Value (Daily)	0.154	0.147	0.102	0.107	0.098	0.002	0.066	0.044	0.056	0.058	0.073	0.080	0.046	0.042	0.020	0.150	-

Red color mentions the most exceeded appearance ratio for NO2

The result of wind direction for NO<sub>2</sub> is shown in Figure 2.5-2. The air quality monitoring from 6 February 2019 to 13 February 2019 suggested that the prevailing wind direction is from West-Southwest (WSW) to West (W).



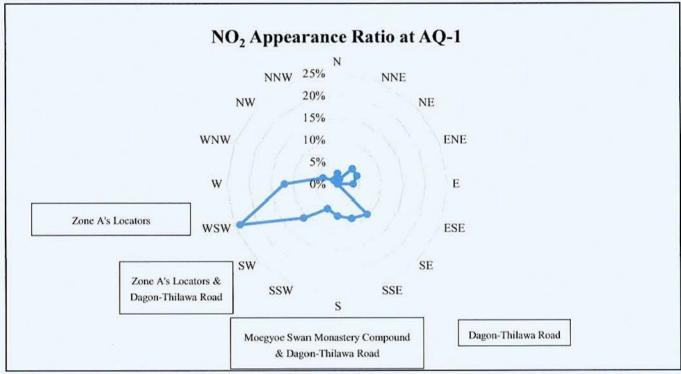


Figure 2.5-2 Wind Direction for NO2 at AQ-1

### TSP

Overall summary of total exceeded hours from Day 1 to Day 7 for TSP are shown in Table 2.5-3. Based on the summary table of wind direction appearance ratio of total exceeded hours for TSP, the total exceeded hours for seven days were 64 hours. After detailed analysis of the TSP exceeded time according to the wind direction, most exceeded hours are come from unpaved vacant area, daily human activities in Southeast (SE) and South-Southeast (SSE) and some exceeded hours are come from Southwest (SW) and West-Southwest (WSW). Possible emission sources are affected from daily human activities in Moegyoe Swan Monastery Compound, running vehicles on Dagon-Thilawa road, construction activities of Zone A's locators, natural origin such as dust from unpaved vacant area and transportation in and around the monitoring area.

Table 2.5-3 Summary of Wind Direction Appearance Ratio at AO-1 (TSP Exceeded hours)

SOUS CONTRACTOR OF THE PARTY OF	14	DIC 2.5	-3 Sui	umary	01 441	na Di	ection	Appe	aranc	e Kau	o at A	Q-1 (1)	OI EX	eeded	nours,	0.00	I CANDONIA
Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	s	ssw	sw	wsw	w	WNW	NW	NNW	Total
Total (Times)	2	1	4	4	4	0	11	11	4	4	5	5	4	2	2	1	64
Appearance Ratio	3%	2%	6%	6%	6%	0%	17%	17%	6%	6%	8%	8%	6%	3%	3%	2%	100%
Avg Value of Exceeded hours	0.830	0.401	0.496	0.733	0.464	0.000	0.646	0.671	0.509	0.594	0.440	0.395	0.506	0.923	0.396	0.606	2
Avg Value (Daily)	0.830	0.401	0.496	0.632	0.430	0.078	0.538	0.454	0.292	0.318	0.296	0.237	0.195	0.311	0.199	0.606	-

Red color mentions the most exceeded appearance ratio for TSP

The result of wind direction for TSP is shown in Figure 2.5-3. The air quality monitoring from 6 February 2019 to 13 February 2019 suggested that the prevailing wind direction is from Southeast (SE) to South-Southeast (SSE).

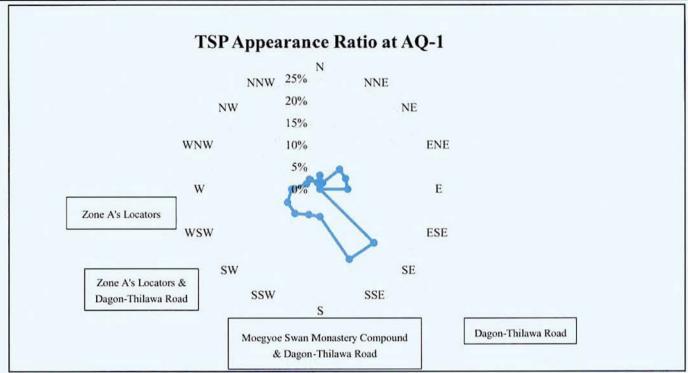


Figure 2.5-3 Wind Direction for TSP at AQ-1

### $PM_{10}$

Overall summary of total exceeded hours from Day 1 to Day 7 for PM<sub>10</sub> are shown in Table 2.5-4. Based on the summary table of wind direction appearance ratio of total exceeded hours for PM<sub>10</sub>, the total exceeded hours for seven days were 64 hours. After detailed analysis of the PM<sub>10</sub> exceeded time according to the wind direction, most exceeded hours are come from Southeast (SE) and South-Southeast (SSE) and some exceeded hours are come from Southwest (SW) and West-Southwest (WSW). Possible emission sources are affected from daily human activities in Moegyoe Swan Monastery Compound, running vehicles on Dagon-Thilawa road, construction activities of Zone A's locators, natural origin such as dust from unpaved vacant area and transportation in and around the monitoring area.

Vivi Head of the Laborator	Tac	ne 2.5-	4 Sun	imary	or wi	na Dir	ection	Appe	arance	Ratio	at A	2-1 (PN	110 EX	ceeded	Hours	9	Common of
Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	S	ssw	sw	wsw	w	WNW	NW	NNW	Total
Total (Times)	2	1	4	4	4	0	11	11	4	4	5	5	4	2	2	1	64
Appearance Ratio	3%	2%	6%	6%	6%	0%	17%	17%	6%	6%	8%	8%	6%	3%	3%	2%	100%
Avg Value of Exceeded hours	0.302	0.146	0.184	0.266	0.169	0.000	0.235	0.244	0.185	0.216	0.160	0.144	0.184	0.336	0.144	0.220	(4)
Avg Value (Daily)	0.302	0.146	0.180	0.230	0.156	0.028	0.196	0.165	0.106	0.115	0.108	0.086	0.071	0.113	0.072	0.220	

Red color mentions the most exceeded appearance ratio for PM<sub>10</sub>

The result of wind direction for PM<sub>10</sub> is shown in Figure 2.5-4. The air quality monitoring from 6 February 2019 to 13 February 2019 suggested that the prevailing wind direction is from Southeast (SE) to South-Southeast (SSE).



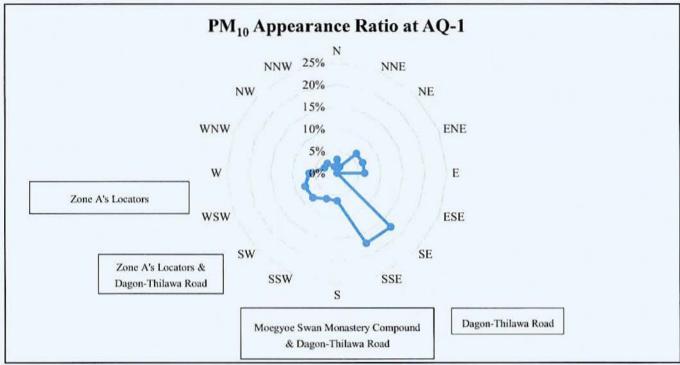


Figure 2.5-4 Wind Direction for PM<sub>10</sub> at AQ-1

### SO<sub>2</sub>

Overall summary of total exceeded hours for Day 1 to Day 7 for SO<sub>2</sub> are shown in Table 2.5-5. Based on the summary table of wind direction appearance ratio of total exceeded hours for SO2, the total exceeded hours for seven days were 109 hours. After detailed analysis of the SO<sub>2</sub> exceeded time according to the wind direction, most exceeded hours are come from West-Southwest (WSW) and some exceeded hours are come from Southeast (SE), South-Southeast (SSE), Southwest (SW) and West (W). Possible emission sources are affected from the operation and construction activities of Zone A's locators, natural origin such as dust from unpaved vacant area, combustion of fuel for vehicles on Dagon-Thilawa road and transportation in and around the monitoring area.

	1 a	bie 2.5	-5 Sun	nmary	oi w	na Di	rection	Appe	aranc	е кап	o at A	2-1 (20	J <sub>2</sub> Exc	eeded	Hours	THE PERSON NAMED IN	POLICE IN
Direction	N	NNE	NE	ENE	E	ESE	SE	SSE	s	ssw	sw	wsw	w	WNW	NW	NNW	Total
Total (Times)	2	1	3	4	4	1	12	16	7	8	12	23	11	2	2	1	109
Appearance Ratio	2%	1%	3%	4%	4%	1%	11%	15%	6%	7%	11%	21%	10%	2%	2%	1%	100%
Avg Value of Exceeded hours	0.103	0.053	0.058	0.070	0.083	0.043	0.171	0.122	0.094	0.109	0.100	0.072	0.113	0.061	0.066	0.069	-
Avg Value (Daily)	0.103	0.053	0.053	0.061	0.068	0.014	0.139	0.090	0.055	0.079	0.092	0.059	0.047	0.018	0.015	0.069	-

Red color mentions the most exceeded appearance ratio for SO<sub>2</sub>

The result of wind direction for SO<sub>2</sub> is shown in Figure 2.5-5. The air quality monitoring from 6 February 2019 to 13 February 2019 suggested that the prevailing wind direction is from West-Southwest (WSW) to West (W).



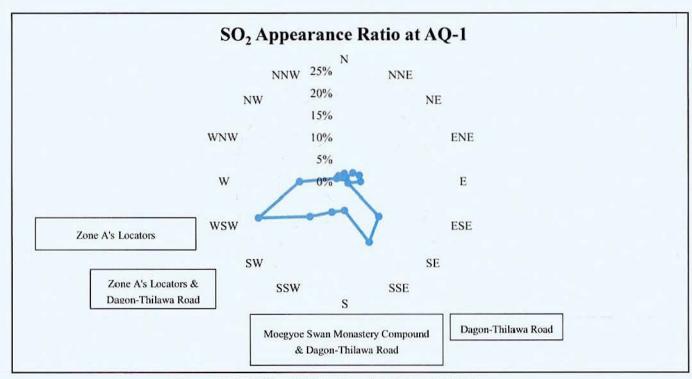


Figure 2.5-5 Wind Direction for SO<sub>2</sub> at AQ-1



### **CHAPTER 3: CONCLUSION AND ISSUES TO BE SOLVED**

The result of air quality at AQ-1, concentration of CO during seven days monitoring was not exceeded the target value, thus there are no impacts on the surrounding environments. On the other hand, results of NO<sub>2</sub> level measured for three days, results of TSP and PM<sub>10</sub> level measured for five days and SO<sub>2</sub> level measured for seven days in this monitoring period are higher than the target value.

During the seven days monitoring period, 84 hours results were exceeded for NO<sub>2</sub>, 64 hours were exceeded for TSP, 64 hours were exceeded for PM<sub>10</sub> and 109 hours were exceeded for SO<sub>2</sub>.

After detailed analysis of the NO<sub>2</sub> exceeded time according to the wind direction, most exceeded hours are come from West-Southwest (WSW), West (W), Southwest (SW) and southeast (SE). Possible emission sources are affected from running vehicles on Dagon-Thilawa road and transportation in and around the monitoring area and the operation and construction activities from Zone A's locators.

After detailed analysis of the TSP and PM<sub>10</sub> exceeded time according to the wind direction, most exceeded hours are come from South-Southeast (SSE) and Southeast (SE). Possible emission sources are affected from the running vehicles on Dagon-Thilawa Road, natural origin such as dust from unpaved vacant area, and transportation in and around the monitoring area.

After detailed analysis of the SO<sub>2</sub> exceeded time according to the wind direction, most exceeded hours are come from West-Southwest (WSW), South-Southeast (SSE). Possible emission sources are affected from combustion of fuel for vehicles from Dagon-Thilawa Road and the operation and construction activities of Zone A's locators.

As for future subject for air quality monitoring in Zone A, the following action may be taken to achieve the target level:

- 1) To spray the water during construction period for Zone A's locators
- 2) To control the speed limit of all machinery and vehicle (25km/hr) on site to avoid excessive dust creation and to minimize air pollution by the exhaust fumes
- 3) To conduct the proper operation (stop idling while no operation)
- 4) To implement the regular maintenance of machine used for construction and operation activities
- 5) To give awareness training to workers on machinery
- 6) To check and maintain the generator regularly

The continuous monitoring will be necessary to grasp the environmental conditions in Thilawa SEZ Zone A. The mitigation measures for environmental management will be considered in collected periodical environmental data and has to be reviewed in future.



# APPENDIX - HOURLY AIR RESULT





		со	NO <sub>2</sub>	TSP	PM <sub>10</sub>	SO <sub>2</sub>	Wind Speed	Wind	Direction
Date	Time	ppm	ppm	mg/m³	mg/m³	ppm	kph	Deg.	Direction
		Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly
6 Feb 2019	12:00 - 13:00	0.000	0.002	0.028	0.010	0.000	4.56	244	WSW
6 Feb 2019	13:00 ~ 14:00	0.000	0.002	0.016	0.006	0.000	4.71	268	W
6 Feb 2019	14:00 - 15:00	0.000	0.002	0.042	0.015	0.000	6.15	294	WNW
6 Feb 2019	15:00 - 16:00	0.000	0.002	0.060	0.022	0.000	4.88	246	WSW
6 Feb 2019	16:00 ~ 17:00	0.000	0.002	0.124	0.045	0.000	5.33	261	W
6 Feb 2019	17:00 ~ 18:00	0.000	0.002	0.259	0.094	0.000	4.40	279	W
6 Feb 2019	18:00 ~ 19:00	0.131	0.002	0.413	0.150	0.000	0.63	242	WSW
6 Feb 2019	19:00 ~ 20:00	0.304	0.005	0.191	0.069	0.119	0.03	240	WSW
6 Feb 2019	20:00 ~ 21:00	0.289	0.061	0.341	0.124	0.100	0.05	240	WSW
6 Feb 2019	21:00 - 22:00	0.318	0.064	0.146	0.053	0.108	0.18	198	SSW
6 Feb 2019	22:00 - 23:00	0.222	0.055	0.096	0.035	0.099	0.60	228	SW
6 Feb 2019	23:00 ~ 0:00	0.278	0.082	0.153	0.056	0.093	0.83	243	WSW
7 Feb 2019	0:00 ~ 1:00	0.258	0.102	0.168	0.061	0.067	0.83	243	WSW
7 Feb 2019	1:00 ~ 2:00	0.243	0.101	0.190	0.069	0.058	0.03	237	WSW
7 Feb 2019	2:00 ~ 3:00	0.222	0.102	0.185	0.067	0.047	0.08	226	SW
7 Feb 2019	3:00 ~ 4:00	0.237	0.108	0.211	0.077	0.047	0.35	232	SW
7 Feb 2019	4:00 ~ 5:00	0.244	0.121	0.292	0.106	0.046	0.39	249	WSW
7 Feb 2019	5:00 ~ 6:00	0.316	0.114	0.347	0.126	0.053	0.65	274	W
7 Feb 2019	6:00 ~ 7:00	0.340	0.121	0.591	0.215	0.050	0.10	79	ENE
7 Feb 2019	7:00 ~ 8:00	0.494	0.147	0.401	0.146	0.053	0.42	23	NNE
7 Feb 2019	8:00 - 9:00	0.461	0.110	0.528	0.192	0.050	1.88	47	NE
7 Feb 2019	9:00 ~ 10:00	0.311	0.040	0.294	0.107	0.008	1.43	92	E
7 Feb 2019	10:00 ~ 11:00	0.186	0.002	0.133	0.048	0.000	2.53	154	SSE
7 Feb 2019	11:00 - 12:00	0.080	0.002	0.069	0.025	0.000	2.68	117	ESE

Max	0.494 (0.566 mg/m <sup>3</sup> )	0.147 (0.277 mg/m³)	0.591	0.215	0.119 (0.311 mg/m <sup>3</sup> )
Avg	0.206 (0.235 mg/m <sup>3</sup> )	0.056 (0.106 mg/m <sup>3</sup> )	0.220	0.080	0.042 (0.109 mg/m <sup>3</sup> )
Min	0.000 (0.000 mg/m <sup>3</sup> )	0.002 (0.004 mg/m <sup>3</sup> )	0.016	0.006	0.000 (0.000 mg/m <sup>3</sup> )

		со	NO <sub>2</sub>	TSP	PM <sub>10</sub>	SO <sub>2</sub>	Wind Speed	Wind Direction	
Date	Time	ppm	ppm	mg/m³	mg/m³	ppm	kph Hourly	Deg.	Direction
		Hourly	Hourly	Hourly	Hourly	Hourly		Hourly	Hourly
7 Feb 2019	12:00 ~ 13:00	0.042	0.002	0.045	0.016	0.000	3.31	186	S
7 Feb 2019	13:00 ~ 14:00	0.000	0.002	0.052	0.019	0.000	3.21	122	ESE
7 Feb 2019	14:00 ~ 15:00	0.000	0.002	0.065	0.024	0.000	4.20	207	SSW
7 Feb 2019	15:00 ~ 16:00	0.000	0.002	0.094	0.034	0.000	4.53	175	S
7 Feb 2019	16:00 ~ 17:00	0.009	0.002	0.300	0.109	0.000	8.26	146	SE
7 Feb 2019	17:00 ~ 18:00	0.113	0.002	0.348	0.127	0.000	7.56	148	SSE
7 Feb 2019	18:00 ~ 19:00	0.273	0.023	0.357	0.130	0.040	2.23	143	SE
7 Feb 2019	19:00 ~ 20:00	0.514	0.105	0.394	0.143	0.115	0.00	147	SSE
7 Feb 2019	20:00 ~ 21:00	0.500	0.124	0.324	0.118	0.128	0.02	147	SSE
7 Feb 2019	21:00 ~ 22:00	0.488	0.129	0.347	0.126	0.132	0.04	151	SSE
7 Feb 2019	22:00 ~ 23:00	0.321	0.134	0.499	0.181	0.120	0.10	182	S
7 Feb 2019	23:00 ~ 0:00	0.183	0.127	0.231	0.084	0.086	0.23	203	SSW
8 Feb 2019	0:00 ~ 1:00	0.262	0.137	0.266	0.097	0.066	1.69	246	WSW
8 Feb 2019	1:00 ~ 2:00	0.242	0.143	0.253	0.092	0.072	0.99	255	WSW
8 Feb 2019	2:00 ~ 3:00	0.257	0.153	0.417	0.152	0.075	0.01	241	WSW
8 Feb 2019	3:00 ~ 4:00	0.255	0.144	0.385	0.140	0.071	1.09	277	W
8 Feb 2019	4:00 ~ 5:00	0.250	0.142	0.438	0.159	0.065	0.35	318	NW
8 Feb 2019	5:00 ~ 6:00	0.279	0.150	0.606	0.220	0.069	0.22	347	NNW
8 Feb 2019	6:00 ~ 7:00	0.465	0.151	1.057	0.384	0.108	0.03	350	N
8 Feb 2019	7:00 ~ 8:00	0.618	0.157	0.604	0.220	0.098	0.10	351	N
8 Feb 2019	8:00 ~ 9:00	0.428	0.120	0.626	0.228	0.085	2.60	89	E
8 Feb 2019	9:00 ~ 10:00	0.323	0.054	0.345	0.126	0.027	3.64	151	SSE
8 Feb 2019	10:00 ~ 11:00	0.282	0.009	0.218	0.079	0.003	3.35	309	NW
8 Feb 2019	11:00 ~ 12:00	0.093	0.002	0.100	0.036	0.000	3.43	255	WSW

Max	0.618 (0.708 mg/m <sup>3</sup> )	0.157 (0.296 mg/m <sup>3</sup> )	1.057	0.384	0.132 (0.345 mg/m <sup>3</sup> )
Avg	0.258 (0.296 mg/m <sup>3</sup> )	0.084 (0.158 mg/m <sup>3</sup> )	0.349	0.127	0.057 0.148 mg/m <sup>3</sup> )
Min	0.000 (0.000 mg/m <sup>3</sup> )	0,002 (0.004 mg/m³)	0.045	0.016	0.000 (0.000 mg/m³)





				со	NO <sub>2</sub>	TSP	PM10	SO <sub>2</sub>	Wind Speed	Wind	Direction
Date		Time		ppm	ppm	mg/m³	mg/m³	ppm	kph	Deg.	Direction
				Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly
8 Feb 2019	12:00	-	13:00	0.098	0.002	0.038	0.014	0.000	3.23	169	S
8 Feb 2019	13:00	1	14:00	0.001	0.002	0.086	0.031	0.000	2.85	200	SSW
8 Feb 2019	14:00	-	15:00	0.012	0.002	0.122	0.044	0.000	2.84	240	WSW
8 Feb 2019	15:00	-	16:00	0.002	0.002	0.227	0.082	0.000	4.26	267	W
8 Feb 2019	16:00	-	17:00	0.001	0.002	0.283	0.103	0.000	3.15	173	S
8 Feb 2019	17:00	-	18:00	0.148	0.002	0.429	0.156	0.001	1.32	156	SSE
8 Feb 2019	18:00	~	19:00	0.508	0.003	0.816	0.297	0.047	0.38	146	SE
8 Feb 2019	19:00	~	20:00	0.529	0.053	0.600	0.218	0.124	0.45	164	SSE
8 Feb 2019	20:00	4:	21:00	0.539	0.058	0.503	0.183	0.148	0.15	192	SSW
8 Feb 2019	21:00	~:	22:00	0.318	0.061	0.337	0.123	0.127	0.59	218	SW
8 Feb 2019	22:00	~	23:00	0.256	0.073	0.187	0.068	0.091	0.71	222	SW
8 Feb 2019	23:00	~	0:00	0.245	0.090	0.206	0.075	0.078	1.04	216	SW
9 Feb 2019	0:00	(40)	1:00	0.243	0.105	0.172	0.063	0.069	2.69	246	WSW
9 Feb 2019	1:00	-	2:00	0.254	0.122	0.216	0.079	0.058	0.25	254	WSW
9 Feb 2019	2:00	-	3:00	0.238	0.111	0.212	0.077	0.061	1.28	249	WSW
9 Feb 2019	3:00	~ .	4:00	0.243	0.113	0.235	0.086	0.060	0.62	262	W
9 Feb 2019	4:00	-	5:00	0.241	0.113	0.269	0.098	0.058	0.08	286	WNW
9 Feb 2019	5:00	-	6:00	0.472	0.131	0.630	0.229	0.120	0.65	259	W
9 Feb 2019	6:00	-	7:00	0.663	0.133	0.986	0.359	0.329	0.38	143	SE
9 Feb 2019	7:00	~	8:00	0.445	0.138	0.377	0.137	0.090	0.33	85	E
9 Feb 2019	8:00	~	9:00	0.348	0.101	0.445	0.162	0.040	1.83	40	NE
9 Feb 2019	9:00	-	10:00	0.272	0.017	0.301	0.110	0.000	2,48	177	S
9 Feb 2019	10:00	~	11:00	0.208	0.002	0.196	0.071	0.000	1.84	270	W
9 Feb 2019	11:00	-	12:00	0.200	0.002	0.160	0.058	0.000	2.22	279	W

Max	0.663 (0.760 mg/m <sup>3</sup> )	0.138 (0.260 mg/m <sup>3</sup> )	0.986	0.359	0.329 (0.862 mg/m³)
Avg	0.270 (0.309 mg/m <sup>3</sup> )	0.060 (0.113 mg/m³)	0.335	0.122	0.062 (0.164 mg/m <sup>3</sup> )
Min	0.001 (0.001 mg/m³)	0.002 (0.004 mg/m³)	0.038	0.014	0.000 (0.000 mg/m <sup>3</sup> )

			со	NO <sub>2</sub>	TSP	PM <sub>10</sub>	SO <sub>2</sub>	Wind Speed	Wind I	Direction
Date	Tim	ie	ppm	ppm	mg/m³	mg/m³	ppm	kph	Deg.	Direction
34. J			Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly
9 Feb 2019	12:00 ~	13:00	0.084	0.002	0.096	0.035	0.000	2.49	282	WNW
9 Feb 2019	13:00 ~	14:00	0.001	0.002	0.113	0.041	0.000	4.56	289	WNW
9 Feb 2019	14:00 ~	15:00	0.000	0.002	0.167	0.061	0.000	5.23	296	WNW
9 Feb 2019	15:00 ~	16:00	0.000	0.002	0.157	0.057	0.000	6.06	296	WNW
9 Feb 2019	16:00 ~	17:00	0.000	0.002	0.213	0.078	0.000	6.63	263	W
9 Feb 2019	17:00 ~	18:00	0.048	0.002	0.333	0.121	0.000	4.63	222	SW
9 Feb 2019	18:00 ~	19:00	0.160	0.002	0.421	0.153	0.002	2.57	151	SSE
9 Feb 2019	19:00 ~	20:00	0.338	0.026	0.316	0.115	0.096	1.73	150	SSE
9 Feb 2019	20:00 ~	21:00	0.513	0.064	0.272	0.099	0.140	0.29	144	SE
9 Feb 2019	21:00 ~	22:00	0.439	0.087	0.332	0.121	0.137	0.13	144	SE
9 Feb 2019	22:00 ~	23:00	0.309	0.106	0.362	0.132	0.127	0.41	185	S
9 Feb 2019	23:00 ~	0:00	0.278	0.120	0.250	0.091	0.092	2.62	235	SW
10 Feb 2019	0:00 ~	1:00	0.242	0.109	0.198	0.072	0.070	3.85	251	WSW
10 Feb 2019	1:00 ~	2:00	0.211	0.099	0.190	0.069	0.050	0.87	262	W
10 Feb 2019	2:00 ~	3:00	0.190	0.084	0.179	0.065	0.035	0.58	279	W
10 Feb 2019	3:00 ~	4:00	0.151	0.057	0.112	0.041	0.006	2.63	284	WNW
10 Feb 2019	4:00 ~	5:00	0.128	0.045	0.124	0.045	0.008	0.83	278	W
10 Feb 2019	5:00 ~	6:00	0.118	0.033	0.093	0.034	0.035	2.65	275	W
10 Feb 2019	6:00 ~	7:00	0.145	0.031	0.106	0.038	0.088	1.99	267	W
10 Feb 2019	7:00 ~	8:00	0.137	0.037	0.116	0.042	0.081	3.79	270	W
10 Feb 2019	8:00 ~	9:00	0.141	0.007	0.120	0.044	0.000	3.07	268	W
10 Feb 2019	9:00 ~	10:00	0.126	0.002	0.069	0.025	0.000	3.39	325	NW
10 Feb 2019	10:00 ~	11:00	0.044	0.002	0.025	0.009	0.000	3.90	322	NW
10 Feb 2019	11:00 ~	12:00	0.007	0.002	0.012	0.004	0.000	3.94	314	NW

Max	0.513 (0.588 mg/m³)	0.120 (0.225 mg/m³)	0.421	0.153	0.140 (0.366 mg/m <sup>3</sup> )
Avg	0.159 (0.182 mg/m³)	0.038 (0.072 mg/m³)	0.182	0.066	0.040 (0.105 mg/m <sup>3</sup> )
Min	0.000 (0.000 mg/m <sup>3</sup> )	0.002 (0.004 mg/m <sup>3</sup> )	0.012	0.004	0.000 (0.000 mg/m <sup>3</sup> )





			со	NO <sub>2</sub>	TSP	PM <sub>10</sub>	SO <sub>2</sub>	Wind Speed	Wind I	Direction
Date	Tim	e	ppm	ppm	mg/m³	mg/m³	ppm	kph	Deg.	Direction
			Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly
10 Feb 2019	12:00 ~	13:00	0.000	0.002	0.008	0.003	0.000	5.35	278	W
10 Feb 2019	13:00 ~	14:00	0.000	0.002	0.020	0.007	0.000	7.10	268	W
10 Feb 2019	14:00 ~	15:00	0.000	0.002	0.044	0.016	0.000	8.42	267	W
10 Feb 2019	15:00 ~	16:00	0.000	0.002	0.064	0.023	0.000	7.08	265	W
10 Feb 2019	16:00 ~	17:00	0.000	0.002	0.094	0.034	0.000	6.90	206	SSW
10 Feb 2019	17:00 ~	18:00	0.027	0.002	0.239	0.087	0.000	6.54	149	SSE
10 Feb 2019	18:00 ~	19:00	0.183	0.002	0.239	0.087	0.042	3.33	151	SSE
10 Feb 2019	19:00 ~	20:00	0.271	0.035	0.183	0.067	0.139	3.50	150	SSE
10 Feb 2019	20:00 ~	21:00	0.371	0.087	0.300	0.109	0.161	1.56	160	SSE
10 Feb 2019	21:00 ~	22:00	0.336	0.068	0.367	0.133	0.099	0.47	222	SW
10 Feb 2019	22:00 ~	23:00	0.277	0.083	0.244	0.089	0.086	0.96	211	SSW
10 Feb 2019	23:00 ~	0:00	0.228	0.082	0.228	0.083	0.059	0.10	256	WSW
11 Feb 2019	0:00 ~	1:00	0.217	0.084	0.185	0.067	0.104	1.31	260	W
11 Feb 2019	1:00 ~	2:00	0.221	0.091	0.228	0.083	0.405	1.76	264	W
11 Feb 2019	2:00 ~	3:00	0.223	0.107	0.306	0.111	0.141	0.24	271	W
11 Feb 2019	3:00 ~	4:00	0.220	0.124	0.366	0.133	0.074	0.41	239	WSW
11 Feb 2019	4:00 ~	5:00	0.238	0.129	0.661	0.240	0.069	0.48	268	W
11 Feb 2019	5:00 ~	6:00	0.217	0.134	1.398	0.508	0.063	1.73	288	WNW
11 Feb 2019	6:00 ~	7:00	0.319	0.130	2.988	1.087	0.057	1.63	165	SSE
11 Feb 2019	7:00 ~	8:00	0.330	0.142	1.333	0.485	0.058	1.68	128	SE
11 Feb 2019	8:00 ~	9:00	0.383	0.133	0.508	0.185	0.077	1.89	184	S
11 Feb 2019	9:00 ~	10:00	0.320	0.061	0.447	0.163	0.033	2.65	288	WNW
11 Feb 2019	10:00 ~	11:00	0.341	0.012	0.353	0.128	0.003	3.89	319	NW
11 Feb 2019	11:00 ~	12:00	0.373	0.002	0.300	0.109	0.001	3.44	308	NW

Ġ	Max	0.383 (0.439 mg/m <sup>3</sup> )	0.142 (0.266 mg/m <sup>3</sup> )	2.988	1.087	0.405 (1.059 mg/m³)
	Avg	0.212 (0.243 mg/m <sup>3</sup> )	0.063 0.119 mg/m³)	0.463	0.168	0.070 (0.182 mg/m <sup>3</sup> )
	Min	0.000 (0.000 mg/m <sup>3</sup> )	0.002 (0.004 mg/m³)	0.008	0.003	0.000 (0.000 mg/m <sup>3</sup> )

		со	NO <sub>2</sub>	TSP	PM <sub>10</sub>	SO <sub>2</sub>	Wind Speed	Wind	Direction
Date	Time	ppm	ppm	mg/m³	mg/m³	ppm	kph	Deg.	Direction
		Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly
11 Feb 2019	12:00 ~ 13:00	0.338	0.002	0.330	0.120	0.000	4.78	129	SE
11 Feb 2019	13:00 ~ 14:00	0.116	0.002	0.199	0.072	0.000	3.45	318	NW
11 Feb 2019	14:00 ~ 15:00	0.005	0.002	0.104	0.038	0.000	3.18	260	W
11 Feb 2019	15:00 ~ 16:00	0.000	0.002	0.120	0.044	0.005	3.13	272	W
11 Feb 2019	16:00 ~ 17:00	0.193	0.002	0.452	0.164	0.228	7.07	217	SW
11 Feb 2019	17:00 ~ 18:00	0.093	0.002	0.393	0.143	0.662	9.07	145	SE
11 Feb 2019	18:00 ~ 19:00	0.290	0.003	0.473	0.172	0.221	3.05	156	SSE
11 Feb 2019	19:00 ~ 20:00	0.398	0.045	0.439	0.160	0.177	0.23	141	SE
11 Feb 2019	20:00 ~ 21:00	0.554	0.086	0.639	0.232	0.163	0.70	155	SSE
11 Feb 2019	21:00 ~ 22:00	0.431	0.104	0.529	0.193	0.139	0.78	143	SE
11 Feb 2019	22:00 ~ 23:00	0.437	0.120	0.584	0.212	0.122	0.05	136	SE
11 Feb 2019	23:00 ~ 0:00	0.310	0.127	0.498	0.181	0.098	0.08	136	SE
12 Feb 2019	0:00 ~ 1:00	0.177	0.110	0.249	0.091	0.059	1.07	200	SSW
12 Feb 2019	1:00 ~ 2:00	0.280	0.118	0.306	0.111	0.058	1.48	239	WSW
12 Feb 2019	2:00 ~ 3:00	0.284	0.119	0.324	0.118	0.064	1.77	249	WSW
12 Feb 2019	3:00 ~ 4:00	0.281	0.126	0.437	0.159	0.069	0.88	238	WSW
12 Feb 2019	4:00 ~ 5:00	0.279	0.135	0.667	0.242	0.062	0.58	187	S
12 Feb 2019	5:00 ~ 6:00	0.371	0.139	0.843	0.307	0.072	0.09	141	SE
12 Feb 2019	6:00 ~ 7:00	0.308	0.139	0.961	0.350	0.064	0.18	61	ENE
12 Feb 2019	7:00 ~ 8:00	0.340	0.143	0.713	0.259	0.069	1.24	70	ENE
12 Feb 2019	8:00 ~ 9:00	0.370	0.127	0.566	0.206	0.073	2.58	47	NE
12 Feb 2019	9:00 ~ 10:00	0.301	0.072	0.443	0.161	0.051	3.48	49	NE
12 Feb 2019	10:00 ~ 11:00	0.191	0.007	0.231	0.084	0.024	3.49	71	ENE
12 Feb 2019	11:00 ~ 12:00	0.139	0.002	0.112	0.041	0.043	4.36	107	ESE

Max	0.554 (0.635 mg/m <sup>3</sup> )	0.143 (0.268 mg/m³)	0.961	0.350	0.662 (1.733 mg/m³)
Avg	0.270 (0.309 mg/m <sup>3</sup> )	0.072 (0.135 mg/m <sup>3</sup> )	0.442	0.161	0.105 (0.275 mg/m <sup>3</sup> )
Min	0.000 (0.000 mg/m <sup>3</sup> )	0.002 (0.004 mg/m <sup>3</sup> )	0.104	0.038	0.000 (0.000 mg/m <sup>3</sup> )





		со	NO <sub>2</sub>	TSP	PM <sub>10</sub>	SO <sub>2</sub>	Wind Speed	Wind	Direction
Date	Time	ppm	ppm	mg/m³	mg/m³	ppm	kph	Deg.	Direction
		Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly
12 Feb 2019	12:00 ~ 13:00	0.044	0.002	0.059	0.021	0.066	5.08	145	SE
12 Feb 2019	13:00 ~ 14:00	0.048	0.002	0.187	0.068	0.114	5.48	189	S
12 Feb 2019	14:00 ~ 15:00	0.029	0.002	0.144	0.052	0.119	8.92	151	SSE
12 Feb 2019	15:00 ~ 16:00	0.023	0.002	0.177	0.064	0.122	7.77	147	SSE
12 Feb 2019	16:00 ~ 17:00	0.086	0.002	0.274	0.100	0.123	5.42	151	SSE
12 Feb 2019	17:00 ~ 18:00	0.295	0.002	0.395	0.144	0.145	1.78	149	SSE
12 Feb 2019	18:00 ~ 19:00	0.289	0.002	0.462	0.168	0.166	0.37	198	SSW
12 Feb 2019	19:00 ~ 20:00	0.373	0.025	0.274	0.100	0.154	0.04	237	WSW
12 Feb 2019	20:00 ~ 21:00	0.252	0.026	0.282	0.103	0.102	0.04	222	SW
12 Feb 2019	21:00 ~ 22:00	0.363	0.055	0.429	0.156	0.114	0.20	197	SSW
12 Feb 2019	22:00 ~ 23:00	0.249	0.064	0.258	0.094	0.088	0.10	183	S
12 Feb 2019	23:00 ~ 0:00	0.248	0.069	0.258	0.094	0.068	0.03	176	S
13 Feb 2019	0:00 ~ 1:00	0.178	0.077	0.173	0.063	0.050	0.53	239	WSW
13 Feb 2019	1:00 ~ 2:00	0.219	0.078	0.181	0.066	0.061	0.53	241	WSW
13 Feb 2019	2:00 ~ 3:00	0.240	0.109	0.228	0.083	0.057	0.13	226	SW
13 Feb 2019	3:00 ~ 4:00	0.255	0.112	0.286	0.104	0.058	0.48	167	SSE
13 Feb 2019	4:00 ~ 5:00	0.253	0.119	0.298	0.108	0.054	0.35	258	WSW
13 Feb 2019	5:00 ~ 6:00	0.652	0.129	0.709	0.258	0.130	0.00	226	SW
13 Feb 2019	6:00 ~ 7:00	0.593	0.138	0.982	0.357	0.106	0.05	203	SSW
13 Feb 2019	7:00 ~ 8:00	0.544	0.140	0.446	0.162	0.096	0.52	92	Е
13 Feb 2019	8:00 ~ 9:00	0.426	0.126	0.666	0.242	0.096	2.57	73	ENE
13 Feb 2019	9:00 ~ 10:00	0.316	0.050	0.408	0.148	0.064	1.43	86	Е
13 Feb 2019	10:00 ~ 11:00	0.278	0.002	0.268	0.098	0.060	2.14	245	WSW
13 Feb 2019	11:00 ~ 12:00	0.163	0.002	0.178	0.065	0.068	2.91	322	NW

Max	0.652 (0.746 mg/m <sup>3</sup> )	0.140 (0.264 mg/m³)	0.982	0.357	0.166 (0.435 mg/m <sup>3</sup> )
Avg	0.267 (0.306 mg/m <sup>3</sup> )	0.056 (0.105 mg/m <sup>3</sup> )	0.334	0.122	0.095 (0.249 mg/m <sup>3</sup> )
Min	0.023 (0.026 mg/m <sup>3</sup> )	0.002 (0.004 mg/m³)	0.059	0.021	0.050 (0.131 mg/m <sup>3</sup> )



## Thilawa Special Economic Zone (Zone A) Development Project (Operation Phase)

### **Appendix**

Noise and Vibration Monitoring Report February, 2019



# NOISE AND VIBRATION MONITORING REPORT FOR DEVELOPMENT OF INDUSTRIAL AREA THILAWA SEZ ZONE A (OPERATION STAGE)

(BI-ANNUALLY MONITORING)

### February 2019 Myanmar Koei International Ltd.



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### CHAPTER 1: OUTLINES AND SUMMARY OF MONITORING PLAN

### 1.1 General

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

### 1.2 Outlines of Monitoring Plan

To assess the environmental conditions under the operation of industrial area in and around Thilawa SEZ Zone A, noise and vibration levels had been monitored from 6 February 2019 – 9 February 2019 as follows;

Table 1.2-1 Outlines of Noise and Vibration Level Monitoring

Monitoring Date	Monitoring Item	Parameters	Number of Points	Duration	Monitoring Methodology
From 6 February – 7 February, 2019	Noise Level	LAeq(dB)	1 (NV-1)	24 hours	On-site measurement by "Rion NL-42 sound level meter"
From 7 February – 8 February, 2019	Noise Level	L <sub>Aeq</sub> (dB)	1 (NV-2)	24 hours	On-site measurement by "Rion NL-42 sound level meter"
From 8 February – 9 February, 2019	Noise Level	L <sub>Aeq</sub> (dB)	1 (NV-3)	24 hours	On-site measurement by "Rion NL-42 sound level meter"
From 6 February – 7 February, 2019	Vibration Level	L <sub>v10</sub> (dB)	1 (NV-1)	24 hours	On-site measurement by "Vibration Level Meter- VM-53A"
From 7 February – 8 February, 2019	Vibration Level	L <sub>v10</sub> (dB)	1 (NV-2)	24 hours	On-site measurement by "Vibration Level Meter- VM-53A"
From 8 February – 9 February, 2019	Vibration Level	Lv10 (dB)	1 (NV-3)	24 hours	On-site measurement by "Vibration Level Meter- VM-53A"



### **CHAPTER 2: NOISE AND VIBRATION LEVEL MONITORING**

### 2.1 Monitoring Item

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

Table 2.1-1 Monitoring Parameters for Noise and Vibration Level

No.	Item	Parameter
1	Noise	A-weighted loudness equivalent (LAeq)
2	Vibration	Vibration level, vertical, percentile (Lv10)

### 2.2 Monitoring Location

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

Table 2.2-1 Location of Noise and Vibration Monitoring Station

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



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



### NV-1

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

### NV-2

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

### NV-3

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



### 2.3 Monitoring Method

Noise level was measured by "Rion NL-42 sound level meter" and automatically recorded every 10 minutes in a memory card. The vibration level meter was, VM-53A (Rion Co. Ltd., Japan), accompanied by a 3-axis accelerometer PV-83C (Rion Co., Ltd.) was placed on solid soil ground. Vertical vibration (Z axis), L<sub>v</sub>, was measured every 10 minutes within the adaptable range of (10-70) dB at NV-1, (10-70) dB at NV-2, and (10-70) dB at NV-3 and recorded to a memory card.

The measurement period of noise and vibration was 24 hours for each monitoring point. The status of the noise and vibration level monitoring on NV-1, NV-2 and NV-3 are shown in Figure 2.3-1

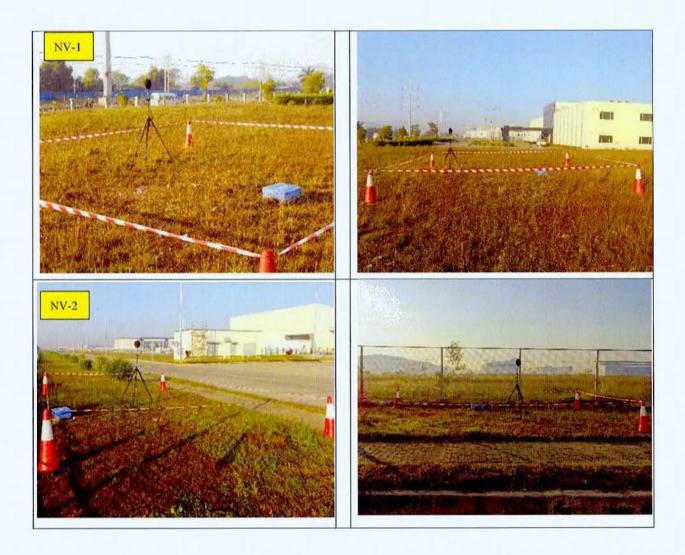






Figure 2.3-1 Status of Noise and Vibration Level Monitoring at NV-1, NV-2 and NV-3



### 2.4 Monitoring Results

### **Noise Monitoring Results**

Noise monitoring results are separated daytime (6:00 AM to 10:00 PM), night time (10:00 PM to 6:00 AM) time frames for NV-1, daytime (7:00 AM to 7:00 PM), evening time (7:00 PM to 10:00 PM), and night time (10:00 PM to 7:00 AM) time frames respectively for NV-2 and NV-3. Noise measurement was carried out for one location on a 24-hour basis. The monitoring results are summarized in Table 2.4-1, Table 2.4-2, and Table 2.4-3 respectively. Hourly noise level monitoring results for NV-1, NV-2 and NV-3 are shown in Table 2.4-4, Table 2.4-5 and Table 2.4-6. Comparing with the target value of noise level in operation stage prescribed in EIA report for Thilawa SEZ development project Zone A, all results were under the target values at NV-1, NV-2 and NV-3.

Table 2.4-1 Results of Noise Levels (LAeq) Monitoring at NV-1

Date	(Traffic Noise Level) Equivalent Noise Level (LAcq, dB)		
Date	Day Time (6:00 AM - 10:00 PM)	Night Time (10:00 PM - 6:00 AM)	
6 February – 7 February, 2019	58	54	
Target Value	75	70	

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

Table 2.4-2 Results of Noise Levels (LAcc) Monitoring at NV-2

Date	(Commercial and Industrial Areas) Equivalent Noise Level (LAeq, dB)				
Date	Day Time (7:00 AM - 7:00 PM)	Evening Time (7:00 PM - 10:00 PM)	Night Time (10:00 PM - 7:00 AM)		
7 February - 8 February, 2019	62	57	53		
Target Value	70	65	60		

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

Table 2.4-3 Results of Noise Levels (LAcq) Monitoring at NV-3

Date	(Commercial and Industrial Areas)  Equivalent Noise Level (LAcq, dB)				
Part I	Day Time (7:00 AM - 7:00 PM)	Evening Time (7:00 PM – 10:00 PM)	Night Time (10:00 PM - 7:00 AM)		
8 February - 9 February, 2019	47	50	45		
Target Value	70	65	60		

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



Table 2.4-4 Hourly Noise Level ( $L_{\text{Aeq}}$ ) Monitoring Results at NV-1

100,000,000,000		( ineq)				
Date	Time	(LAcq, dB)	(L <sub>Aeq</sub> , dB) Each Category	(L <sub>Aeq</sub> , dB) Target Value		
	6:00-7:00	58				
	7:00-8:00	59				
	8:00-9:00	57				
	9:00-10:00	58				
	10:00-11:00	57				
	11:00-12:00	57		-		
	12:00-13:00	57		75		
	13:00-14:00	57	58			
	14:00-15:00	57				
	15:00-16:00	59				
	16:00-17:00	58				
6 February – 7	17:00-18:00	58				
ebruary, 2019	18:00-19:00	59				
	19:00-20:00	58				
	20:00-21:00	58				
	21:00-22:00	57				
	22:00-23:00	57				
	23:00-24:00	56				
	24:00-1:00	55				
	1:00-2:00	55	5.4	70		
	2:00-3:00	53	54	70		
	3:00-4:00	53				
	4:00-5:00	52				
	5:00-6:00	53				

Table 2.4-5 Hourly Noise Level (LAeq) Monitoring Results at NV-2

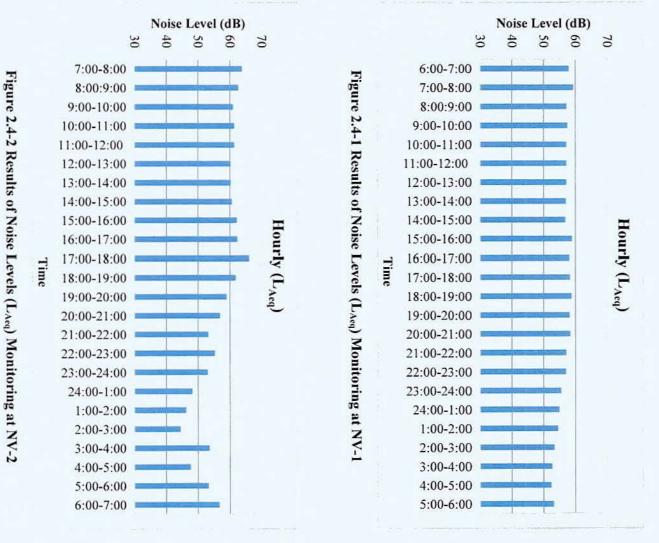
Date	Time	(LAcq, dB)	(L <sub>Aeq</sub> , dB) Each Category	(L <sub>Aeq</sub> , dB) Target Value
NESSER A TIMES	7:00-8:00	64	TO SEE THE CO. CO.	
	8:00-9:00	63		
	9:00-10:00	61		
	10:00-11:00	61		
	11:00-12:00	61		
	12:00-13:00	60	62	70
	13:00-14:00	60	62	70
	14:00-15:00	61		
	15:00-16:00	62		
	16:00-17:00	62		
	17:00-18:00	66		
7 February - 8	18:00-19:00	62		
February, 2019	19:00-20:00	59		
	20:00-21:00	57	57	65
	21:00-22:00	53		
	22:00-23:00	55		
	23:00-24:00	53		
	24:00-1:00	48		
	1:00-2:00	46		
	2:00-3:00	44	53	60
	3:00-4:00	54		
	4:00-5:00	48		
	5:00-6:00	53		
	6:00-7:00	57		



Table 2.4-6 Hourly Noise Level (LAeq) Monitoring Results at NV-3

Time	(LAeq, dB)	(L <sub>Aeq</sub> , dB) Each Category	(L <sub>Aeq</sub> , dB) Target Value
7:00-8:00	52		
8:00-9:00	48		
9:00-10:00	46		
10:00-11:00	43		
11:00-12:00	44		
12:00-13:00	44	17	70
13:00-14:00	41	47	70
14:00-15:00	43		
15:00-16:00	45		
16:00-17:00	47		
17:00-18:00	49		
18:00-19:00	48		
19:00-20:00	50	50	65
20:00-21:00	51		
21:00-22:00	48		
22:00-23:00	45		
23:00-24:00	45		60
24:00-1:00	43	45	
1:00-2:00	42		
2:00-3:00	41		
3:00-4:00	42		
4:00-5:00	44		
5:00-6:00	49	1	
	7:00-8:00 8:00-9:00 9:00-10:00 10:00-11:00 11:00-12:00 12:00-13:00 13:00-14:00 14:00-15:00 15:00-16:00 16:00-17:00 17:00-18:00 18:00-19:00 20:00-21:00 21:00-22:00 22:00-23:00 24:00-1:00 1:00-2:00 2:00-21:00 1:00-2:00 2:00-23:00 3:00-4:00 4:00-5:00	7:00-8:00 52 8:00-9:00 48 9:00-10:00 46 10:00-11:00 43 11:00-12:00 44 12:00-13:00 44 13:00-14:00 41 14:00-15:00 43 15:00-16:00 45 16:00-17:00 47 17:00-18:00 49 18:00-19:00 48 19:00-20:00 50 20:00-21:00 51 21:00-22:00 48 22:00-23:00 45 23:00-24:00 45 24:00-1:00 45 2:00-3:00 41 3:00-4:00 42 4:00-5:00 44	7:00-8:00 52 8:00-9:00 48 9:00-10:00 46 10:00-11:00 43 11:00-12:00 44 12:00-13:00 44 13:00-14:00 41 14:00-15:00 43 15:00-16:00 45 16:00-17:00 47 17:00-18:00 49 18:00-19:00 48 19:00-20:00 50 20:00-21:00 51 50 21:00-22:00 48 22:00-23:00 45 23:00-24:00 45 24:00-1:00 43 1:00-2:00 42 2:00-3:00 41 45 3:00-4:00 42 4:00-5:00 44







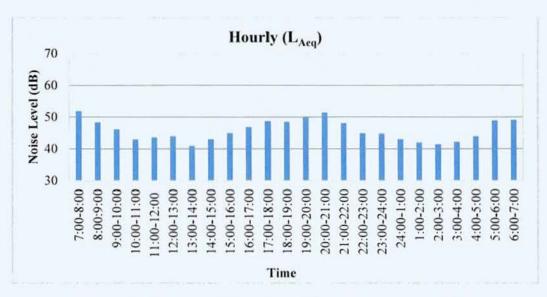


Figure 2.4-3 Results of Noise Levels (LAeq) Monitoring at NV-3

### Vibration Monitoring Results

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

Table 2.4-7 Results of Vibration Levels (L<sub>v10</sub>) Monitoring at NV-1

Date	(Office, commercial facilities, and factories)  Equivalent Vibration Level (L <sub>v10</sub> , dB)			
Date	Day Time (7:00 AM - 7:00 PM)	Evening Time (7:00 PM – 10:00 PM)	Night Time (10:00 PM - 7:00 AM)	
6 February - 7 February, 2019	47	44	40	
Target Value	70	65	65	

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

Table 2.4-8 Results of Vibration Levels (Lvia) Monitoring at NV-2

Table 2.4-0 K	(Office, commercial facilities, and factories)  Equivalent Vibration Level (Lv10, dB)				
Date	Day Time (7:00 AM - 7:00 PM)	Evening Time (7:00 PM – 10:00 PM)	Night Time (10:00 PM - 7:00 AM)		
7 February - 8 February, 2019	36	33	27		
Target Value	70	65	65		

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

Table 2.4-9 Results of Vibration Levels (Lv10) Monitoring at NV-3

Pote	(Office, commercial facilities, and factories)  Equivalent Vibration Level (L <sub>v10</sub> , dB)			
Date	Day Time (7:00 AM - 7:00 PM)	Evening Time (7:00 PM - 10:00 PM)	Night Time (10:00 PM - 7:00 AM)	
8 February - 9 February, 2019	29	27	22	
Target Value	70	65	65	

Aurget value is applied to the vibration level during the operation stage in the EIA Report for Thilawa SEZ Development (Industrial Area of Zone A).

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

Date	Time	(L <sub>v10</sub> , dB)	(L <sub>v10</sub> , dB) Each Category	(L <sub>v10</sub> , dB) Target Value
	7:00-8:00	44		
	8:00-9:00	43		
	9:00-10:00	46		
	10:00-11:00	47		
	11:00-12:00	48		
	12:00-13:00	47	47	70
	13:00-14:00	46	47	70
	14:00-15:00	46		
	15:00-16:00	48		
	16:00-17:00	47		
	17:00-18:00	48		
6 February – 7	18:00-19:00	47		
February, 2019	19:00-20:00	45		65
SANCOARS POPULACIONALIS POPULACIONAL	20:00-21:00	44	44	
	21:00-22:00	41		
	22:00-23:00	41		
	23:00-24:00	42		
	24:00-1:00	42		
	1:00-2:00	38		
	2:00-3:00	40	40	65
	3:00-4:00	36		
	4:00-5:00	38		
	5:00-6:00	37		
	6:00-7:00	41		

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

Date	Time	(L <sub>v10</sub> , dB)	(Lv10, dB) Each Category	(L <sub>v10</sub> , dB) Target Value
E COMMENT AND A PORT (SEP)	7:00-8:00	37		
	8:00-9:00	36		
	9:00-10:00	36		
	10:00-11:00	36		
	11:00-12:00	36		
	12:00-13:00	36	36	70
	13:00-14:00	35	36	
	14:00-15:00	36		
	15:00-16:00	37		
	16:00-17:00	36		
	17:00-18:00	38		
7 February - 8	18:00-19:00	34		
February, 2019	19:00-20:00	33		65
	20:00-21:00	34	33	
	21:00-22:00	31		
	22:00-23:00	28		
	23:00-24:00	30		
	24:00-1:00	28		
	1:00-2:00	22		
	2:00-3:00	19	27	65
	3:00-4:00	24		
	4:00-5:00	19		
	5:00-6:00	25		
	6:00-7:00	31		



Table 2.4-12 Results of Hourly Vibration Levels (Lv10) Monitoring at NV-3

Date	Time	(L <sub>v10</sub> , dB)	(L <sub>v10</sub> , dB) Each Category	(L <sub>v10</sub> , dB) Target Value		
	7:00-8:00	30				
	8:00-9:00	27				
	9:00-10:00	30				
	10:00-11:00	27				
	11:00-12:00	26				
	12:00-13:00	27	20	70		
	13:00-14:00	27	29	70		
	14:00-15:00	29				
	15:00-16:00	28				
	16:00-17:00	30				
	17:00-18:00	30				
8 February – 9	18:00-19:00	30				
February, 2019	19:00-20:00	27	27	65		
	20:00-21:00	28				
	21:00-22:00	23				
	22:00-23:00	25				
	23:00-24:00	25				
	24:00-1:00	19				
	1:00-2:00	21				
	2:00-3:00	19	22	65		
	3:00-4:00	18				
	4:00-5:00	20				
	5:00-6:00	18				
	6:00-7:00	24				



Figure 2.4-4 Results of Vibration Levels (Lv10) Monitoring at NV-1



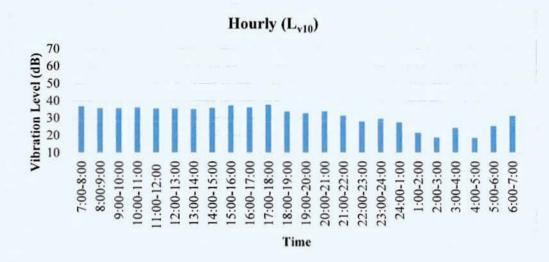


Figure 2.4-5 Results of Vibration Levels (Lv10) Monitoring at NV-2

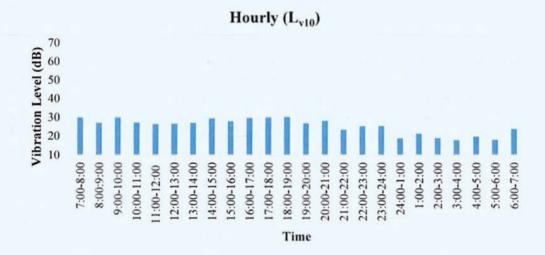


Figure 2.4-6 Results of Vibration Levels (Lv10) Monitoring at NV-3



### **CHAPTER 3: CONCLUSION AND RECOMMENDATION**

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

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





# Thilawa Special Economic Zone (Zone A) Development Project (Operation Phase)

### **Appendix**

Soil contamination survey in Thilawa SEZ

December, 2018





### SOIL CONTAMINATION SUREVEY IN THILAWA SEZ (ZONE A)

### December 2018



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

Tel: (959) 7301 3448; Fax: (951) 552901

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### Soil Contamination Survey in Thilawa SEZ (Zone-A)

### Survey Item

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

Table 1 Survey parameter for soil quality

	. Parameter Unit		Standard		
No.	Parameter	Unit	Japan	Thailand	Vietnam
1	рН				-
2	Mercury	mg/kg	15	610	*
3	Arsenic	mg/kg	150	27	12
4	Lead	mg/kg	150	750	300
5	Cadmium	mg/kg	150	810	10
6	Copper	mg/kg	( w	-	100
7	Zinc	mg/kg			300
8	Chromium	mg/kg	250	640	
9	Fluoride	mg/kg	N#E	-	-
10	Boron	mg/kg	72		
11	Selenium	mg/kg	- 2	10,000	

Source: Japan: Ministry of Environment, Government of Japan (2002), "Regulation for Implementing the Law on Soil Contamination Countermeasures"

Thailand: Notification of National Environmental Board No.25, B.E. Thailand (2004), "other purpose" class"

Vietnam: QCVN 03:2008/BTNMT, Applied "industrial land', Vietnam.

### Summary of survey points

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



Figure 1 Location map of the soil sampling points



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

Table 2	Summary	of	survey	points
I dbic 2	Julilliary	O.	SUIVEY	Ponts

Sampling Point	Coordinates	Description of Sampling Point
S-1	16° 40' 13.49" N	About 40 m northeast of administration
	96° 16' 29.89" E	building.
S-2	16° 40' 10.74" N	At the embankment area of the drain, near
	96° 16' 22.01" E	main gate of Thilawa SEZ.
S-3	16° 40' 30.25" N	At the drain from sewage treatment plant.
	96° 16' 34.86" E	
S-4	16° 40' 24.29" N	At damping area near retention pond.
	96° 15' 49.55" E	59 30
S-5	16° 40' 32.36" N	At the drain from the retention pond.
	96° 15' 49.81" E	30

### S-1

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



Figure 2 Soil quality sampling at S-1

### 5-2

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





Figure 3 Soil quality sampling at S-2

### 5-3

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



Figure 4 Soil quality sampling at S-3

### 5-4

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





Figure 5 Soil quality sampling at S-4

### 5-5

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



Figure 6 Soil quality monitoring at S-5

### Survey Period

Soil sampling was carried out on 20th December 2018.

### Survey Method

For soil sampling, the standard environmental sampler (soil auger) was applied. The sampler is a stainless-steel tube that is sharpened on one end and fitted with a long, T-shaped handle. This tube is approximately three inches inside diameter. In order to refrain from contamination, about 20-30 cm of top soil was removed by the sampler before sampling. Then sample was taken and collected in cleaned plastic bag. Chemical preservation of soil is not generally recommended. Samples were cooled in an ice box which temperature was under 4°C. Samples were protected from sunlight to minimize any potential reaction.

Field equipment used on site are also shown in the table.

Table 3 Field Equipment for Sediment and Soil Quality Survey

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

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

Table 4 Analysis methods of soil quality

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

### Survey Result

Chemical properties for soil was analyzed in the laboratory of United Analyst and Engineering Consultant Co., Ltd. in Thailand.

The result of soil quality analysis is presented as follow. The results are complied with the proposed standard value of contamination.

Table 4 Soil quality result

No.	Parameter	Unit	S-1	S-2	S-3	S-4	S-5	Japan	Thailand	Vietnam
1	рН	-	5.5	5.4	7.8	7.0	7.3	-	-	-
2	Mercury	mg/kg	ND	ND	ND	0.342	ND	15	610	2
3	Arsenic	mg/kg	12.8	9.8	3.91	14.5	5.35	150	27	12
4	Lead	mg/kg	16.7	13.6	13.0	16.1	11.8	150	750	300
5	Cadmium	mg/kg	3.37	2.67	1.48	3.12	1.59	150	810	10
6	Copper	mg/kg	26.4	19.8	22.2	17.8	17.8			100
7	Zinc	mg/kg	34.6	29.0	51.3	31.4	40.2	-	-	300
8	Chromium	mg/kg	80.5	45.4	35.7	82.8	32.9	250	640	-
9	Fluoride	mg/kg	ND	ND	ND	ND	ND		-	. +
10	Boron	mg/kg	25.3	20.9	11.6	21.9	12.5	-	-	-
11	Selenium	mg/kg	0.764	0.231	ND	0.311	0.152	-	10,000	





### United Analyst and Engineering Consultant Co., Ltd.

3 Soi Udomsuk 41, Sukhumvit Road, Bangchak, Phrakhanong, Bangkok 10260

Tel. 0 2763 2828 Fax 0 2763 2800 www.uaeconsultant.com E-mail: uae@uaeconsultant.com

### ANALYSIS REPORT

**PROJECT NAME** 

: SOIL CONTAMINATION SURVEY IN THILAWA SEZ (ZONE A)

**CUSTOMER NAME** 

: REM-UAE LABORATORY AND CONSULTANT CO.,LTD.

**ADDRESS** 

: B-702 DELTA PLAZA, SHWEGONDAING ROAD BAHAN YANGON MYANMAR

**CONTACT INFORMATION** 

: TEL: +959799855808 e-mail: toetoehlaing@rem-uaeconsultant.com

SAMPLING SOURCE

: THILAWA

SAMPLE TYPE

: SOIL

RECEIVED DATE

: DECEMBER 21, 2018

SAMPLING DATE

: DEMCEMBER 20, 2018

ANALYTICAL DATE

: DECEMBER 21, 2018-JANUARY 7, 2019

SAMPLING TIME

: -

REPORT NO.

: 2019-U01697

SAMPLING METHOD SAMPLING BY

: -

WORK NO.

: 2018-008851

: CUSTOMER

ANALYSIS NO.

: T18A3004-0001

ANALYZED BY

: MISS CHOMTHANAN APHIPATPAPHA

			RESULT	DETECTION
PARAMETER	UNIT	METHOD OF ANALYSIS	S1 T18AJ004-0001	
pH (1:1)		ELECTROMETRIC METHOD (U.S. EPA 2004:9045 D)	5.5 (25°C)	
LUORIDE mg/kg		ION SELECTIVE ELECTRODE METHOD (U.S. EPA METHOD : 9214:1996)	ND	08.0
METALS				
MERCURY (Hg)	mg/kg	ACID DIGESTION AND COLD VAPOUR AAS METHOD (U.S.EPA 2007;7471B)	ND	0.100
BORON (B)	mg/kg ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)		25.3	0,250
ADMIUM (Cd) mg/kg		ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	3.37	0.050
CHROMIUM (Cr) mg/kg		ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	80.5	0.150
COPPER (Cu) mg/kg		ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	26.4	0.050



<sup>•</sup> REPORTED ANALYSIS REFERS TO SUBMITTED SAMPLE ONLY.





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			RESULT	DETECTION
PARAMETER	UNIT	METHOD OF ANALYSIS	S1 T18AJ004-0001	
LEAD (Pb)	mg/kg	ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	16.7	0.150
ZINC (Zn)	mg/kg	ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	34.6	0.150
ARSENIC (As)	mg/kg	ACID DIGESTION AND HYDRIDE GENERATION AAS METHOD (U.S.EPA 1996:3050 B AND 1992:7061 A)	12.8	0.100
SELENIUM (Se)	mg/kg	ACID DIGESTION AND HYDRIDE GENERATION AAS METHOD (U.S.EPA 1996:3050 B AND 1992:7061 A)	0.764	0.100
SAMPLE CONDITION			BROWN	SOIL

ND

: NON-DETECTABLE.

(MR BHUCHONK PANICHLERTUMPI)
TECHNICAL MANAGEMENT

(MRS PIYAPAT SUTTAMANUTWONG) LABORATORY SUPERVISOR

JANUARY 8, 2019

**JANUARY 8, 2019** 



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#### ANALYSIS REPORT

PROJECT NAME

: SOIL CONTAMINATION SURVEY IN THILAWA SEZ (ZONE A)

**CUSTOMER NAME** 

: REM-UAE LABORATORY AND CONSULTANT CO.,LTD.

**ADDRESS** 

: B-702 DELTA PLAZA, SHWEGONDAING ROAD BAHAN YANGON MYANMAR

CONTACT INFORMATION

: TEL: +959799855808 e-mail: toetoehlaing@rem-uaeconsultant.com

SAMPLING SOURCE

: THILAWA

SAMPLE TYPE

: SOIL

RECEIVED DATE

: DECEMBER 21, 2018

SAMPLING DATE

: DEMCEMBER 20, 2018

ANALYTICAL DATE

: DECEMBER 21, 2018-JANUARY 7, 2019

SAMPLING TIME

. .

REPORT NO. WORK NO. : 2019-U01699 : 2018-008851

SAMPLING METHOD SAMPLING BY : -: CUSTOMER

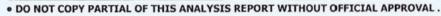
ANALYSIS NO.

: T18AJ004-0002

ANALYZED BY

: MISS CHOMTHANAN APHIPATPAPHA

PARAMETER	UNIT	METHOD OF ANALYSIS	S2 T18AJ004-0002	DETECTION	
pH (1:1)		ELECTROMETRIC METHOD (U.S. EPA 2004:9045 D)	5.4 (25°C)		
		ION SELECTIVE ELECTRODE METHOD (U.S. EPA METHOD : 9214:1996)	ND	0.80	
METALS					
MERCURY (Hg)	mg/kg	ACID DIGESTION AND COLD VAPOUR AAS METHOD (U.S.EPA 2007:7471B)	ND	0.100	
BORON (B) mg/kg		ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	20.9	0.250	
CADMIUM (Cd) mg/kg		ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	2.67	0.050	
CHROMIUM (Cr) m		ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	45.4	0.150	
COPPER (Cu)	mg/kg	ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	19.8	0.050	



<sup>•</sup> REPORTED ANALYSIS REFERS TO SUBMITTED SAMPLE ONLY.





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			RESULT	DETECTION
PARAMETER	UNIT	METHOD OF ANALYSIS	52 T18AJ004-0002	
LEAD (Pb)	mg/kg	ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	13.6	0.150
ZINC (Zn)	mg/kg	ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	29.0	0.150
ARSENIC (As)	mg/kg	ACID DIGESTION AND HYDRIDE GENERATION AAS METHOD (U.S.EPA 1996:3050 B AND 1992:7061 A)	9.81	0.100
SELENIUM (Se)	mg/kg	ACID DIGESTION AND HYDRIDE GENERATION AAS METHOD (U.S.EPA 1996:3050 B AND 1992:7061 A)	0.231	0.100
SAMPLE CONDITION	7		BROWN :	SOIL

ND

NON-DETECTABLE

(MR BHUCHONK PANICHLERTUMPI)
TECHNICAL MANAGEMENT

**JANUARY 8, 2019** 

(MRS PIYAPAT SUTTAMANUTWONG)
LABORATORY SUPERVISOR

**JANUARY 8, 2019** 

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#### ANALYSIS REPORT

PROJECT NAME

: SOIL CONTAMINATION SURVEY IN THILAWA SEZ (ZONE A)

**CUSTOMER NAME** 

: REM-UAE LABORATORY AND CONSULTANT CO.,LTD.

**ADDRESS** 

: B-702 DELTA PLAZA, SHWEGONDAING ROAD BAHAN YANGON MYANMAR

CONTACT INFORMATION

: TEL: +959799855808 e-mail: toetoehlaing@rem-uaeconsultant.com

SAMPLING SOURCE

: THILAWA

SAMPLE TYPE

: SOIL

: DEMCEMBER 20, 2018

RECEIVED DATE

: DECEMBER 21, 2018

SAMPLING DATE

ANALYTICAL DATE

: DECEMBER 21, 2018-JANUARY 7, 2019 : 2019-U01700

SAMPLING TIME SAMPLING METHOD 1 -1 - REPORT NO. WORK NO.

: 2018-008851

SAMPLING BY

: CUSTOMER

ANALYSIS NO.

: T18AJ004-0003

**ANALYZED BY** 

: MISS CHOMTHANAN APHIPATPAPHA

			RESULT		
PARAMETER	UNIT	METHOD OF ANALYSIS	S3 T18AJ004-0003	DETECTION	
pH (1:1)		ELECTROMETRIC METHOD (U.S. EPA 2004:9045 D)	7.8 (25°C)	-	
UORIDE mg/kg ION SELECTIVE ELECTRODE METHO METHOD: 9214:1996)		ION SELECTIVE ELECTRODE METHOD (U.S. EPA METHOD : 9214:1996)	ND	0.80	
METALS	.,,				
MERCURY (Hg)	mg/kg	ACID DIGESTION AND COLD VAPOUR AAS METHOD (U.S.EPA 2007:7471B)	ND	0.100	
BORON (B) mg/kg		ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	11.6	0.250	
CADMIUM (Cd) mg/kg		ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	1.48	0.050	
CHROMIUM (Cr)		ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	35.7	0.150	
COPPER (Cu)	mg/kg	ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	22.2	0.050	



<sup>•</sup> REPORTED ANALYSIS REFERS TO SUBMITTED SAMPLE ONLY.





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Tel. 0 2763 2828 Fax 0 2763 2800 www.uaeconsultant.com E-mail: uae@uaeconsultant.com

			RESULT	DETECTION
PARAMETER	UNIT	METHOD OF ANALYSIS	S3 T18AJ004-0003	
LEAD (Pb)	mg/kg	ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	13.0	0.150
ZINC (Zn)	mg/kg	ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	51.3	0.150
ARSENIC (As)	mg/kg	ACID DIGESTION AND HYDRIDE GENERATION AAS METHOD (U.S.EPA 1996:3050 B AND 1992:7061 A)	3.91	0.100
SELENIUM (Se)	mg/kg	ACID DIGESTION AND HYDRIDE GENERATION AAS METHOD (U.S.EPA 1996:3050 B AND 1992:7061 A)	ND	0.100
SAMPLE CONDITION			GREY SOIL	

ND

NON-DETECTABLE

(MR BHUCHONK PANICHLERTUMPI) TECHNICAL MANAGEMENT

JANUARY 8, 2019

(MRS PIYAPAT SUTTAMANUTWONG) LABORATORY SUPERVISOR

JANUARY 8, 2019

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2019-U01700



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#### **ANALYSIS REPORT**

PROJECT NAME

: SOIL CONTAMINATION SURVEY IN THILAWA SEZ (ZONE A)

**CUSTOMER NAME** 

: REM-UAE LABORATORY AND CONSULTANT CO.,LTD.

**ADDRESS** 

: B-702 DELTA PLAZA, SHWEGONDAING ROAD BAHAN YANGON MYANMAR

CONTACT INFORMATION

: TEL: +959799855808 e-mail: toetoehlaing@rem-uaeconsultant.com

SAMPLING SOURCE

: THILAWA

SAMPLE TYPE

: SOIL

: DEMCEMBER 20, 2018

RECEIVED DATE

: DECEMBER 21, 2018

SAMPLING DATE

ANALYTICAL DATE

: DECEMBER 21, 2018-JANUARY 7, 2019

SAMPLING TIME
SAMPLING METHOD

: -

REPORT NO. WORK NO. : 2019-U01701 : 2018-008851

SAMPLING BY

: CUSTOMER

ANALYSIS NO.

: T18AJ004-0004

ANALYZED BY

: MISS CHOMTHANAN APHIPATPAPHA

			RESULT		
PARAMETER	UNIT	METHOD OF ANALYSIS	S4 T18AJ004-0004	DETECTION	
pH (1:1)		ELECTROMETRIC METHOD (U.S. EPA 2004:9045 D)	7.0 (25°C)		
FLUORIDE	UORIDE mg/kg ION SELECTIVE ELECTRODE METHOD (U.S METHOD : 9214:1996)		ND	0.80	
METALS					
MERCURY (Hg)		ACID DIGESTION AND COLD VAPOUR AAS METHOD (U.S.EPA 2007:7471B)	0.342	0.100	
BORON (B) mg/kg		ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	219	0.250	
CADMIUM (Cd) mg/kg		ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	3.12	0.050	
CHROMIUM (Cr) mg/kg		ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	82.8	0.150	
COPPER (Cu)	mg/kg	ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	17.8	0.050	



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PARAMETER	UNIT	METHOD OF ANALYSIS	S4 T18AJ004-0004	DETECTION
PLASMA ( 2018:6010		ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	16.1	0.150
ZINC (Zn) mg/kg		ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	31.4	0.150
ARSENIC (As)	mg/kg	ACID DIGESTION AND HYDRIDE GENERATION AAS METHOD (U.S.EPA 1996:3050 B AND 1992:7061 A)	14.5	0.100
SELENIUM (Se)	mg/kg	ACID DIGESTION AND HYDRIDE GENERATION AAS METHOD (U.S.EPA 1996:3050 B AND 1992:7061 A)	0.311	0.100
SAMPLE CONDITION			BROWN :	SOIL

ND

: NON-DETECTABLE.

THILAWA DELIELO OMENT MR BHUCHONK PANICHLERTUMPI) TECHNICAL MANAGEMENT

**JANUARY 8, 2019** 

LABORATORY SUPERVISOR

**JANUARY 8, 2019** 

(MRS PIYAPAT SUTTAMANUTWONG)

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#### ANALYSIS REPORT

PROJECT NAME

: SOIL CONTAMINATION SURVEY IN THILAWA SEZ (ZONE A)

**CUSTOMER NAME** 

: REM-UAE LABORATORY AND CONSULTANT CO.,LTD.

ADDRESS

: B-702 DELTA PLAZA, SHWEGONDAING ROAD BAHAN YANGON MYANMAR

CONTACT INFORMATION

: TEL: +959799855808 e-mail: toetoehlaing@rem-uaeconsultant.com

SAMPLING SOURCE

: THILAWA

SAMPLE TYPE

: SOIL

, JOIL

RECEIVED DATE

: DECEMBER 21, 2018

SAMPLING DATE

: DEMCEMBER 20, 2018

ANALYTICAL DATE

: DECEMBER 21, 2018-JANUARY 7, 2019

SAMPLING TIME

. .

REPORT NO. WORK NO. : 2019-U01702 : 2018-008851

SAMPLING BY

SAMPLING METHOD

: CUSTOMER

ANALYSIS NO.

: T18AJ004-0005

ANALYZED BY

: MISS CHOMTHANAN APHIPATPAPHA

			RESULT	1	
PARAMETER	UNIT	METHOD OF ANALYSIS	S5 T18AJ004-0005	DETECTION	
pH (1:1)	17:	ELECTROMETRIC METHOD (U.S. EPA 2004.9045 D)	7.3 (25°C)		
		ION SELECTIVE ELECTRODE METHOD (U.S. EPA METHOD : 9214:1996)	ND	0.80	
METALS					
MERCURY (Hg)	mg/kg	ACID DIGESTION AND COLD VAPOUR AAS METHOD (U.S.EPA 2007:7471B)	ND	0.100	
BORON (B) mg/kg		ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	12.5	0.250	
CADMIUM (Cd) mg/kg		ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	1.59	0.050	
CHROMIUM (Cr)		ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	32.9	0.150	
COPPER (Cu)	mg/kg	ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:5010 D)	17.8	0.050	



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			RESULT	DETECTION
PARAMETER	UNIT	METHOD OF ANALYSIS	S5 T18AJ004-0005	
LEAD (Pb)	mg/kg	ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	11.8	0.150
ZINC (Zn)	mg/kg	ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (U.S.EPA 1996:3050 B AND 2018:6010 D)	40.2	0.150
ARSENIC (As)	mg/kg	ACID DIGESTION AND HYDRIDE GENERATION AAS METHOD (U.S.EPA 1996:3050 B AND 1992:7061 A)	5.35	0.100
SELENIUM (Se)	mg/kg	ACID DIGESTION AND HYDRIDE GENERATION AAS METHOD (U.S.EPA 1996:3050 B AND 1992:7061 A)	0.152	0.100
SAMPLE CONDITION			BROWN	SOIL

ND :

: NON-DETECTABLE.

(MR BHUCHONK PANICHLERTUMPI)
TECHNICAL MANAGEMENT

JANUARY 8, 2019

(MRS PIYAPAT SUTTAMANUTWONG)
LABORATORY SUPERVISOR

JANUARY 8, 2019

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## Thilawa Special Economic Zone (Zone A) **Development Project (Operation Phase)**

#### Appendix

**Finding Reason of Dead Fish** January, 2019





# FINDING REASON OF DEAD FISH IN INDUSTRIAL AREA OF THILAWA SPECIAL ECONOMIC ZONE-A

January 2019

Myanmar Japan Thilawa Development Ltd



#### MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED

#### Time and Place Occurred Dead Fish Case

First time dead fish case occurred in retention canal on 23th June 2018.

Second time dead fish case occurred in retention pond on 29th September 2018.

#### 2. Kind of Dead Fish

All of dead fishes were Ngabae Than in local name.

#### 3. Action Taken

- MJTD reported immediately once to Thilawa SEZ Management Committee (TSMC) on 25th June 2018 for first time and 1st October 2018 for second time.
- MJTD checked along the canal where dead fish occurred on 23th June 2018 for first time and 29th September 2018. During at that time, villagers near the Thilawa Special Economic Zone fishing by electric shock was also heard.
- Take off all of dead fish and analyzed the species of fish. All of dead fish are all the kind of Ngabae Than.
- 4. For detection of dead fish case, collect sample water where dead fish occurred and analyzed it. The parameters analyzed were pH, Oil and Grease, Mercury, Hexavalent Chromium, Ammonia, Cyanide, Free Chlorine and Phenol.
- Then reporting the results to TSMC after receiving the analyzed results on 4<sup>th</sup> July 2018 and 16<sup>th</sup> October 2018.
- After reporting to TSMC, MJTD continuous monitor and check around canal retention pond till now.





#### 4. Water Analysis Results

First time dead fish case, water analysis results are as follow:

No	Parameter	unit	Env-1	Env-2	Env-3	Env-4	Env-5	Env-6	Standard NEQG	Target Value of EIA
1	pH		6.68	7.22	7.25	7.22	7.42	7.03	6-9	6-9
2	Dissolved Oxygen	mg/L	3.73	4.11	4.16	4.19	4.63	4.11	-	-
3	Oil and Grease	mg/L	<3.1	<3.1	<3.1	<3.1	3.2	< 3.1	10	10
4	Mercury	mg/L	≤0.00054	≤0.00054	≤0.00054	≤0.00054	≤0.00054	≤0.00054	0.01	0.005
5	Ammonia	mg/L	0.204	0.221	0.181	0.163	0.174	0.112	10	10
6	Hexavalent Chromium	mg/L	< 0.05	< 0.05	<0.05	< 0.05	< 0.05	< 0.05	0.1	0.1
7	Cyanide	mg/L	0.003	0.007	0.002	0.005	0.004	< 0.002	1	0.2
8	Free Chlorine	mg/L	< 0.1	<0.1	<0.1	<0.1	<0.1	< 0.1	•	0.2
MOR JA	Phenols	mg/L	< 0.002	< 0.002	< 0.002	< 0.002	0.003	< 0.002	0.5	1

#### MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED

Second time dead fish case, water analysis results are as follow:

No	Parameter	unit	Env-1	Env-2	Env-3	Env-4	Env-5	Standard NEQG	Target Value of EIA
1	pH		6.98	7.23	7.95	8.35	7.27	6-9	6-9
2	Oil and Grease	mg/L	<3.1	<3.1	<3.1	<3.1	<3.1	10	10
3	Mercury	mg/L	≤0.002	≤0.002	≤0.002	≤0.002	≤0.002	0.01	0.005
4	Hexavalent Chromium	mg/L	< 0.05	< 0.05	< 0.05	<0.05	< 0.05	0.1	0.1
5	Cyanide	mg/L	< 0.002	<0.002	0.003	0.004	0.014	1	0.2
6	Free Chlorine	mg/L	0.1	<0.1	<0.1	<0.1	<0.1	320	0.2
7	Phenols	mg/L	< 0.002	< 0.002	<0.002	< 0.002	< 0.002	0.5	1

#### **Expected Reasons**

Reason for dead fish cause by high water temperature cause by climate, oxygen depletion, under water explosion, toxin, oil or hazardous waste, drought and overstocking and fishing. During dead fish case happen water temperature is between 24·29.8 °C and there is little hot. For depletion of oxygen, DO is in the range of 3.73·4.63 mg/L and it is enough for alive of fish. For detection of oily water, water is analyzed oil and grease and most of results are <3.1 and it could not be affected to fish. For detection of toxin and hazardous waste, we analyzed water mercury, hexavalent chromium, cyanide, phenol and free chlorine. All of these parameters are under target value and standard of NEQG. From the above results, it could be said water in retention canal and retention ponds are not toxin and hazardous. The time we investigate of dead fish we observed that fishing was done by electric shock and temperature is little hot. From analysis results and weather conditions, dead fish was happened by fishing and temperature changes.



### Thilawa Special Economic Zone (Zone A) **Development Project (Operation Phase)**

#### **Appendix**

**Ground Subsidence Monitoring Status** (Location- Admin Complex Compound) October 2018 to March 2019



#### **Ground Subsidence Monitoring Status (Operation Phase)**

Location

**Admin Complex Compound** 

**Coordinate Points** 

E=209545.508

N=1844669.443

Month	Date	Predefined Level (m)-ASL	Weekly Reading Level (m)-ASL	Subsidence (m)	Remark
	15-Jul-16	+7.137	+7.137	0.000	
Jul	22-Jul-16	+7.137	+7.136	-0.001	
	29-Jul-16	+7.137	+7.136	-0.001	
	5-Aug-16	+7.137	+7.136	-0.001	
	12-Aug-16	+7.137	+7.136	-0.001	
Aug	19-Aug-16	+7.137	+7.136	-0.001	
	26-Aug-16	+7.137	+7.136	-0.001	
-	2-Sep-16	+7.137	+7.136	-0.001	
	9-Sep-16	+7.137	+7.136	-0.001	
Sept	16-Sep-16	+7.137	+7.136	-0.001	
	23-Sep-16	+7.137	+7.136	-0.001	
	30-Sep-16	+7.137	+7.136	-0.001	
	7-Oct-16	+7.137	+7.136	-0.001	
	14-Oct-16	+7.137	+7.136	-0.001	
Oct	21-Oct-16	+7.137	+7.136	-0.001	
	28-Oct-16	+7.137	+7.136	-0.001	
	4-Nov-16	+7.137	+7.136	-0.001	
	11-Nov-16	+7.137	+7.136	-0.001	
Nov	18-Nov-16	+7.137	+7.136	-0.001	
	25-Nov-16	+7.137	+7.138	+0.001	
	2-Dec-16	+7.137	+7.136	-0.001	
	9-Dec-16	+7.137	+7.136	-0.001	
Dec	16-Dec-16	+7.137	+7.135	-0.002	
	23-Dec-16	+7.137	+7.133	-0.004	
	30-Dec-16	+7.137	+7.133	-0.004	
Jan	6-Jan-17	+7.137	+7.134	-0.003	
	13-Jan-17	+7.137	+7.134	-0.003	
	20-Jan-17	+7.137	+7.134	-0.003	
	27-Jan-17	+7.137	+7.134	-0.003	
	3-Feb-17	+7.137	+7.134	-0.003	
	10-Feb-17	+7.137	+7.134	-0.003	
Feb	17-Feb-17	+7.137	+7.134	-0.003	
	24-Feb-17	+7.137	+7.134	-0.003	
	3-Mar-17	+7.137	+7.134	-0.003	
i	10-Mar-17	+7.137	+7.134	-0.003	
Mar	17-Mar-17	+7.137	+7.128	-0.009	After earthquake
	24-Mar-17	+7.137	+7.128	-0.009	vincer curringsunc
	31-Mar-17	+7.137	+7.128	-0.009	
	7-Apr-17	+7.137	+7.128	-0.009	
Apr	21-Apr-17	+7.137	+7.126	-0.011	
	28-Apr-17	+7.137	+7.126	-0.011	
	5-May-17	+7.137	+7.126	-0.011	
	12-May-17	+7.137	+7.129	-0.008	
May	19-May-17	+7.137	+7.131	-0.006	
	26-May-17	+7.137	+7.135	-0.002	
	9-Jun-17	+7.137	+7.135	-0.002	
	16-Jun-17	+7.137	+7.134	-0.003	
Jun	23-Jun-17	+7.137	+7.134	-0.003	
1	30-Jun-17	+7.137	+7.136	-0.001	
	7-Jul-17	+7.137	+7.136	-0.001	
1	14-Jul-17	+7.137	+7.136	-0.001	
July	21-Jul-17	+7.137	+7.138	+0.001	
	28-Jul-17	+7.137	+7.136	-0.001	
	3-Aug-17	+7.137	+7.136	-0.001	
ŀ	10-Aug-17	+7.137	+7.137	+0.000	
Aug	17-Aug-17	+7.137	+7.136	-0.001	
	ar rive ar	* A + A - A - A	Tribud	0.001	

Month	Date	Predefined Level (m)-ASL	Weekly Reading Level (m)-ASL	Subsidence (m)	Remark
	1-Sep-17	+7.137	+7.136	-0.001	
	8-Sep-17	+7.137	+7.136	-0.001	
Sept	15-Sep-17	+7.137	+7.136	-0.001	
	22-Sep-17	+7.137	+7.136	-0.001	
	29-Sep-17	+7.137	+7.136	-0.001	
	2-Oct-17	+7.137	+7.136	-0.001	
	9-Oct-17	+7.137	+7.136	-0.001	
Oct	16-Oct-17	+7.137	+7.136	-0.001	
	23-Oct-17	+7.137	+7.136	-0.001	
	30-Oct-17	+7.137	+7.136	-0.001	
	6-Nov-17	+7.137	+7.136	-0.001	
Nov	13-Nov-17	+7.137	+7.136	-0.001	
1404	20-Nov-17	+7.137	+7.135	-0.002	
	27-Nov-17	+7.137	+7.135	-0.002	
	4-Dec-17	+7.137	+7.135	-0.002	
Dec	11-Dec-17	+7.137	+7.135	-0.002	
0.00	18-Dec-17	+7.137	+7.134	-0.003	
	26-Dec-17	+7.137	+7.134	-0.003	
	2-Jan-18	+7.137	+7.134	-0.003	
	8-Jan-18	+7.137	+7.133	-0.004	
Jan	15-Jan-18	+7.137	+7.133	-0.004	
	22-Jan-18	+7.137	+7.132	-0.005	
	29-Jan-18	+7.137	+7.132	-0.005	
	5-Feb-18	+7.137	+7.132	-0.005	
Feb	13-Feb-18	+7.137	+7.132	-0.005	
	19-Feb-18	+7.137	+7.132	-0.005	
	26-Feb-18	+7.137	+7.132	-0.005	
Mar	5-Mar-18	+7.137	+7.132	-0.005	
	12-Mar-18	+7.137	+7.132	-0.005	
	19-Mar-18	+7.137	+7.132	-0.005	
	26-Mar-18	+7.137	+7.130	-0.007	
	2-Apr-18	+7.137	+7.130	-0.007	
Apr	9-Apr-18	+7.137	+7.130	-0.007	
e-ipi	23-Apr-18	+7.137	+7.129	-0.008	
	30-Apr-18	+7.137	+7.129	-0.008	
	7-May-18	+7.137	+7.129	-0.008	
May	14-May-18	+7.137	+7.129	-0.008	
111111	21-May-18	+7.137	+7.13	-0.007	
	28-May-18	+7.137	+7.13	-0.007	
	4-Jun-18	+7.137	+7.13	-0.007	
June	11-Jun-18	+7.137	+7.131	-0.006	
and the	18-Jun-18	+7.137	+7.131	-0.006	
	25-Jun-18	+7.137	+7.132	-0.005	
	2-Jul-18	+7.137	+7.134	-0.003	
July	9-Jul-18	+7.137	+7.134	-0.003	
	16-Jul-18	+7.137	+7.134	-0.003	
-ug m	24-Jul-18	+7.137	+7.135	-0.002	
	3-Aug-18	+7.137	+7.135	-0.002	
August	13-Aug-18	+7.137	+7.135	-0.002	1004
- Anna	20-Aug-18	+7.137	+7.134	-0.003	
	27-Aug-18	+7.137	+7.135	-0.002	
	3-Sep-18	+7.137	+7.135	-0.002	
ptember	10-Sep-18	+7.137	+7.136	-0.001	
non/traffic	17-Sep-18	+7.137	+7.136	-0.001	
	28-Sep-18	+7.137	+7.136	-0.001	
	8-Oct-18	+7.137	+7.136	-0.001	
ctober	15-Oct-18	+7.137	+7.136	-0.001	
/	20 Oct-18	+7.137	+7.136	-0.001	
//8	NBI-Bergs	+7.137	+7.136	-0.001	
13/	9-Nov-180	+7.137	+7.136	-0.001	
ovember	46 Nov-18 m	+7.137	+7.136	-0.001	
Ne William	23-Nov-18 =	+7.137	+7.135	-0.002	

Month	Date	Predefined Level (m)-ASL	Weekly Reading Level (m)-ASL	Subsidence (m)	Remark
	3-Dec-18	+7.137	+7.135	-0.002	
December	13-Dec-18	+7.137	+7.135	-0.002	
December	20-Dec-18	+7.137	+7.135	-0.002	
	27-Dec-18	+7.137	+7.135	-0.002	
	8-Jan-19	+7.137	+7.135	-0.002	
January	19-Jan-19	+7.137	+7.135	-0.002	
	26-Jan-19	+7.137	+7.135	-0.002	
	1-Feb-19	+7.137	+7.135	-0.002	
February	8-Feb-19	+7.137	+7.134	-0.003	
reuruary	15-Feb-19	+7.137	+7.134	-0.003	
	23-Feb-19	+7.137	+7.135	-0.002	
	4-Mar-19	+7.137	+7.135	-0.002	
March	16-Mar-19	+7.137	+7.136	-0.001	
Watch	23-Mar-19	+7.137	+7.136	-0.001	
	30-Mar-19	+7.137	+7.136	-0.001	





# Thilawa Special Economic Zone (Zone A) Development Project (Operation Phase)

#### **Appendix**

General Waste Disposal Record

(Admin Complex Compound- October 2018 to March 2019)





#### **Waste Disposal Record**

Location

: Admin Complex Compound (Trash Room)

**Disposal Site** 

: Golden DOWA Eco-system Myanmar Co.,Ltd

Type of Waste

: Waste from common area of Thilawa SEZ and Admin complex compound

No	Year	Month	Date	Waste Disposal Time	Weight(Kg)	Total Weight/month	
1	2018	October	05-Oct-18	1	1100	2120	
2	2018	October	10-Oct-18	1	1020	2120	
3	2018	November	13-Nov-18	1	1220	2100	
4	2018	November	14-Nov-18	1	880	2100	
5	2018	December	19-Dec-18	1	1320	1320	
6	2019	January	16-Jan-19	1	1100	2300	
7	2019	January	28-Jan-19	1	1200	2300	
8	2019	February	20-Feb-19	1	1200		
9	2019	February	21-Feb-19	1	440	2820	
10	2019	February	21-Feb-19	1	1180		
11	2019	March	22-Mar-19	1	1060	2260	
12	2019	March	22-Mar-19	1	1200	2260	



/		M	anif	est	C-Sli	ip	*Transportation company to Waste Generato	
Date of is	suance	(Day N	donth, Y	5 Oct 20	IR		(Name&Sign)	
Numbe issuar			99	79 1810	0051	Issuer	Too las Conv	
Contractors			V	/aste generator	Transportat	ion company	Waste service company	
Company Name		MITH	loux	na Jopan Dovelopment Ital:	GEM		Cem	
Tel				ltd.				
		Kind			Name		Style of packing	
		n-Hazardous		General	Closte			
Waste	□Haz	Hazardous		Qua	intity(Unit)		Remark	
	□Oth	ers		1100	oleg			
Customer	code		0	001	Waste Profile code		AxxI	
T	race	4/01		PIC(Name&Si	gn)		Date of Completion	
ransporta	ion com	npany	(Name&	isign) 3K12890 Kyrrad Naroq	2 miles	(Day Month, Y	(car)	
Waste serv	ice com	pany	(Name&	(Sign)	)	(Oay Month, Y		
				Designed by GOLDEN W	70WA ECO-SYSTEM	MYANMAI	R CO., LTD.	
idoseona	9		.v.	No. of the Control of			A A Section 1	
And the second section of the second		-	-	The last of the la				

	N	Manifest	C-S	lip	*Transportation company to Waste Generator	
Date of issu	ance (Day	Month, Year)	िरि	T	(Name&Sign)	
· Number of issuance		9999 1810	0097	Issuer	.5.	
Contracto	rs	Waste generator		ation company	Waste service company	
Company Na	ame M	grinmon Japon Ti Andopmens Itd	hilaun G	EM	GEM	
	Kine		Name		Style of packing	
I	Mon-Haz	GENORA	& Waste		ni di	
Waste	Hazardo		Quantity(Unit)		Remark	
ī	Others	1080	tg .			
Customer co		OOO \ Waste Profi		ile code		
Trac	e	PIC(Name&	&Sign)	Date of Completion		
ransportation	company	11 J 34 41	11-9-	(Day Month, Y	ear)	
Vaste service company		(Name&Sign)  KhasiN		(Day Month, Y	(MJTD)	

		Mani	fest	C-SI	in *	Transportation company to Waste Generator	
Date of is	suance	(Day Month, 1				Name&Sign)	
Numbe issuan	W W W	9999 1811 0114		14	Issuer	The second secon	
Contrac	tors	,	Waste generator	Transportat	ion company	Waste service company	
Company	Name	0.350	or Japan Ocusloporal	(n E 1	N	6 E M	
Tel		110			VALUE OF THE COLUMN		
				Name		Style of packing	
ZIN	No	ı-Hazardous	Connex	al what	2		
Waste	□Haz	ardous	Qu	antity(Unit)		Remark	
	□Oth	ers	. 12301	ig		Bring lime Buder	
Customer	code		1001	Waste Profil	e code	A00 I	
Tr	ace		PIC(Name&S	ign)		Date of Completion	
Fransportation com			Sax	4145	(Day Month, Year	e)	
Waste service com		(Name	&Sign)	2	(Dhy Mònth, Yest		
			Designed by GOLDEN I	DOWA ECO-SYSTEM	MYANMAR C	O., LTD.	

( ) ( ) ( ) ( ) ( ) ( )

		Mani	fest	C-SI	lip	*Transportation company to Waste Generator
Date of	issuance	(Day Month,	Year)		<del>-</del>	(Name&Sign)
Numb issua		181 PPP		70-11-0	Issuer	
Contra	ctors	7	Vaste generator		ion company	
Company	Name	Myma	rd Japan			service company
Tel		Thirecr	Thikeen Dulepowert		EM	GEM
16		Kind				
		-Hazardous		lame //:		Style of packing
Waste	□Haza	ardous	Quantity(Unit)			Remark
	Othe	rs	880 L	9		Rettalk
Customer	code	(	101	Waste Profile	code	Λ
Tr	ace		PIC(Name&Sign			Aco 1
ansportation comp		(Name&S	3K) 9145	isonfi (I	Day Month, Year	Date of Completion
		(Name&S	lyan Naing Co		ay Month, Year	The state of the s
aste servic	aste service compa		())			

		Manif	est	C-	Slip	CENT-SL-R 010E /00
Date of is	suance	(Day Month, Yo	Dec 2018			Name&Sign)
Numbe issuar		9999	1812 0	168	Issuer	1,271
Contrac	ctors	The second secon	aste generator	Transpo	ortation company	Waste service company
Company	Company Name		r Inpan Revelopment	1	GEM	GEM
Tel			1-6			
13.11				Name		Style of packing
14	No	n-Hazardous	Gen	eval 1	vaste	
Waste	□Ha:	zardous	Quantity(Unit)			Remark
	Oth	ers	13201	19		
Customer	code	00	01	" Waste Profile code		A 00 1
T	race		PIC(Name&S	Sign)		Date of Completion
Transporta	tion con		Ny 1184 0.34-8	5896	(Day Month, Year	,
Waste serv	ice com	pany (Name&	Designed by GOLDEN	lang.	(Day Month, Yen	



		Manife	Manifest		Slip	*Transportation company to Waste General GEM - SL - R 010E /00
Date of is	suance	(Day Month, Ye		२०११	Issuer	(Name&Sign)
Numbe issuan	17,750.00	99	9999 1901		Issuer	·8-
Contractors		W	aste generator	Transport	ation company	Waste service company
Company Name		Myonmo Thilowa	. 1 (5)		GEN	n GEM.
Tel			Ltd.			
	Teles.	Kind		Name	1	Style of packing
	ZINOI	-Hazardous	Chener	al who	tc	
Waste	□Haz	ardous	Qua	ntity(Unit)		Remark
	□Oth	ers	110010	1		
Customer	code	(	300 1	Waste Prof	ñle code	A 00 1
Tr	ace		PIC(Name&Sig	gn)	1	Date of Completion
'ransportat	ion com	0 5	Nyi Ira e-3 km	5 E 10	(Day Month, Y	(ear)
Waste servi	ice com	(Name&)	Sign)		(Day Month, Y	(cir)

	4.503.0	Manife	st	C-Sli	p	*Transportation company to Waste Generator GEM - SL - R 010E /00	
Date of issu	ance	Day Month, Yea 28	Jan 20	19	Issuer	(Name&Sign)	
Number o		999	19 1901 (	pez7		Waste service company	
Contractors			ste generator	Transportati	on company	Wadte der 1-3	
Mukron Mukron		Mycrono	y Japan Thib	cux.	o EN	GEM	
Tel	No.es	Kind		Name		Style of packing	
		n-Hazardous zardous hers	General Propher	uantity(Unit)	<u> </u>	Remark	
Customer	code		0001	Waste Profile code		4001	
A TONIC POR CONTRACTOR	73		PIC(Name&	Sign)		Date of Completion	
Transporta		(Name	RSign) RSign) RSign) RSign)	Sou	(Day Month	ZERLNA DE VELOS	
Waste serv	vice co	ompany (O)	Designed by GOLDE	0	MYANM	AR CO., LTD.	

		Mani		C-S	lip		ation company to Waste Generator SL - R 010E /00
Date of is	rof	(Day Month,	71 Feb 20 7999 1902	Issuer		(Name&Sigr	
Contrac	Contractors		Waste generator	ALTHOUGH IN A DISEASON PROPERTY.	tion company		Waste service company
Company	Name	Myona	nor Inpor		E M		GEM.
Tel		Spinowing.	134				
194	\$5400 ATT.	Kind -Hazardous	SC 48 YV 1 170 THESE	Name			Style of packing
			Cheneral	work			
Waste	□Haz	ardous	Quar	atity(Unit)			Remark
ėą:	Othe	žīs	440 kg				
Customer	code		οσοι ·	Waste Profi	le code	ria sama	A001
Tr	ace		PIC(Name&Sig	gn)	New Comments	The second second	of Completion
Transportati	28 2 W C. S. S.	pany Ca	w Navy Idin / 3K18896 /	)-;	(Day Month, Y	ear)	
Waste servi	ce comp	oany C	Phy Phyu	Aug.	(Day Month, Y	car).	
200			Designed by GOLDEN WO		M MYANMAR	CO., LTD.	

to A complete to	halita Shirana	an in placement of a		200 at 200 s	and the state of t		
	Manii		C-SI	ip .	*Transportation company to Waste Generator GEM - SL - R 010E /00		
Date of issuance	The second of the second	(Day Month, Year)		Issuer	(Name&Sign)		
Number of issuance		1902	0200	Issuci	1 / 5 / 5		
Contractors	1	Vaste generator	Transportat	ion compan	y Waste service company		
Company Name		n Duelopment L'Ocielopment	<b>ር</b> ነ	E M	GEM		
Tel	200	. 119	To Sanda Julian Cala		1 2 3 4 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5		
4.4	Kind	A CONTRACTOR OF THE CONTRACTOR	Name		Style of packing		
ZN	on Hazardous	Cicneral.	cosle				
Waste, □H	azardous	Qua	nntity(Unit)	1.00	Remark		
DO	hore	1180 kg					
Customer code		0001	Waste Profil	le code	1001		
Trace		PIC(Name&Si	gn)		Date of Completion		
Transportation co		ssion) 3ki8896 Kyouv Noine		(Day Month,	Year)		
Waste service co	mpany	There Phys	Aye	(Day Montik	Year)		
		Designed by GOLDEN W		MYANMA	R CO., LTD.		

	essan yen	Manif	est	C-SI	ip .	Transportation Sompan Ko Waste Googlator
Date of is	suance	Day Month, Y	ear)	216.		Name&Sign)
Numbe	71.77	T		CIGA	Issuer	1C
Contrac	tors		Vaste generator		tion company	Waste service company
Company	Name	100	nor kpon	61	E m	a Era
Tel		115	Ltd.			
		Kind		Name		Style of packing
	7Non-	Hazardous	CIENCIA	.l. (chsla	S	
Waste	□Haza	rdous	Quar	ntity(Unit)		Remark
	Othe	rs	1201 69			
Customer	code		0001	Waste Profil	le code	Acol
Tr	race		PIC(Name&Sig	gn)		Date of Completion
Transportat	ion comp	oany Zoo	ksign) , slove their 1×1×11		(Day Month, Year	0
Waste servi	ice comp	any (Name 8			(Day Month, Year	

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		Manit		C-Si	110	ransportation company to Waste Generato
Date of is	suance	(Day Month, Y	(car)	Ols	(Na	ame&Sign)
Numbe issuar		77	1703	()217	Issuer	T
Contrac	tors	V	Vaste generator	Transporta	tion company	Waste service company
Company		Myan Thilas	0 1	d GE	m	GEM
Tel	-		10			
		Kind		Name		Style of packing
72247 07		-Hazardous	General	a alleste	2	
Waste	□Haz	ardous	Qua	ntity(Unit)		Remark
	Othe	ers	.1060 kg			
Customer		0	001	Waste Profi	le code	A001
Tr	ace		PIC(Name&Si	gn)		Date of Completion
ransportat	ion com	pany f		74.7	(Day Month, Year)	
Vaste servi	ce comp	oany (Name&	Chen Cher	Nuc	(Day Monto, Year)	
			Designed by GOLDEN W		MYANMAR CO.	, LTD.

		Manif	est	C-S		ransportation company to Waste Generato GEM - SL - R 010E /00
Date of iss	suance	(Day Month, Yo	2 May 20	19		ime&Sign)
Numbe issuan		q	199 1903		Issuer	
Contrac	tors	N	aste generator	Transporta	tion company	Waste service company
Company	Hame		m Typen Dictorment	6	EM	6 EM
Tel			,			
		Kind		Name		Style of packing
	⊠Non	-Hazardous	General 1	ico-ste		
Waste	□Haz	ardous	Qua	ntity(Unit)		Remark
	Oth	ers	1200 kg			
Customer	code		0001	Waste Prof	ile code	A00 1
Tr	ace		PIC(Name&Sig	gn)		Date of Completion
ransportat	6	(Name &	10 min 3KI	8396	(Day Month, Year)  (Day Month, Year)	
Vaste serv	ice com	pany :	Phys Phys Designed by GOLDEN W			

ADEVE



# Thilawa Special Economic Zone (Zone A) Development Project (Operation Phase)

#### Appendix

Sewage Treatment Plant Monitoring Record
October 2018 to March 2019



Monitoring Parameters Result for STP(Phase-1) Cyanide Chromium Arsenic Mercury Cadmium Seienium Lead Color Odor Zinc Copper Barium Nickel Sulphide Free Chlorine dehyde Silver Iron Ammonia Chromium (Cree) Fluoride Chlorine Monthly Parameters ORP DO

	- mv 38 204.6 68 172.0	10.58		200 371	10	0.1 9.4	20 35	29.87 30.39	ppm	MFN/1008	ppm	ppm	Ppm	ррм	bbw	ppm	ppm	Ppm	рри	Irpin	ppm	COPT	COPT	Ppm	Ppm	ppm	Irpm	J.pim.	)-pm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	1
1-18 7	22 226.3 53 192.1	0.37	584 595	202 297	12	2.2	7	30.30		On 3 Oct 2018	didn't collect w	ter sampling s	ince tank clenir	ng .																								
-18 7	7.6 105.6 7.6 401.6	8.83	762	381	8	0.0	25 30	30.21 30.29					The country of									100														()		
ot-18 7	7.4 151 3 7.53 217	8.43 0.37	884 793	342	21	5.2	30	20.87		Name of Street, or other Persons and Street,																										and the same		
ct-18 7	7.59 187.5 7.60 180.5 7.7 186.1	8.74	715	292 354 298	12	7.7 2.2 4.2	10.3 10 31	30.3 30.54 30.34	7.17	>160000	6	0.95	<3.1	12																								1
1-18 7	7.63 222.3 7.77 203.5	7.05	014	207	10	0.1	42	30.58			10					-						-		-						- AC								
ct-18 7	7.01 289.3	13.13	1053	388 527	12	2.7	47	30.41 30.06																													T, IDS	
ct-18 7	7.64 256.8 7.24 227.1	12.86	595	297	7	7.5	48	30.55 30.85		>160000	14	0.7	43.1	12																								#
ct-18 Z	7.48 193.1 7.48 242.8 7.50 201.1	10.65	606	303		5.3	19	30.68 30.41 30.5													1000												100.00					
ct-18 7	7.53 198.5	11.21	674	302	4	4.0	13	29.95 29.93	8.6			0.657	41	16	<0.002	0.02	18 01	10 002	10 002	10.01	0.01	2.76	1.4	0.032	s0.002	0.034	0.018	0.000	40.1	0.152	10.002	2.612	7.2	<0.05	0.921			
10-18 7	(88 212.5 (81 192.4	13.94	409	205	51	3.1		29.55																														1
1-18 6	7,49 202.3 3.69 273.6 7,36 225.9	13.66	724	362	3.	0.1	24	29.41 29.76 29.01																														4
ct-18 7	e2 100.0 7.57 201.6	12.78	709	364	1	3.5	28	29.81			2																									-0-0		-
ct-18 7	75 180.1 754 205.6	12.75	650	325 307	50	0.4	14 33	30.22 30.37	9.46	>160000	6	0.607	Q1	28																								1
onta 7	7.81 177.6 7.52 165.9 7.50 163.9	12.67	600	279	1:	0.5 4.7 9.6	49 27	29.98 29.87 30.52										The same																				
ov-16 7	760 164 1 785 166 6	11.78	574	287		52	67	30.13			10000																											+
ov-18 7 ov-18 7	7.81 184.2 7,43 221.8	12.58	875 476	438 238		7.5	57	30.28 30.2	12.28	>160000	13	0.511	43.1	36	0.002	€.002	≠01	\$ 002	€ 002	10.01	10.002	3.85	1.4	≤0.002	\$0.002	0.02	0.022	0.011	0.3	0.124	±0.002	2.15	10.9	40.05	3.209			
2V-18 7	1.02 159.6 7.78 159.6	10.77	570	266	1.	2.1	37 26.5	29.76 30.45 30.32								E1C	-			THE R. P. LEWIS CO., LANSING, MICH.									de la constante de la constant	ling in								
with 7	7.01 173 7.71 168 7.71 156.0	0.48	050	325	5	10	70	30.67 20.82																						ALCO MANAGEMENT								-
ov-18 7 ov-18 7	7.03 100.0	10.01	508	254 412	1	7.1	47 24	30.04 30.53	12.17	<160000	13.2	1.07	<3.1	24																								
ov-16 7	7.75 171.2 7.04 104.5 7.72 197	12.3	741	371	1	0.5	32 52	30.3 30.17 30.74																		-												
ov-18 7	7.65 101.5 7.70 182	11.75	626	313		2.2	41	30.27		>160000	13.5	0.504	<3.1	22																					Market Services			-
v-18 7	7.87 101.6	11.41	694	347	S Shirt	1.8	41 30	30.24 30.33 30.04												1000																		775
ov-18 7	7.87 170.5	11.30	629	317	3	10	72	20.01										1					3001				300											#
ov-18 7	7.47 217.1 7.73 182.1 7.32 100	9.50	564	301 282 444	1	8.3	36	20.01 30.55 20.08																							- 10						and the same of	#
ov-18 7	7.61 175.4 7.75 157.0	13.1	055	328	2	7.8	48 44	30.17 30.16		>180000	15.3	1:38	<3.1	24																								1
ov-18 7	7.63 113.3 87.9	12.10	637	310	1	8.7 17.2	73 35	30 03 29 98		- Carrows																												
	7 04 73.0 7.03 73.3 8.10 118.0	11.02	564	292		0.7 12.1	68	29.98 30.17 29.45																							THE RESERVE							1
ec-18 7	7.76 60.4	8.37	513	257		27	54 86	30 28 30 08		>160000	18.5	0.958	-di	10	<0.002	50.002	10.01	10.002	10.007	50.01	50 002	5.11	2	0.048	0.002	0.024	0.014	40.005	<0.1	0.189	50.002	2.32	14.4	+0.05	4.326			+
ec-18 7 ec-18 7	7.74 298.2 7.82 98	12.52	1260	351	2	1.1	49 40	29.31 30.26																														
ec-18 6	7,71 156 134 110,3 7,87 211,3	11.20	000	400		0.1 0.1 2.6	51	30.4 30.19 29.28																														#
ec-18 6	6.56 36.1 7.68 245.6	11.64	782 026 531	413	7	7.8	38	29.28 30.45	16.75	>160000	9.7	0.783	<3.1	14																								+
ec-18 7	9.07 185.2 7.88 344.2	11.22	547	273		1.3	23 56	30.57 29.25																														1
10-18	#.1 150; 7.7 301	12.95	5 580 580 580 580 530 542 480 521	261	OF REAL PROPERTY.	14		30,01																			1111											1
ec-18 7	7.94 89.9 7.94 247 7.86 178.4	12.4 11.26 9.51 10.68 11.33	530	298 293 295 271	-	7.5 8.5 9.8 7.7	43 42 52 17	29.81 29.77 29.34	14.0	>160000	16.8	1.5	<31	te																								#
ec-18 7 ec-18 7	7.71 155.0 7.87 243.1	11.33	480 521	245 261	7	7.8	17 43	30.32																														1
ec-18 8	A 25 151 2 7 35 249 5	10.22	438	330	1	7.4		30.49																					-									+
ec-18 7 ec-18 7 ec-18 7	7.35 249 5 7.64 195 6 7.65 195.2 7.67 213.2	8.15 0.82 5 10.2 11.7 12.33	671 438 538 638 407 538 538	245 201 330 210 209 325 203 243 328 334 201 243	-	8.6 9.8 5.8	15	29.67 29.75 28.48		>180000	20.1	1.25	<31	12				- Fars	No.					Triangle of the			- 10									Under		-
no-18 7	7.62 185.5	12.33	538	243 325		9.8 5.8 6.9 6.9	24 39 34	29.32 29.18			77.10			A75-1																								
ec-18 7	7.74 194.1 7.6 222.1	12.14	401	334 201		8.2		29.61																														+
m-19 7	7.38 217. 7.87 214 8.02 200	12.37	507	243 253 278		2	20	29.17 29.12 28.99 28.78	21.4	>160000	12.8	1.21	<31	10	<0.002	-0.002	:0.01	<b>6</b> 002	40 002	Ø.01	≠ 002	4.33	1.4	0.014	<b>6</b> 002	0.022	0.01	0.014	×0.1	0.037	<b>6</b> 802	2.804	11.3	<0.05	0.429	<0.1		
	8.02 200 I 7.57 284 I 7.66 270 I	12.42 12.17 13.29 12.43	507 2 455 7 467 8 458 3 369 7 488 5 417	253 228 224 235	1	11.1	36	28.89	-																													
an-19 7 an-19 7	7 en 17m1	13,17	369 488	164 245	1	12.3 (5.1 8.0		27.54 29.27																														
in-19 7	7.89 165. 8.03 178. 7.98 124.	13.26	417	209 194 211		2.6	35 21	29.23 28.32 29.34		>160000	12.7	0.583	<3.1	24																								+
in-19 7 in-19 8 in-19 7	7.00 124.3 8.13 110.4 7.82 54.3	11.29	504	251 289	1	0.6 7.5 9.1	60	29.87 29.86		- 100000	187	7.565	761	-																								1
n-19 7	7.68 114: 7.52 175:	12.40	423 4 423 504 5 578 6 568 4 523 7 508 4 623 7 508 6 601 6 601	289 282 241 310 254 214 259 321	1 100	6.7 7.6 7.7		29.33		1000																									-			1
an-19 8	8.91 1101	11.84	7 508	310 254		4.7	41 27 28 28 28 60	29.17		>160000	12.6	1.25		12																								+
an-19 8	7.7 163 7.87 66 8.06 103	10.4	558	259 321		5.2 7.9 5.4	28 60	29.24 29.14 28.70		>100000	12.8	1.25	<0.1	14																								1
an-10 7	7.80 178.0 7.55 100.	10.74	620	301 254 309	-	5.5	Euro I	29.25 29.34																											,	MANAE	EVE	1
un-19 7	7.96 91.7 8.01 128.	10.41	637	309 318	4	5.5 4.6	70 33	29.01					-																						11 -1	200		F
an-19 7 an-19 3	7 96 144 1 7 44 165 1	12.44	700	284 349		6.5 3.2 6.5	25 54 75	29.1 29.17 29.63		>160000	17.3	1.1	-31	0																					13	(MJ?	D	+
an-10 8 an-10 7 an-10 7 an-10 7 an-10 8	7.44 165 7.80 170 7.65 188 8.58 210 7.78 104	12.44 3 6 1 13.06 0 12.65 2 10.06	637 560 700 102 5 658 5 707 575	349 3 513 330 300 300		6.B		28.76 29.01			No.																								10	3	1	-
art-19 7	7.78 104	8.27	575	360		5.6	31	29.14				1																							V	BANKIN +	(0)	

						-																Inlet					- 17.00		milia	77011	III SCHIE									
Month D	ate	pH	ORP	DO	EC	TDS	Turbidity	con	т	emp	800	T-Coll	T-N	T-P	OAG	55	Cyanide	Chromium	Arsenic	Mercury	Cadmium	Selenium	Lead	Color	Odor	Zinc	Copper	Barium	Nickel	Sulphide	Free Chlorine	Formal- de hyde	Silver	Iron	Ammonia	Hexavalent Chromium (Cr8+)	Fluoride	Total Chlorine	Total Cyanide	Phenois
			- Table		Daity Pa	arameters							Weekly P	arameters														Mor	thly Paramet	ers						(CIST)				
Standa	d	0.0			III-IIIAS III	Max 2,000		Max 4		(35/C	Max 200	in is a	Max 50	Maxit	Max 40	Max 200	Max 0.1	Man D.S.	Max 9.1	Max 0,008	Max 0.03	Max 0.02	Max 0.1	150	160	Max 2	Max 0.5	Max 1	Max 0.2	Max 1	Mior 4	Max 4	Max0,5	Max3.5	Max80	Max0,1		Max0.2		Max 0.6
Jan 29-		8.30	mv 121.6	mg/L 12.24	µs/cm		4,1		26	8.95	ppm	MPN/100ml	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	Co-Pt	Co-Pt	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Jan 30	Jan-10	8.27	240.8	0.37	534 877	267 442 270	10.3	40 109 51	20	0.17	17.06	>160000	17.8	1.31	<3.1	0																	7 To 1							
Jan 31 Feb 01-F		7.00	290 1	11.7	541 705	353	4.5		20	0.42										la	to an analysis										- Comment									
Feb 02-6	Feb-19	7.01	190.1	10.80	80	400	8.1		20	0.12						UP I							7 70					III VIDEO											STILL III	
	eb-19 Feb-19	7.50	286	10.47	203 656	378 328	7.5	66	20	B 15																	-												111111111111111111111111111111111111111	
Feb 05-8	Feb-19	7.68 7.82	335.8 230.0	10.61	878 623	930 428	11.7 7.2			0.17		Start t	ank cleanin	and mainte	nance																									
	Feb-19	8.05	160.4	9.47	831	408	4.7		20	9.36		Promot	1	1								0		N									-							
Feb 08-1	Feb-19	7.80	170.7	8.74	750 905	375 455	4.1		27	7.36	-		- X		CHARLES AND ADDRESS OF THE PARTY OF THE PART																	2-1-1111								-
Feb 10-1	Feb-10	7.01	120.8	11.70	1070	593	0.2		2	29.1			i i i i i i i i i i i i i i i i i i i	B 100 10						NIII III III							100												0	
	Feb-19	7.83	177	9.01 9.80	1124	327	5.2 4.5			9.02		AND THE REAL PROPERTY.	THE REAL PROPERTY.	CONTRACTOR OF THE PARTY OF THE		-	Det I	2000110					Service .		100				111 3			No.	1100	Cultural			W. C.		THE CONTINUE	
Feb 13-	Feb-19	7.0	177.5	10.31	952 716	477	5.8		29	9.11		Tan	k Cleaning a	ind Mainten	nce																	(A = = = 0.01)								
	Feb-19	7.10 6.96	45.3 42.9	4.22 2.63	075	410 338	20.2 15.0			0.70																	2000						4							
	Feb-19	6.77	34.6	2.09	448	224	17			9.63	0									110										District										
	Feb-19 Feb-19	6.77	26.3	0	771	397	15.0		28	8.47				-																		100000							-	
Feb 19-1	Feb-19	0.60	18.1	2.29	700 574 487	298 244	19.1		25	9.72 9.34		Tan	k Cleaning	and Maintena	ance																									
Feb 21-	Feb-19	6.61	7.3	0.39	716	360	23 20.9		29	9.33																														
	Feb-10 Feb-10	7.08	110.7	1.91	834 1165	417 581	11.0	-		9.73	-	-				-					Acres de la constante de la co	-					Lanta Barre		311											
Feb 24-	Feb-19	0.7	0.00	0.41	353	170	14.3		30	0.01																														
	Feb-19	7.08	7.9 82.5	2.1	834 790	244 317	15.3			9.65																														
Feb 27-8	Feb-19	6.97	63.5	4.81	843 552	422 275	5.00		3	30.2 29.6		Tan	k Cleaning a	nd Mainten	nnce																									
	Feb-19 Mar-19	6.76		1.28	555	244	11.0		20	9.85																											_			
	Mar-19	7.41	01.3 50.0	2.10 2.20	497 386	321 248	10.2		28	0.34																														-
Mar D4-	Mar-19	6.72	43.7	1.05	717	358	9.6		- 26	0.30																														
Mar 05-	Mar-19 Mar-19	8.00	02.5	1.28	593 994	295 497	10.7			9.61		Tan	k Cleaning	and Mainten	ance				_								1	_												
Mar 07-	Mar-19	0.0	-35.9	0	000	333	9.7	1936	30	10,08																														
Mar 08-	Mar-10 Mar-19	8.91	50.5	1.02	790 667	395 492	7,0 9.6 1.1		30	io.26	-						II-II-			100						-			West State	and the same	Name of Street									
Mar 10-	Mar-19	7.04	20.1	1.82	000	342	7.4			0.00		11				-5-				-																				
Mar 11- Mar 12-	Mar-19 Mar-19	7.38 6.66	34.5 159.8	1.54	568 625	392	22.2		2	8.26 29.6																														
	Mar-10 Mar-10	7.3	29.0	2.7	610	432 418	10.4			8.26 9.19		Tan	k Cleaning	and Mainten	ance																									
Mar 15-	Mar-19	6.64	184.5	0.06	795	998	7.8		- 30	0.27																														
	Mar-19 Mar-19	0.68	121.4	0.91	1614 673	706 468	7.8			10,82 10,26	-										C He																			
Mar 18-	Mar-19	7.22	29.4	1.72	725 731	512	6.7		30	0.42																														
Mar 20-	Mar-10 Mar-10	6.75 8.68	121.6	2.15	3-914	450	7.6			0.45 0.55		Fan	I Cleaning	and Mainten	ance							100000																	- Unit	
Mar 21-	Mar-19	0.06	107.1	0.28	729	369	5.4	1 1 1 1 1	30	0.01 0.57																														
Mar 21- Mar 22- Mar 23-	Mar-10	7.3	52.5 -112.5	0.17	903 1028	515	0.0		30	0.02														The same							H							TV		
Mar 24-	Mar-10	6.78 7.11	102.6	1.22	915	442 018	0.0			X0.24 X0.98																				U-11-6			1000							-
Mar 26-	Mar-10 Mar-19	7.15	62.5	1.99	1230	7.12	18.0		30	35.73		Tan	k Cleaning	and Mainten	ance																									
Mar 27-	Mar-19 Mar-19	7.10	67.5	3.6	1260	342 629	7.5			9.34													-							VIST S	PART									
Mar 29-	Mar-19	6.75	71.2	3.44	870	440	37.0	C GOLD	30	90.00																														
Mar 30-	Mar-10	7.31	94.5	3.35	1179	500 645	3.9 217		25	9.9e 90.34	-											011													1000					



Monitoring P	rameter	s Result	for STP(P	hase-1)							N. J. S.				THE ST			-		Outlet			lib.	0=00	_	-17/11/06					VALUE -	-						
Month Date	pH	ORP	DO	EC	TDS	Turbidity	COD	Temp	800	T-Cell	T-N	T.P	OEG	88	Cyanide	Chromium	Arsenic	Mercury	Cadmium	Selenium	Lead	Color	Odor	Zinc	Copper	Barium	Nickel	Sulphide	Free Chlorine	Formal- dehyde	Silver	Iron	Ammonia	Hexavalent Chromium(Cr6+)	Fluoride	Total Chlorine	Total Cyanide	Phenois
Standard				Daily	Parameters Max 2,000	The State of the S	MACTE	- Macon	Max 30	Max 400	110000000000000000000000000000000000000	arameters	War 16	Max 50	Has 0.1	Max 0.5	MAXONS	Max 0.008	Mac 0.03	MAX 0.02	Maror	MAX 150	Max 150	May 2	Max 0.5	147	Max 0.3	CONTRACTOR	Mart	Marc 4	Maco.s	Hax3.5	Harton.	Marri 9	Max 20	Max0.7	Max	Max 0.6
Oct 01-Oct-18 Oct 02-Oct-18	7.41	230.8	13.01	740	ppm 330 373	9.5 3.7	9pm 0.5 0.1	30,24	ppm	MNP/100m	) ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm			ppm	ppm	ppm	ppm	ppm	ppen	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Oct 03-Oct-18 Oct 04-Oct-18 Oct 05-Oct-18	7.26 7.30	238.7 220.4 230.2	17.87 13.74 15.21	730 764 768	389 382 384	1.7	4.2	29.93 30.07		Ori 3 Orti 2018	didn't collect w	ater sampling	since tank cler	ning																								
Oct 06-Oct-18 Oct 07-Oct-18 Oct 08-Oct-19	7.61	160.3	16.32 14.25 12.92	763 731 775	382 366 360	14.1	9.7	30.47 30.39 30.18											-																			
Oct 09-Oct-18 Oct 10-Oct-18 Oct 11-Oct-18	7.74	197.1 195.9 199	11.22 12.43 12.73	782 787 760	391 393 380	2.7 2.2 10.5	9.7 8.3	30.03 29.61 29.68	0.5	<1.8	0	0.368	<3.1	22																								
Oct 12-Oct-18 Oct 13-Oct-18 Oct 14-Oct-18	7.61	230.5	14.96 12.46 13.81	738 780 735	369 399 367	2.7 2.2	0	29.88 29.88 30.12				10 0																										
Oct 15-Oct-18 Oct 16-Oct-18 Oct 17-Oct-18	7,6	200 258.5	13.6 13.17 14.09	778 789 737	369 394 368	8.6 1.3 1.2	0.7 4.3 3.9	29 95 30.13 30.32	0.02	41.8	11	0.14	41	6																								
Oct 18-Oct-18 Oct 19-Oct-18 Oct 20-Oct-18	8.13 7.61	160 238.4	14.54 12.42 15.50	730 708 718	364 354 359	2.4 6.2 0.9	2.4	30											Contract of																			
Oct 21-Oct-18 Oct 22-Oct-18 Oct 23-Oct-18	7,28 7.24	202.4 193.6	13.66 14.31 10.63	713 725 630	367 361 315	1.6	4.8	30.01 28.85	0.00		8	0.099	421	8	<0.002	s0.002	50.01	10.002	10.002	10.01	10.002	0.45	2	0.004	10.002	0.026	0.004	<0.005	0.4	0.026	10.002	0.08	<0.02	<0.06	1.268	No.		<0.002
Oct 24-Oct-18 Oct 25-Oct-18 Oct 26-Oct-18	8.14 7.72	160.2	15.17 14.04 15.10	623 560 562	315 311 200 281	33	2.2	28.7																														
Oct 27-Oct-18 Oct 28-Oct-18 Oct 29-Oct-18	7.44	226.4 181.7	13.12 14.54 12.73	533	207	1.4	3.5	29.09 29.43 29.63																														
Oct 30-Oct-18 Oct 31-Oct-18 Nov 01-Nov-18	7.78	182.5 213.9	11.71 10.98 14.29	690 681 718	297 345 340 359	1.0	1.4 4.8 4.7	29.83	0.03	<1.5	2	0,073	<3.1	14																								
Nov D2-Nov-18 Nov D3-Nov-18 Nov D4-Nov-18	7.74	180.4	13.55 14.11 13.46	731 746 748	348	1.5 1.9	5.4	20.56 20.52 20.41																									19					
Nov 05-Nov-11 Nov 06-Nov-11 Nov 07-Nov-11	7,79	108.5 108.2	12.50 13.26 13.60	752 738	376 360 370	2.0 2.3 3.3	5.7			<1.8	12	0.063	<3.1	8	0.002	≠0.002	±0.01	+0.002	40 002	-0.01	-0.002	0.53	2	+0.002	0.002	0.02	0.006	0.005	0.2	0.017	:0.002	0.122	<0.02	<0.05	1.213			<0.002
Nov 08-Nov-11 Nov 09-Nov-11 Nov 10-Nov-11	7.77 8.03	166.5 130.9	12.49 12.45 13.54	739 064 060 637	312 330 318	12.1 2.4 0.7	0.5 2.3	29.70 29.60 29.74				Maria de la composición dela composición de la composición de la composición dela composición dela composición dela composición de la composición de la composición dela composición de la composición dela		Name and Address of the Owner, where the Owner, which the	Chinasho:			Yamman						Nil and			Berminalis	Gue un			The second							
Nov 11-Nov-11 Nov 12-Nov-11 Nov 13-Nov-11	7.0	140.0	12.5 13.45 13.20	607 611 708	304 305 364	1.5 0.7 1.3	3.5	29.78 29.83 20.6				MISCALINE.																										
Nov 14-Nov-16 Nov 15-Nov-16 Nov 16-Nov-16	7.04	165.0	12.03 12.04 11.72	600 600	334 348 320	1.5 1.5 21.1	11.1	29.87	0.88	<1.8	10.3	0.050	<3.1	4																								
Nov 17-Nov-1/ Nov 18-Nov-1/ Nov 10-Nov-1/	7.85	184.8	13.30 12.60 13.20	761 820	381 410	1-1	10.1	30.54 30.6 30.53	1.58	<1.8	11.3	0.095	<3.1	4																								
Nov 20-Nov-11 Nov 21-Nov-11 Nov 22-Nov-11	8.15 7.72	140.3 183.4	13.03 11.61 13.41	767 705 511 674	384 353 266 337	2 3 3.8 10 3.7	10.4									Billion .			-								-	1					4 11 11111					
Nov 23-Nov-11 Nov 24-Nov-11 Nov 25-Nov-1	8.3	163.3	13.05 9.77 10.81	642 636 668	321 318 334	1.3	63																	1000							- Only					100		
Nov 26-Nov-1 Nov 27-Nov-1 Nov 28-Nov-1	0.85 7.75	271.8 319	8.13 13.5 15.91	681 680 703	341 339 351	3.4 1 5.3	10.9 5.1 9.8	29.33 29.26 29.11	0.7	<1.8	11.3	0.127	<3.1	2																								
Nov 29-Nov-1/ Nov 30-Nov-1/ Dec 01-Dec-1/	8.10	182.0	15.4	737 735 747	368	9.2 7.5 2.8	10.3	29.03																														
Dec 02-Dec-1 Dec 03-Dec-1 Dec 04-Dec-1 Dec 05-Dec-1	8.18	191.5	15.54 13.26 11.60	713 708 681	372 366 364 340	2.6 3.5	8.7	29.58 29.42 29.45 29.57																														
Dec 05-Dec-1 Dec 06-Dec-1 Dec 07-Dec-1	7.66	202.9	13.25	711	356	1.6	8.3 7.0	29.49 29.65	0.57	41.8	13.1	0.195	<3.1	2	<0.002	50.002	50.01	10 002	50,002	50.01	50.002	1.08	2	0.014	97.002	0.012	10 003	<0.005	0.1	0.021	50.002	0.14	<0.02	<0.05	2.767			0.27
Dec 06-Dec-1 Dec 09-Dec-1 Dec 10-Dec-1	7.82 7.75 8.64 8.60 8.11	173.2 418.7 111.6 211.2	13.62 12.92 14.22 14.67 14.29	830 782	423 415 391	1.6 1.7 1.5 10.4 2.6		29.55																														
Dec 10-Dec-1 Dec 11-Dec-1 Dec 12-Dec-1 Dec 13-Dec-1 Dec 14-Dec-1	7.6	272.2	13.36	767 766 798	388 383 398	2.6 3.8 4.3 1.9	6.7 6.1 9.2 7.1	29.38	0,62	<1.8	13.9	0.119	<3.1	2																								
Dec 16-Dec-1 Dec 16-Dec-1	7.86 7.55 7.92	279.4 251.5 389.2	12 04 13 16 14 05	910 740 745	374 373	15.9 5.3 1.4	in reco	29 21 29 10																														
Dec 15-Dec-1 Dec 16-Dec-1 Dec 17-Dec-1 Dec 19-Dec-1 Dec 19-Dec-1 Dec 20-Dec-1 Dec 21-Dec-1	8.51 8.05 7.81	178.1 345.2 321.4	13,16 14,05 15,36 14,52 13,64 14,63 12,67	766 726 710	384 383 324	6.4 4.4 6.2	7.2 7.1 7.7 7.7	20.3	0.53	×1.8	11.4	0.284	<3.1	4																								
Dec   15-Dec-1	8 6.43 7.86 8 7.65 9 7.62 1 8.51 9 8.05 1 7.81 1 8.1 8 1 8.1 8 7,42 8 8.07 8 6.55 7.76 9 6.55 9 7.55	262.4 279.4 251.5 369.2 176.1 345.2 321.4 162.2 362.2 176.1 264.5 209.6 241.5 124.6 125.3 240.6 125.3	14.63 12.87 13.12	808 846 830 782, 767, 766, 766, 766, 766, 766, 766, 76	404 423 415 304 415 308 308 405 317 317 324 325 309 300 300 300 300 300 300 300 300 300	6.4 4.4 5.2 2.7 11.2 20.6 3.1 2.9 3.2 3.6 4.6 7.7	7.7	29.57 29.41 29.68 29.25																														
Dec   21-Deci     Dec   22-Deci     Dec   24-Deci     Dec   24-Deci     Dec   26-Deci     Dec   26-Deci     Dec   26-Deci     Dec   26-Deci     Dec   36-Deci     Dec   36-Deci     Dec   36-Deci     Dec   36-Deci     Dec   36-Deci	7,42 8.07 8.05	204.5 213.7 270.5	12.67 13.12 13.02 14.95 14.36 13.06 14.16 13.76 13.48 10.62	600 605 702	350 348 365	3.1 2.0 3.2	7.3	29.05		III EX										Miles III					I DEL					100					MAIN TO			
Dec 26-Dec-1 Dec 27-Dec-1 Dec 28-Dec-1	7.76 7.55 8.1	209 6 241 5 124 6	13.05 14.16 13.76	714 738 691	367 362 346	3.6 4.6 7.7	7,4 10 0.7	28.21		<1.8	12.8	0.262	43.1	2																								
Dec 20-Dec-1 Dec 30-Dec-1 Dec 31-Dec-1	8.31 7.47 7.77		13.46 10.82 12.08		354 316 310			28.30 27.60 28																- 10														
2001 V 3"VIRETY, E		215.7	14.00			4.8	6.5	27.8 27.81 27.25	2.15	<1.8	12.7	0.284	<3.1	2	<0.002	±0.002	<b>40.01</b>	#0 002	<b>10</b> ,002	10.01	4002	0.39	5.4	6.002	10.002	0.016	0.002	<0.005	<0.1	0.021	10.002	0.438	<0.002	<0.05	1.447	0.1		0.13
	-0.19	255.7 308.6 220.3 176.2 232.8 176.4 212.6 136.5 166.7 200.7 100.8 235.8 205.5 112.4 150.7 16	12.33 13.60 14.30	591 540 525 482 572 532 532 524 460 580 640 640 640 747 737 760 706 706 706 706	234 286 266	2.3 1.8 2.0 3.8 5.3 4.3 2.1 3.2 2.5 10.0 1.9		28.38 27.63 28.05											27																			
Jan 07-Jan-1 Jan 08-Jan-1 Jan 09-Jan-1	8 1 7,02 8.13	175.4 212.6 136.5	14.15 13.78 13.28	524 458 580	262 207 290	4.3 2.1 3.2	9.7 8.6 8.7 12.3	28.05 27.8 23.68 22.72 28.51	0.52	<1.8	13.2	0.326	<2.1	2																								
Jan 07-Jan-1 Jan 06-Jan-1 Jan 06-Jan-1 Jan 10-Jan-1 Jan 10-Jan-1 Jan 11-Jan-1 Jan 13-Jan-1	81 7,62 8,13 9,8,14 9,8,16 9,8,16 9,8,16 9,8,16 9,9,16 9,7,23 9,7,23 9,7,23 9,7,23 9,7,23 9,7,23 9,7,23 9,7,23 9,7,23 9,7,23	186.7 200.7 196.8	13.28 12.46 13.46 13.46 12.31 14.12 13.12 13.25 10.56	640 640	310 324 293	10.0	12.3	28.51 26.9 26.56 26.75				100 mm								Name of Street		200				India h												
Jan 13-Jan-1 Jan 14-Jan-1 Jan 15-Jan-1	6.38 7.23	235.5 205.5 112.4	14.12 13.12 13.25	747 737	315 374 360	1.4 2 1.4 2	10	28.57																														
Jan 14-Jan-1 Jan 16-Jan-1 Jan 16-Jan-1 Jan 17-Jan-1 Jan 18-Jan-1 Jan 18-Jan-1 Jan 20-Jan-1	7.99 7.98 8.05	152.3 71.4 105	10.55 13.29 14.67	716 769 735	358 365 367	1.6 2 1.7	7.3 14.1 17.0	27.98 27.87		41.8	- 11	0.350	<3.1	2																						THILAWA	DEV	
Jan 19-Jan-1 Jan 20-Jan-1 Jan 21-Jan-1	7.9t 7.75 8.15	213.4	15.03 15.34 14.27	718 812 700	350 372 350	9.4		28.01																											- 4		18	
Jan 21-Jan-1 Jan 22-Jan-1 Jan 23-Jan-1 Jan 24-Jan-1 Jan 25-Jan-1 Jan 25-Jan-1 Jan 27-Jan-1	8 15 8 15 8 1 7 182 7 7 8 9 7 184 9 7 184 9 7 07	116.5 140.5 201.6	14.16	700 746 723 648 830 674 882 702	373 362 383	0.4 3.3 2.1 1.8 2.5	16.8 10.1 11.3 11.8	27,38	0.95	<t 8<="" td=""><td>14.5</td><td>0.36</td><td>&lt;3.1</td><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>18</td><td>MJT</td><td></td><td></td></t>	14.5	0.36	<3.1	2																					18	MJT		
Jan 25-Jan-1 Jan 26-Jan-1 Jan 27-Jan-1	7.0 7.04 8 8.00	201.6 190.4 101 266.6 242.5	15.26 13.36 12.07 14.26 14.50	674 674	415 337 441	2.5 1.0 1.3	15.4	27.60 28.66 28.18									U.S.																			Man *	TIME	
Jan 28-Jan-1	7.07	242.5	14.50	762	392	2.7	19.1	29.34																lle e					100									

		1.23	of the state	44 5 -	P		50 S. mar		Acres 1			S15		#8			. E. SAR S			de la	Outlet	1/20	U DELLE	I Samuel	. J. HULL		diam'r	11425	1.40	EZELES				35.4	400000	U/JULIAN.	L = TITE	ركان الليابة	
				-			i de la composición dela composición de la composición de la composición de la composición dela composición de la composición de la composición dela composición dela composición de la composición de la composición dela composición del composición dela c				-	1	9310	Trace In	100			8 8		100	See All	4. N	200						2000	Free	Formal-				Hexavalent				
Month	Date	pH	ORP	DO	EC	TDS	Turbidity	COD	Temp	800	T-Cell	T-N	T-P	O&G	55	Cyanide	Chromium	Arsenic	Mercury	Cadmium	Selenium	Lead	Color	Odor	Zinc	Copper	Barium	Nickel	Sulphide	Chlorine	dehyde	Silver	Iron	Ammonia	Chromium(Cr6+)	Fluoride	Total Chlorina	Total Cyanide	Phenois
			1	- 1	Daily P	arameters						Weekly P	arameters											live .			M.	onthly Param	eters										
	Unit		mv	mail.	ua lom	Max 2,000	ENU	Max 125 ppm	Max 35	Max 30	MNP/100ml	Max 80	Max 2	Max 10	Max 50	Max 0.1	Max 0.5	Max 0.1	Max 6.005	Max 0.03	Max 0.02	Max 0,1	Max 150		Max 2				Max t	Max 1	Max 1	Max0.5		Max 10	Max0.1	Max20	Max3.2		Max 0.5
Jan	29-Jan-19	8.5	129.5	12.2	529	204	0.25	26.0	26.72	ppm	MINT TOOM	ppin	ppin	ppin	ppin	ppin	ppin	PPIII	PPIII	ppiii	Ppm	Plant			Pierr	Ppm	Political	Ppm	ppin	ppin	ppin	ppin	Ppin	ppin	ppiii	ppan	ppiii	Ppin	Plan
Jan	30-Jan-19	8.3d 8.05	342.1	12.01	827 948	414	6.2	23.3	27.98	0.95	<1.8	13.1	0.543	<3.1	2																								
Feb	31-Jan-19 01-Feb-19	7.86	300.8	11.93	964	482	6.7	21.8	27.67					The same	A-9																								
Feb Feb	02-Feb-19 03-Feb-19	8.01 7.88	292.1	12.83	936	408	0.3		24.51					1 10 10	S COMMON						152 116									Marie Park		(moreon)							
Feb	04-Feb-19	7.0	363.3	12.11	793	307	1.6	20,2	28.20												Comments																المريسين		
Feb	05-Feb-19 06-Feb-19	7.27	384.6 376.2	12.53	892 827	446	1.7		27.75	HEREN	Yar	nk Cleaning	and Mainten	ance	70.00																							Accept Hill Comp	
Feb Feb	07-Feb-19	8.11	128.5	12.01	881	441	4.1		27,68		RI III BURN																-					4							
Feb	08-Feb-19 09-Feb-19	7.00	140.7	8.0 5.17	1371	448	7.4	10000	27.46		COLUMN TWO	THE PERSON NAMED IN							I HERE				THE REAL PROPERTY.		MILLION CO.	AND PROPERTY.		SHIP WAS			THE REAL PROPERTY.	ORDINAL DE		- 6000000				DESCRIPTION OF THE PARTY OF THE	-
Feb	10-Feb-19	7.01	50,9	9.09	350	176	6.2		27.1													No.																	
	11-Feb-10 12-Feb-10		142.5	7.29 8.61	875 853	437	4.8	THE OWNER OF THE OWNER.	26.89	Ginter Se	DECEMBER OF THE PERSON NAMED IN			ter in the same	and an early	- Anglani Co	W-100	Commission of the last		A STREET, STRE	THE PARTY OF	THE REAL PROPERTY.	Current V	White I	ATT PER TOTAL		And the latest the lat			STREET, STREET		Contract to		100				Sendant.	
Feb	13-Feb-19	7.84	172.8	9.4 2.82	843 810	421 408	8.8		27.54 27.44		Tal	nk Cleaning	and Mainten	anco	1																	2 1							
Feb	14-Feb-19 15-Feb-19	7.07	124.0	3.47	818	400	6.7		27.46		02-10			at II Our II			, S				20.00																		and the second
Feb	16-Feb-10 17-Feb-10	5.89 5.97	54.1 120.8	2.00	813 700	400	5.4 4.2	ALC: HILLIAM	27.26 27.37						\$ 100 mm	EXAMPLE:			118/																				
Feb	18-Feb-10	7.12	110,0	3.12	690	412	4.7		26.97		Manager 1																												
Feb Feb	19-Feb-19 20-Feb-19	7,09	36.6	6.28 8.14	823 808	411	3.1		26.96		Tal	nk Cleaning	and Mainton	Ance	)),								1000																
Feb	21-Feb-19	7.26	53	6.16	842	407	2.0		26.67	سميس		7				841611.																							
Feb	22-Feb-19 23-Feb-19	7.04 6.72	27.3 30	2.57 4.46	780 816	390 407	32.4		20.12		and the second		THE RALL		THE SHARE SHAW	540000000000000000000000000000000000000	William St. Lond	CO.	TOTAL COLUMN	COLUMN TO SERVICE	THE REAL PROPERTY.	SHIP OF THE PARTY OF		OCCUPANT OF THE PARTY OF THE PA	Constitution of the last of th	COMPANIE OF THE PARTY OF THE PA	AND THE REAL PROPERTY.	I I SHE I SHE I				2000	COLUMN TO SERVICE STATE OF THE PARTY OF THE		NAME OF TAXABLE PARTY.	THE RESERVE	511,000 (april 12)		
Feb	24-Feb-19	0.01	78	3.81	793	300	2,1		26.95	Maria III				NO THE																00000		NAME OF		TO THE R					
Feb		7.04 6.01	7.01	30.5	709 345	301 645	3.1 2.1		26.67 27.20									10000												- 120		200							
Feb	27-Feb-19	6.08	28.7	2.02	832	416	2.1		27.4		Tai	nk Cleaning	and Mainten	ance		127111																		-					
	28-Feb-19 01-Mar-19	7.17 6.81	20.2 148	4.35 0.29	807	433	-		27.4		100			1000			1000				Marie Park		A DOMESTIC			100				- 7	12000	Or Availly 1980	10000	NAME OF TAXABLE PARTY.		100 March 1980			
Mar	02-Mar-19	6.75	151	0.46	748	510 441	3.7		27.29	1000		100100							10000							2011		10 10 1											
Mar	03-Mar-19 04-Mar-19	6.62	154.7	1.23	834 831	410	1.0		28.26 28.68	A THE PARTY NAMED IN	College College	The second								A STATE OF THE PARTY OF	- Harrison		17		A STATE OF THE PARTY OF THE PAR						Transmission of the	2000	Total Control				The second second		
Mar	05-Mar-19	5.87	157.5 83.8	2.26	814 850	407	1.6		27.03 27.13	(IIIII)	Tar	nk Cleaning	and Mainten	Ance	HISH.										W														
Mar		7.01	83.8	3.28 4.45	845	423	1.2		27.28		La	I		1			1				Secretary 1			V		1						4							
Mar		7.14	66.2	2.08	801 896	431	0.3		27.62 27.64							COLUMN TO THE REAL PROPERTY.											10200	THURSDAY.			1 to 100 to 1								
Mar	10-Mar-10	6.96	1.3	3.26 4.7	1056	523	0.0		20 68				1000		AU INC.	TEST I			District Co.			S EXOKS	The same	SIL	illed (SZ )						NU SAMO DE			BB					
Mar		7.01 6.68	1.5	3.25	748 850	452 455	1.5		28.05															Salar II			-			100									
Mar	13-Mar-19	7.08	1.3	4.7	850	423	1.3		29.68	-	Ta	nk Cleaning	and Mainten	ance																	100								
Mar		7.23	1.6 237.8	3.0 4.34	873 870	481	1.6		29.62		1											HIERON																	
Mar	10-Mar-19	7.70	153.2	4.48	872	436	2.8		27.07			100	DOMESTIC:	ROOM STATE			THE SECOND			NO.								1000								N 0 8		- This	
Mar	17-Mar-19 18-Mar-19	7.31	24.5	6.27 4.54	872	430 420	3.1		30.26										-																				
Mar	10-Mar-19	7.41	95.9	6.45 6.34	863 872	435 436	2.1		31.21 28.83		Ta	nk Cleaning	and Mainten	ance						INCOME NAME OF THE OWNER, OWNER, OWNER, OWNER, OWNER,	- CO 104										-	The state of the s		A CONTRACTOR OF THE PARTY OF TH				THE PARTY NAMED IN	
Mar	20-Mar-19 21-Mar-19	7.41	124.4	6.21	801	431	3.1		27.53																														
Mar	22-Mar-19		90.0	5.47	874	437	10.9		20.67						1100		-			A DESCRIPTION OF			-	Section 1					-				-	The state of the s					
Mar	23-Mar-19 24-Mar-19									W TH							100		DI III				أعملنا			- 0111				CHE		1000 mil			1/0 10				
Mar	25-Mar-10	7.42	98.7	6.31	856	957	9.2	-	28,33		7.	ink Cleaning	and Mainter	ance			and the second	All I																					
Mar	27-Mar-10	7.52	120.3	6,2	724	323	3.2	1000	27.24			1			tem o			1											-	- 199		-	-						
Mar	28-Mar-19	7.26	173.1	4.74 5.19	1101	551 809	1.4		30.21																														
Mar	20-Mar-10 40-Mar-10	7.01	70.2	1.61	1303	651	22.7		29.32	THE REAL PROPERTY.	To de la constitución de la cons	111111111111111111111111111111111111111						3-3-3															UATE OF						
AllANA	3 Mar-19	7.08	410.1	4.05	1292	568	0.8		30.04	SUPPLIES.		100			10000				THE LOS				977	COLUMN TO SERVICE STATE OF THE PARTY OF THE															

MJTD WATER

Monitoring Parameters Result for STP(Phase-2) Leed DO EC TDS COD 800 T-Coll TH 1.0 OAG 13.81 -01 0.002 10.002 10.01 10.002 10.002 50.01 10002 8.40 0.05 10.002 0.02e 0.044 0.028 0.11 4.24 .28.6 +0.05 0.574 0.027 7.81 0.95 16.71 >150000 
 Oct
 19-Oct-18
 7.55
 238.1
 10.11
 640
 320

 Oct
 29-Oct-18
 7.85
 191
 13.54
 623
 412

 Oct
 22-Oct-18
 7.11
 203
 12.29
 620
 313

 Oct
 22-Oct-18
 7.14
 201.2
 13.21
 604
 278

 Oct
 23-Och-18
 7.59
 212.8
 10.18
 407
 249

 Oct
 24-Och-18
 7.79
 180.5
 12.16
 466
 230

 Oct
 25-Och-18
 7.82
 164.8
 13.11
 506
 230

 Oct
 25-Och-18
 7.83
 281.7
 12.20
 10.22
 611

 Oct
 25-Och-18
 7.38
 228.2
 12.7
 405
 247

 Oct
 25-Och-18
 7.54
 20.8
 13.36
 642
 321

 Oct
 25-Och-18
 7.54
 20.8
 13.36
 642
 321

 Oct
 25-Och-18
 7.54
 20.5
 30.13 30.25 30.32 29.61 29.75 30.68 30.4 29.97 30.51 30.51 30.37 30.51 30.36 29.59 30.17 30.38 29.59 30.36 29.59 30.36 30.36 30.36 30.36 30.36 30.36 30.36 30.36 30.36 9.76 6.008 11.3 12.43 >1000000 10.6 1.37 10.1 2.45 18.5 0.05 8.37 0.13 25.66 >180000 0.950 <3.1 +0.002 50.002 40.01 60.002 10.01 K0.002 0.024 0.000 <0.005 10.1 0.003 0.888 <0.05 3.100 \$3.002 60:002 90,002 16.75 >100000 0.7 0.783 <1.1 14.6 >160000 10.8 +3.1 20.02 >100000 0.322 28.56 28.97 28.86 27.24 29.86 29.86 29.86 29.86 29.86 29.86 29.87 29.87 29.87 29.87 29.97 19.02 10.8 0.8 G.1 <0.002 +0.002 10.01 € 002 +0.002 10.01 €0.002 3.4 1.4 0.026 0.006 0.018 0.008 0.007 ×0.1 ±0 002 1.60 7.35 0.283 +0.05 -0.1 8.17 >100000 12.3 0.006 <3.1 8.6 >160000 13.1 1.31 41 22 10.8 >100000 18.7 1.11 <3.1 15.84 18.1 1.42 >160000 <3.1

E(MJTD)

7.2 7.2 6.8 12.4 9 9 4.2 15.5 0.9

9.67

10.1

0.004

0.008

SD 002

50.01

10 002

10.002

60.31

40.002

6.85

0.000

0.008

63.002

0.000

0.012

<0.1

0.032

89.002

2.00

10.8

Monitoring Parameters Result for STP(Phase-2)

Monitoring	Paran	eters Result	for STP(	Phase-2)			_				_	_		_		_	_			Inlet		_			_			_		_			_	_				
Month Dat	.	pH ORP	00	EC.	TOS	Turbidity	coo	Temp	800	Y-Call	T-N	74	OSG	55	Cyanide	Total Cyanide	Chromium	Areenin	Mercury	Cadmium	Selection	Lead	Color	Oder	Zna	Copper	Barton	Nickel	Sulphide	Free Chlorine	Formal- dehyde	Silver	iron	Ammonia	Hexavalent Chromium ( Crite)	Fluoride	Total Chlorina	Phenois
	-		_	Dally P	eremetere						Weekly !	aramatere							1100		-	A1	-	-	-	Monthly Parene	dera.		-				-					
MANGAGE	_	***			I Marrie Wall	-	Mary May 1	THE PERSON NAMED IN	Was the same	-	I May an	Mark	- Boy et	No. of	West	Mare	Abres 1	March	- May Cath	Mar 101	March 42	March	150	100	Mar 2	No. 65	Mart	NAME OF TAXABLE PARTY.	Mart	Mar 1	Mark	- work	The state of the s	The second	- Mark I	Service of the latest service of	THE REAL PROPERTY.	March
Unit		Part		pam	ppm	ppm																																
					Section 1																																	
Feb 13-Feb	b-10	8.04 294.1	3 10.6	12 1008	529	5.9	44	29.24	20.73	>160000	17.6	1.07	41	18																								
Feb 14-Fet	b-18	7.0m 42.0	3.5	1 702	351	28.1	83	29.41																							-							-
Feb 15-Feb	b-19	6.66 12.1	7.5	5 670	336	22.5	50	29.71				-	-				-	-	-					-	-					_						-		
eb 15-Fet	0-1P.		1.6	030	316	22.0		29.41										-		-				-														
Feb 15-Feb	10		21	4 610	401	20.0	52	29.3												-								1										
Feb 19-Feb	0-10		4.1	6 660	340	28.5	46	29.7																									-					
eb 20-Feb	b-19	6.87 29.4	3.6	1 493	245	17.1	68	29.45	25.65	+100000	17.7	1.40	41	26								-																_
Feb 21-Fel	b-19	6.72 22.8	0.0	2 913	457	19.3	67	20.41				-	-								-																	
65 22-fet 65 23-fet	b-10		0.1	875	432	19.1	62	20.76	-		-	-	100000				District of	-		Section 1	-	1000			-													
(a) 24.5 at	6-19		110	0 244	122	14.0	1		-			100						-					111	100			100000		Jan 1									
Feb 25-Feb	b-19		1.1	3 346	100	11.0	42			51																												1
Feb 26-Feb	b-19	0.00 45.4	4.1	1721	860	21.7	60	29.88		- I all and a second																												
		0.03 -42.4	4 5.0	0 803	402	5.04	34	30.15	12	54000	10.4	9.61	41	20																								
		8.60 81.1			255	9.0																11111	_								100	-				-	-	$\overline{}$
Mar 01-Ma	pr-10	8.80 87.1	1.0	7 600	250	0.8	- 72	29.00					-	-			To the last of	1	THE PERSON NAMED IN	0.00		-	100			-		0.000	T		And the last of th		1000000	110		in the second		-
Mar 02-Mar	P-10	741 780	2 24	2 440	346	8.2	F 7-1-7	27.40					-						100000000000000000000000000000000000000				13 - 11	200					-			200						
		6.64 40.6	2.5	2 703	381	12.8	31	29.63											1																			
Mar 05-Ma	in to	0.00 82.0	4.1	2 015	308	23.1	118	29.60		THE RESERVE OF	-			11		-	1000	and the second	100000	20/11/11	Table 1		-		1000	1110000			The second		1000				Marian Control	Contract of the Contract of th		1707
Mar 06-Ma	u-10		1 17	3 1107	563	8.0	64	29.65	12	>160000	10.2	1.3	53.1	20	0.002	0.005	10.002	:0.01	10.002	10.002	10.01	HD:002	6.73	1.4	10.002	16.002	0.02	0.02	<0.005	40.1	0.091	+0.002	3.31	13.6	*0.05	2 203	<0.1	0.12
Mar 97-Ma	и-19				378	0.0	38	30.04			-														2011110200000													
			1 1.0	0 024	813	175	31	30.43	100	Control of the last	STATE OF THE PARTY OF	Name and Address of the Owner, where	alexander resident	dimen-	OR PROPERTY.	THE REAL PROPERTY.	1000	Charles In Section	Constitution.	The State of the S	Committee of	Contract of the last	Aller Division in the	Control of the last	Service Married	THE REAL PROPERTY.	Other Designation of the last	original property and the second	Control of	With the Park Street	COMPRESENT	Section Sections	- I-lamini	The same	um - me	All little services	Constituted and the	Charles W.
May 10 AM	m-10		9.0	4 950	803	0.0		20.53			THE RESIDENCE						OSTERNO DESCRIPTION OF	THE R. P. LEWIS CO., LANSING, MICH.		CONTRACTOR OF STREET	COMPANIE S	5 -		100					100					ALLEY BUSINESS	COLUMN TO SERVICE STATE OF THE			
Mar 11-Ma	r-19		1.6	3 843	378	1.0	47	36.41					2000000				Direction of the last		-	Control of the Contro	النادي النابي المناول ال				X-11-04				1114				Mary III	and the same of th				
Mar 12-Ma	u-10	0.60 152	2 07	7 862	138	1.0	63	29.03							Ho										1 11 11 11													
May 13-Ma	ar-10		2 0.0		376	11.2	33	30.33	32.67	>100000	20.1	2.13	3.27	20		101																						A SHIPTER
						0.4	34	20.98 20.4					-		The same of																-					$\overline{}$		
Mar 15-Ma	W-10	0.81 130		0 1000		7.7	- 00	30.82		THE REAL PROPERTY.	OTHER DESIGNATION OF THE PERSON OF THE PERSO	Name and Parket	100	The state of the s		100	THE RESERVE	THE SECTION	CONTRACTOR OF THE PARTY OF THE	CONTRACTOR AND ADDRESS OF THE PARTY.		MIN .	Military and		THE RESERVE		CONTRACTOR OF THE PARTY OF THE	The State of the S	BWTHISSHIP	Charles III	CHANGE CO.			(-0		All lines		
Mar 17-Me	Nr-10	8.78 105	6 30	1 996	562	7.0		30.38		1000		BUILDING STREET	The latest like the latest line the latest like the latest like the latest like the latest lin	Maria de la Companya			THE RESERVE	District Co.	بالترازية الرابع				No.			وعالم أراوا	السناسية		DOM:				NAME OF TAXABLE PARTY.					
Mar 18-Me	ar-10	7.12 140	0 2.1	7 789	403	7.4	-33	30.25					The same of		110	1111							1111		SILL STATE OF							-						-
Mar 19-Ma	ar-19	6.72 142	7 3.1	6 887	345	7.6	202	30.36	68.32	>1600000	14.4	2.38	9.1	14:				-	-	-					-	-									-			
Mar 20-64	ur-10	6.24 160	0 13	905	452	39.3		30.50	n-und a	1000	The second second	100					-	The same of	-	-								100-00-001	10.00	-					100000	All Property lies	THE RESERVE AND ADDRESS.	
Mar 21-M	Ar-19	7.10 106.	Column   C																																			
Mar 23.64	96-10		0.0	010	410	7.0	The second second	30.74	STATE OF THE PERSON NAMED IN	-		The state of the s		ALL DOCUMENT		Section 1	Automotive and	THE REAL PROPERTY.	Section 5	Constitution in	The second line				STATE OF THE PERSON NAMED IN	THE RESERVE	3-12-03				0	- 1 CO 1		THE RESERVE		MALID STREET		
		0.71 62.6	Part																																			
Mar 25-M	ar-19																																					
Mary 30 Adv																																						
Mor 27-M	MC-19	7,00 66.5	1 23	547		118	440	29.45		-		E1250	2	7	-				-	1000	-			-			-			qui .								
Mar 28-M	or-19	7.05 136	2/	1107		20.5		29.20																														
Mar 30 Mg	Part   Part				1000																																	
MAN DEAM	pr. 19	7.23 162	2 01	M 1256	0.79	19.7	1			High control	C District									1000	A	distribution of the last of th													-	All Landson		



Part	Monitoring Par	ameters Re	sult for ST	P(Phase-2)			Title					_					100141		_	7/101			Or Estinate				ALCO DE LA CONTRACTOR DE											
The column		out	OPP	DO.	80	TOS	Turbiditu	COD	Town	200	T.Coll	TA	7.0	ONG	99	Cyanida	Total	Chromium	Armedo	Marcuny	Cadmium	Salankum	land	Color	Odor	Zina	Conner	Barbun	Mickel	Subshide	Free F	ormal-				Fluorida	Total	Physicals
	Month Date	pri	UKP	00			Turbidity	COD	, semp	800	1-001			Jau	00	Суались	Cyanide	Chromain	Arranic	mercury	Cadmium	Selenium	Lead	COROF	Odor			Daritim	MICKET	authura (	Chlorine d	ishyde S	liver iro	Ammon	(Cr6+)	Fluoride	Chlorine	Phonois
Part	Standard	and a	San Maria	100 miles	Daily P	Max 2,000		Max 125	Max 35	Max 30	Max 400	Max 80	Max 2													Max 2	Max 11.5									Max20	Max0.2	Max 0.5
Note	Oct 01-Oct-18	7.32	234.2	mg/l. 11.82	μπ/cm 736	99m 368	5.5		*C 30.22	ppm	MNP/100m1	ppm	ppm	ppm	ppm	ppm	pprn	ppm	ppm	ppm	ppm	ppm	ppm			ppm	ppm	ppm	ppm	ppm	ppm	ppm 1	opm pp	m ppm	ppm	ppm	ppm	ppm
Note	Oct 03-Oct-18			14.23	737	308	1.3	7.2 8.6	30.34	0.1	<1.8	8	0.000	<3.1	4	<0.002		s0.002	10 01	≤0.002	x0.002	s0.01	\$0.002	22	1	0.005	<0.002	D.016	0.016	<0.005	0.5	0.02 ≰	0.002 0.0	40 7.2	<0.05	1.382	0.006	
Part	Oct 04-Oct-18 Oct 05-Oct-18	7.85	218.9	13.68	744		3.6	10.1	30.16			- 12-		m												81 - 13												
State   Stat	Oct 07-Oct-18	7.03	176.7	14.87	825 840	412 420	6.8	10	30.84																													
Note	Oct 09-Oct-18 Oct 10-Oct-18	7.79	197.1	11.20	851 805	425 403	2.7	7.1 5.8	30.09	0.12	<1.8	-	0.349	<3.1	14																							
State   Stat		7.81	198.5 230.6	12.99 13.99	837 787	393	1.6	11.5	29.96 30.19																													
Part	Oct 14-Oct-18	7.73	300.0	13.37	733 noa	349	2.3		30.64																							1000						
Note	Oct 15-Oct-18	7.73	258.2	14.17		380	3.3	7.2	30.35	0.12	<18	0	0.213	631	- 19																							
Note	Oct 18-Oct-18 Oct 19-Oct-18	8.03	171.4	14.37	696	348	22.9	9.8	30.32				77.10																									
State   Stat	Oct 20-Oct-18	8.07	107.5	14.15	721	361	3.3		30.56 29.93																													
Part	Oct 22-Oct-18	7,83	108.7	14.31	723 625	353 262	43	0.4	29.02	0.37		8	0.145	<3.1	2.																							
Column   C	Oct 25-Oct-16	7.88	195	14.04	527	263			28.01															-													Elou-	
Column	Oct 27-Oct-18	7.49	219.5	13.31	686	343	0.5	**	29.74														100															-
Note	Oct 29-Oct-18	7.79	198.6	14.03	575	288 364	0.8	5.0	30.13																													
State   Stat			100.0	10.00	693 721			10.9	29.50	0.66	<1.8	2	6,071	<2.1	2																							
No.	Nov 02-Nov-18	7.95	107.7	12.20	755 806		2.3	10.7	29.96							IWI	-																			-	7000	
No	Nov 04-Nov-18 Nov 05-Nov-18	7.8	170.7	11.7	763	349	0.0	11.3	29.93	0.0		99	0.112	257	-	N MAN		0.002	201	40000	A 002	*0.01	<b>*</b> 0.003	3.40	-	<b>4</b> ,000	0.000	0.01	0.000	0.004	0.1	0.015	002	(2 4.57	-0.24	100		40.000
No	Nov 07-Nov-18	7.76	177.1	12.65	673	336	8.0		29.91				0.112					2.00	2.01		3.000	201	5.002			W-002	100	241	0.008	9.591	9.1	0.010	- V	407	40.05	1,505		40.002
Column	Nov 09-Nov-18	7.92	149.5	16.54	711		1.4	8.1	29.55 29.61																												-	
Column   C	Nov 12-Nov-18	8.06	151.5 171.2	11,03	074 048	337 324	1.0	5.3	29.51 29.53			V																										
See the section of th	Nov. 14-Nov-18	8.07	159.1	13.03	004	320	1.3	8.3 6.7	29.26	1.22	<1.8	11	0.092	<0.1	4																							
No	Nov 16-Nov-18	7.74	175.1	11.48	720	365	1.5	11.3	29.87																													
No.	Nov 18-Nov-18	7.75	183.5	11.88	801	401	0.0	11.5	30,17	1.8	<1.8	11.3	0.108	<31	- 2																							
See the section of th	Nov 20-Nov-18	7.88	104	12.01	762 742	361	1.2	16.7	29,92 29,58	Determined														- COLIN													10 3010	
State   Stat	Nov 22-Nov-18 Nov 23-Nov-18	8.03	170.3	12.39	730 718	360	1	8	29.40								A-MANUAL PROPERTY.				-								Contract of									
Second	Nov 25-Nov-16	7.50	214.3	10.94 12.44	750 760	382 390	8.7		29.32 29.31																													
Second	Nov 26-Nov-18 Nov 27-Nov-18	7.55	327.9	10.54	702	387 351	1.5	5.4 0.5	28,92	1.05	-119	10.7	0.122	(31																							1 1 1	
Second	Nov 29-Nov-18 Nov 30-Nov-18	8.01	226.2 192.1	14.02	742	371 370	1.2	10.6	28.46 28.69	11.12		10.7	4.142																									
Column   C		7.74	232.3 156.0	12.03	760 736	360	13		28.92																													
Second 1979		7.83	136.0	13.00	672	361 330	7.4 0.0		29.42 29.01																							-						
March   10	Dec 05-Dec-18 Dec 06-Dec-18	7,98	306.8	12.31	701	330 351	11	10.7	29.16	0.57	<1.8	13.1	0.195	<3.1	2	0.002		50.002	50.01	50.002	50.002	\$0.0t	50,002	0	2	0.02	50 002	0.016	0.004	<0.005	0,1	0 006	0.002	58 <0.02	<0.05	2.257		0.14
Column   C	Dec 08-Dec-18	7.81	148	13.23	000	345	1.3	<b>V.</b> B	29,08 29,34														No.						iluma i									
Column   C	Dec 10-Dec-19 Dec 11-Dec-19	7.95 8.03	232.5 236.1	14.16	065 718	333 359	0.32 0.35	8.4 8.2	29.13 29.45																													
10   10   10   10   10   10   10   10	Dec 12-Dec-19 Dec 13-Dec-19	7.88	267.3	12.14	750	378	1.0	8.2 8.4	29.17	0.62	<1.8	13.9	0.119	+5.1	2																							
Column   C	Dec 14-Dec-19 Dec 15-Dec-19	7.80	245.5 226.9	14,23	748 732	374	8.3	9.1	20.22												200	- Constitution														Mary Co.	M.S	indiana.
Column   Fig.   Fig.   Column   Fig.	Dec 17-Dec-19	8.31 7.08	218	12.02	754 754	376 367	1	6.3	28.09																													
Column   Fig.   Fig.   Column   Fig.	Dec 19-Dec-19 Dec 20-Dec-19	7.62 8.14	190.6	12.61	654 712	342 356	1.0	8.4	28.72 29.5	0.53	<1.8	11.4	0.264	×0.1	4																							
Column   Fig.   Fig.   Column   Fig.	Dec 21-Dec-18 Dec 22-Dec-18	8 08 8 56	280.7 176.2	12.81	001	348 331	2.8 23	9.3	20.08														185		- Unit													
Column   Fig.   Fig.   Column   Fig.	Dec 23-Dec-16 Dec 24-Dec-16	7.32 7.98	255.1	13.35	654	327 330	1.0	7.4	28.72	STEEL STREET,		10																	The same of		AND THE REAL PROPERTY.							
Column   C			202.6	12.61	702 649	350 325	2.5	04	28.06	2.74	<1.8	12.7	0.084	<3.1	2																							
Section   Column	Dec 28-Dec-11	7.16	257.3 253.4	12.14	702	350 342	11.58	6.4	28.32					No.									na name			1000000			1									the state of
Section   Column	Dec 30-Dec-16 Dec 31-Dec-16	7.53 7.81	251.4 215.5	11,92	678	339	1.0		27.15							Parameter State																						
Section   1.5	Jan 01-Jan-19	8.08	100.7	14.63	672	333	1.9	6.1	27.8		<1.8	14.2	0.11	<3.1	- 2	<0.002		10 002	#0.01	€ 002	10,002	<b>40</b> ,01	40.002	0	2	0.008	€ 002	0.02	0.008	<0.005	<0.1	0.024 0.0	0.0	78 <0.02	<0.05	1,352	0.1	<0.1
Section   Sect	Jan 03-Jan-19 Jan 04-Jan-19	7.83	236.7	14.02	005	326	14	6.1	27.14							-						1111								100				200				
15-48-16   2-66   114   17-66   653   315   2   18-85   18-8	Jan 05-Jan-10	8.05	174.0	14.00	621	310	2.3	9.3	26.41																0												No.	
15-48-16   2-66   114   17-66   653   315   2   18-85   18-8	Jan 08-Jan-10 Jan 09-Jan-10	8.03	195.6	12.05	011	321 305	1.8	7 73	28.48	0.4	<1.8	13.1	0.11	<31	4																							
15-48-16   2-66   114   17-66   653   315   2   18-85   18-8	Jan 10-Jan-10 Jan 11-Jan-10	8 15 7.91	120.5	12.48 12.01	670	319	2.2 1.8	10.6	27.64 28.07			2.0																										
Ann   14-Jan-10   A.15   172.8   172.4   775   300   15   115   200     Ann   15-Jan-10   A.15   172.8   172.4   775   300   15   115   200     Ann   15-Jan-10   A.15   172.8   172.8   172.8   172.8   172.8     Ann   Ann-10   Ann   Ann-10   Ann   Ann-10     Ann   Ann-10   Ann   Ann-10   Ann   Ann-10     Ann   Ann-10   Ann   Ann-10   Ann   Ann-10     Ann   Ann-10   Ann   Ann-10     Ann   Ann-10   Ann   Ann-10     Ann   Ann-10   Ann-	Jan 12-Jan-10 Jan 13-Jan-10	7.14	174.5	12.00	634	320	2 2		28.26														- 5															
Jan   10-Jan-10   7,01   240,5   14,36   727   420   2,4   727,93	Jan 14-Jan-19 Jan 15-Jan-19	8.15	123.5	12.04	718	350	4.3	10.9	29.09	161	21.5	410	0.222	-31	2																							
Jan   10-Jan-10   7,01   240,5   14,36   277   40,00   13,45   277   40,00   24,48   27,78   27,98   23,28   24,48	Jan 16-Jan-10 Jan 17-Jan-10	8.03	77.3	13.91	724 702	362	1.5	13.6	27.23	1.01	N1.8	711.2	0.233	-41	-																							
Jan 2-Jan-19 8.04 136.3 13.9 701 351 2 7.8 27.75 159 41.8 12.4 0.212 43.1 4  Jan 2-Jan-19 7.92 128.6 11.65 636 528 8 11 26.3 3  Jan 2-Jan-19 7.80 142.6 11.98 711 356 22 10.0 27.60  Jan 2-Jan-19 7.80 142.6 11.98 711 356 22 10.0 27.60  Jan 2-Jan-19 8.85 231.6 13.93 755 378 2 2 77.70  Jan 2-Jan-19 8.85 231.6 13.93 755 378 2 2 77.70  Jan 2-Jan-19 8.85 231.6 13.93 755 378 2 0 77.70  Jan 2-Jan-19 8.85 231.6 13.93 755 378 2 0 77.70  Jan 2-Jan-19 8.85 231.6 13.93 755 378 2 0 77.70  Jan 3-Jan-19 8.87 2-Jan-19 8.87 2-Jan-19 8.88 27.74 0.95 41.8 13.2 0.215 43.1 0  Jan 3-Jan-19 8.07 2.04.4 10.61 854 427 2 9.8 27.74 0.95 41.8 13.2 0.215 43.1 0  Jan 3-Jan-19 8.06 290.7 12.96 803 446 16 10.1 27.42  Jan 3-Jan-19 8.06 290.7 12.96 803 446 16 10.1 27.46	Jan 19-Jan-11 Jan 20-Jan-11	7.83	255.9	13.45	727	343	1.7		27.93																													- N- 3
Jan 2-Jan-19 8.04 136.3 13.9 701 351 2 7.8 27.75 159 41.8 12.4 0.212 43.1 4  Jan 2-Jan-19 7.92 128.6 11.65 636 528 8 11 26.3 3  Jan 2-Jan-19 7.80 142.6 11.98 711 356 22 10.0 27.60  Jan 2-Jan-19 7.80 142.6 11.98 711 356 22 10.0 27.60  Jan 2-Jan-19 8.85 231.6 13.93 755 378 2 2 77.70  Jan 2-Jan-19 8.85 231.6 13.93 755 378 2 2 77.70  Jan 2-Jan-19 8.85 231.6 13.93 755 378 2 0 77.70  Jan 2-Jan-19 8.85 231.6 13.93 755 378 2 0 77.70  Jan 2-Jan-19 8.85 231.6 13.93 755 378 2 0 77.70  Jan 3-Jan-19 8.87 2-Jan-19 8.88 2-Jan-19	Jan 21-Jan-11 Jan 22-Jan-1	8.06 7.08	103.3	13.13	695 701	347 351	14.8	19.7	28.56 27.84																													
Jan 26-Jan-19 7,94 221.7 11.97 706 353 1.7 29.52  Jan 28-Jan-19 7.88 134.7 13.74 674 352 2.8 10.6 28.29  Jan 29-Jan-19 8.62 128.4 13.21 767 384 1.4 10 27.42  Jan 31-Jan-19 8.07 28.4 1.4 10 27.42  Jan 31-Jan-19 8.06 29.77 12.8 8093 446 1.6 10.1 27.46  Jan 31-Jan-19 8.06 29.77 12.8 8093 446 1.6 10.1 27.46  Jan 31-Jan-19 8.06 29.77 12.8 8093 446 1.6 10.1 27.46	Jan 23-Jan-11 Jan 24-Jan-11	8.04 7.92	135.3 128.6	13.0	701 686	351		7.5	27.75 26.43	1.50	<1.8	12.4	0.212	<3.1	4.																							
Jan   26-Jan-19   7.88   134.7   13.74   674   352   2.6   10.6   28.29     Jan   20-Jan-19   8.07   28.4   10.61   854   427   2   9.8   27.74   0.95   41.8   13.2   0.215     Jan   31-Jan-19   8.06   280.7   12.36   893   446   1.6   10.1   27.46     Jan   31-Jan-19   8.06   280.7   12.36   893   446   1.6   10.1   27.46     Jan   31-Jan-19   8.06   280.7   12.34   646   1.6   10.1   27.46     Jan   31-Jan-19   8.06   280.7   12.34   646   1.6   10.1   27.46     Jan   31-Jan-19   8.06   280.7   12.34   646   1.6   10.1   27.46     Jan   31-Jan-19   8.06   280.7   12.34   646   1.6   10.1   27.46     Jan   31-Jan-19   8.06   280.7   12.34   646   1.6   10.1   27.46     Jan   31-Jan-19   8.06   280.7   12.34   646   1.6   10.1   27.46     Jan   31-Jan-19   8.06   280.7   12.34   646   1.6   10.1   27.46     Jan   31-Jan-19   8.06   280.7   12.34   646   1.6   10.1   27.46     Jan   31-Jan-19   8.06   280.7   12.34   646   1.6   10.1   27.46     Jan   31-Jan-19   8.06   280.7   12.34   646   1.6   10.1   27.46     Jan   31-Jan-19   8.06   280.7   12.34   646   1.6   10.1   27.46     Jan   31-Jan-19   8.06   280.7   12.34   646   1.6   10.1   27.46     Jan   31-Jan-19   8.06   280.7   12.34   646   1.6   10.1   27.46     Jan   31-Jan-19   8.06   280.7   12.34   646   1.6   10.1   27.46     Jan   31-Jan-19   8.06   280.7   12.34   646   1.6   10.1   27.46     Jan   31-Jan-19   8.06   280.7   12.34   10.6   10.1   27.46     Jan   31-Jan-19   8.06   8.06   8.06   8.06   10.1   10.	Jan 20-Jan-1	7.94	221.7	11.07	711	358	1.7	10.0	27.60	10000				A THE RES								CVI I					TEN COL							-				
Feb (1)-Feb (1)-Feb (275 1134 010 460 12 118 2742	Jan 28-Jan-11	7.88	134.7	13.74	765 674	378 352	2.0	10.6	28.29					-																								
Feb (1)-Feb (1)-Feb (275 1134 010 460 12 118 2742	Jan 30-Jan-1	8.07	236.4	10.01	854	427 446	2	9.8	27.74	0.95	<1.8	13.2	0.215	43.1	4	3																						
Feb 03-Feb-19 7.8 250.9 11.2 693 438 2.2 24.18 Feb 04-Feb-19 7.95 296.3 11.94 856 428 1.7 11.8 28.15	Eeb 01-Eeb-1	7.06	227.5	11.34	910 898	460	1.2		27.42													-					1											1000
	Feb 03-Feb-1	7.8	250.9 296.3	11.2	803 856	438 428	1.7	11.8	24.18 28.15																													

Monitoring Parameters Result for STP(Phase-2)

Date	pH	0	ORP	DO	EC	TDS	Turbidity	COD	Temp	800	T-Coli	T-N	T.P	O&G	55	Cyanide	Total Cyanide	Chromium	Arsenic	Mercury	Cadmium	Selenium	Lead	Color	Odor	Zine	Copper	Barium	Nickel	Sulphide	Free Chlorine	Formal- dehyde Silve	r tron		Hexavalent Chromium (Cr6+)	Fluoride	Total Chiorine	Phe
		-			Daily Pa	arameters			_		_	Weekly F	Parameters										_	_		Monthly	Parameters											_
ardell -	1-1	_	W-15	100		Max 2,000		Max 125	Mer 31	Max 30	Max 400	Max 80	Mar 2	Max 10	Mar 80	MAY 0.1		MAX 6.5	Maraj	Max 5.000	Mar 6.63	Mar & th	Max 6.1		Max 150	Max 2		Max 1					IN CHAPTER	Mag 10	Marci	Mayou	Max0.2	<b>247</b>
Unit 05-Feb-19	7.54		81.4	mg/L 12.54	ps/cm		FNU	ppm 14.1	*C	ppen	MNP/100ml	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm			ppm	ppm	ppm	ppm	ppm	ppm	ppm ppm	ppm	ppm	ppm	ppm	ppm	P
06-Feb-19	7.40	3.	22.8	11.24	993 884	490 472	4.5 2.2 4.6	14.1	28.3 28.27 28.66	0.95	41.8	15.0	0.417	<3.1	2	0.003	0.008	±0.002	10.01	€ 002	±0.002	±0.01	10.002	3.72	1.4	-0.002	±0.002	0.01	0.008	<0.005	0.1	0.023 -0.002	0.17	0.292	40.05	2.509	0.2	140
07-Feb-19	8.12	1.	51,4	11.22	1027	513	4.6	14.3	28.66		4								ALC: N																			
08-Feb-19 09-Feb-19	7.68		20.2	13.13	985 1010	492	11.8	14.7	28.94	4		-					-			-	-	-				-	-											4
10-Feb-19			91.1	11.42		928	5	1000	20 13 27.04										1	100	-						1000					-						
11-Feb-19	7.96	1	74.8	12.37	655 1058	527 533	5.6 2.5 3.4	12.6	26.79																													
12-Feb-19			68.7	11.82	1067	533	2.5	-	26.89			-	The same															-	-			100					The same of	
13-Feb-19 14-Feb-19	7.92		22.1 94.7	6.01	1051	528 445	4.5	12.2	28.98	1.29	41.8	12.9	0.964	<3.1	- 2		_										_				_		4					-
15-Feb-10	0 6.74		00.0	8.17	809	404	7.3	12.2 22.5 15.6	29.21																													
16-Feb-10	0.78		119	6.52	739	370 320	11.0		29.21 29.3 29.6								A STATE OF							-		1			100		-				A PROPERTY AND ADDRESS OF		- O	
17-Feb-19	0.57		50.9	4.5	640	320	2	10.5	29.6				HOLESON.				- 01		20											Section 1			4					4
18-Feb-19 19-Feb-19			71.5	4.12 8.05	705	350	8.5	10.2	28.76 29.26 29.15 29.08		-	-				_									_		1											
19-Feb-19 20-Feb-19	6.77	1	74.7	4.52	685 763	352 342 381	29.7	13.5	29.15	0.17	<1.8	13.2	0.530	<3.1	2																							
21-Feb-19	0.89		07.5	5.57	763	381	2.3	11.5	29.08		1																											
22-Feb-19			11.7	5.25	843	421	21.5	12.3	29.12								-			-																		4
23-Feb-19 24-Feb-19	9 6.29		89.2	52 4.03	852	420 378	7.6		29 22 29 31							-	1			-					_		THE RESERVE			-								400
25-Feb-19			07.5	4.52	763	381	8.5	23.4	29.26																											all a second		45
26-Feb-19	0 0.74		7	88	678	381 365 477	2.8	20.3	29.26 29.17 29.55 29.65	1			- 11711												1									4				
27-Feb-19			104	0.49 3.85	954 1030	515	5.4	17.2	29.55	1.1	<1.8	12.4	0.510	<3.1	2														1 = =									4
28-Feb-19 01-Mar-19			67.1	2.61	782	301	3.2	18.0				-					-																_					-
02-Mar-19			54.4	3.41	654	259	2.0	14.0	27.29	1000			and the second			Here Here	Haller III								A COLUMN TO A STATE OF THE PARTY OF THE PART	All and the same		THE REAL PROPERTY.	No. of Concession, Name of Street, or other Designation, Name of Street, Name	MALL OF STREET	State of the last		STATE OF THE PARTY.		IIIIII	A STATE OF THE PARTY OF THE PAR	and the same of	
03-Mar-19	0 7.12	2	47.1	3.41 5.20	663	259 340 354	37		27.29 28.24	a diamental	State of the							Transfer of the Park					1	1									ati Maranii					
34-Mar-19			232	2.94	708 785	354	2.1	16.9	28.72														_															4
05-Mar-19 06-Mar-19	9 6.64	2	10.9	3.74	653	302 420	5.5 2.5 2.6 14.3	14.2	28.72 28.91 29.24 29.47	11	<1.8	10.3	0.271	<31	4	0.002	0.008	≠0.002	10.01	-0.002	+0.002	0.01	±0 002	3.47	1	:0.002	+0.002	0.01	0.012	<0.005	0.4	0.025 40.002	0.126	2.1	<0.05	1.472	0.4	-
7-Mar-19	0 6.72		70.4	4.36 3.67	888	420 444 494	2.0	22.8	29.47			10.0		753		227	31888	17,075	-				158.578	0.71		20.00		4.00.1	W.W.14	70.000	7.7	0.020 10.002	9,440		19,99	1412	4.4	
21-1aM-80	65.0		34.4	3.03	989	494		23.1	20.06		No.																											
G-Mar-10	0 6.00		32.4	1.07	1015	507	20.1 42.5		29.76 27.11													-	-	-				-		All III	- 010						- CT   112	4
10-Mar-19	0 7.08		90.5	2.94	705	354	14.5	23	28.51									-	1						1					1						-		
12-Mar-10	0 6.75	0	89.5	0.31	856	428	1.85	15	29.50																			= 0										
13-Mar-10			79.1	2.41 3.26	818	489 422	23.2 3.6 2.9	13.2	20.50 29.32 29.28 30.01	1.71	<1.8	15.2	0.979	<3.1	4																				4			4
14-Mar-10 15-Mar-10	0 6.00		01.2 53.7	3.26	842 912	456	2.0	14.3	29.28		-	-				-	_																4	-				4
16-Mar-19			77.6	1.36	1027	514	35.4	10.0	20.07	-	The same of		-		1 1	Total Control		100	Partition of	THE RESERVE	The same of			1	Commence of the last		and the same		-	110000	-	and the same	ALC: UNKNOWN	-	S S Comment	-	No. of Concession, Name of Street, or other Persons, Name of Street, or ot	40
17-Mar-19	0 6.0		37.2	1.9	928	436	0.5		26.4		I CONTRACTOR																	1					10000014			100	issue in	
18-Mar-19			40.0	2.8	874	437	6.5	17.2	28.25	1.86	<1.8	14.3	0.413	41	- 4																							4
10-Mar-10			132.0	3.75 0.51	842 979	412	47.2	12.4	30.41	1.00	11.0	14.3	0.413	-3.1		No. of Concession, Name of Street, or other Designation, Name of Street, Name	1	The Real Property lies			1000		151		1		-		-	HI STATE OF THE PARTY OF THE PA		-						460
21-Mar-19			07.5	3.58	Q52	476	50.6	10	30.19																					1111								
22-Mar-10	7.15	1	102.1	2.51	964	482	3	13	31.27																		1										112	
23-Mar-19			17.5	1.58	1053	527	2.0		30,13 30,43 30,6 30,13																100													
24-Mar-19 25-Mar-19	0 7.23		74	3.61	1016	558	122	23.7	30.9																	100		19		-								
26-Mar-16	0 6.95	1	25.4	3	1225	612	12.2	23.7	30.13	0.34	<1.B	11.0	0.31	+3.1	2							Section 1								hr								
27-Mar-19	0 7.34		43.2	2.5	778	470	5.7		30.42 30.25	2000		1	The state of the s	100												1000			Company of the last	Million To			G THE W		100	Contract Con	12 III III	
28-Mar-11	9 6.87	1	107.3	4.38	1201	600	27.0	22.3	30.25		1		_															-										4
29-Mar-19	9 7.2		99.2	3.00	1198	500	3.5	20.4	30.19	No. of Concession, Name of Street, or other Designation, or other	-	APRIL DE		STATE OF THE PERSON NAMED IN	-	-	The same	C 1004	APPLE TO SERVICE AND ADDRESS OF THE PARTY OF	1000	STATE OF THE PARTY.			in the second	Section Section 1	The same of	THE REAL PROPERTY.	THE REAL PROPERTY.	THE COURSE OF	THE PERSON NAMED IN	-	The state of the s			The state of the s	The state of the s	-	
Continue 1	0 727		167.5	3.55	1188	503	3.9	70000	30.2		100							A District		The state of the s				271				minimum at	1	-	-						-	



## **End of Document**

