

ภาคผนวก ง

ใบรับรองผลการตรวจวัดคุณภาพสิ่งแวดล้อม

## ใบรับรองผลการตรวจวัดคุณภาพอากาศในบรรยากาศ



บริษัท ซีคอต จำกัด  
SECOT CO., LTD.

239 ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพฯ 10800

239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND

TEL : +66(0) 2959-3600 FAX : +66(0) 2959-3535 E-mail : envserv@secot.co.th

AMBIENT AIR QUALITY ANALYSIS REPORT

CLIENT NAME : Star Petroleum Refining Public Co., Ltd. REF. NO. : SPRC-223003-COA-Amb/TSP  
SAMPLING BY : SECOT Co., Ltd. SAMPLING DATE : 04-12/12/2023  
RECEIVED DATE : 14/12/2023 ANALYTICAL DATE : 16-19/12/2023  
REPORT DATE : 19/12/2023 SAMPLE CONDITION : Normal  
OPERATOR : Mr.Siwanon Kulawong  
STATION DESCRIPTION : 1. Within the Refinery Plant 2. Map Ta Phut New Town  
3. Ban Plong Community

PARAMETER	SAMPLING DATE	UNITS	RESULTS			STANDARD*	REFERENCE METHODS
			1	2	3		
TSP (24 hr.)	04-05/12/2023	mg/m <sup>3</sup>	0.035	0.031	0.046	0.330	High Volume
	05-06/12/2023	mg/m <sup>3</sup>	<sup>1/</sup>	0.044	0.056		Air Sampler/
	06-07/12/2023	mg/m <sup>3</sup>	0.051	0.075	0.068		Gravimetric
	07-08/12/2023	mg/m <sup>3</sup>	0.040	0.043	0.056		Method
	08-09/12/2023	mg/m <sup>3</sup>	0.058	0.058	0.077		
	09-10/12/2023	mg/m <sup>3</sup>	0.081	0.069	0.086		
	10-11/12/2023	mg/m <sup>3</sup>	0.067	0.063	0.081		
	11-12/12/2023	mg/m <sup>3</sup>	0.072	-	-		

Phatchara Samanchan

(Miss Phatchara Samanchan)

Analyst

Narisa Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

Remark : 1. Reported analysis refers to submitted sample only.

2. This report shall not be reproduced, except in full, without official approval.

3. \* Notification of the National Environment Board, No.24, B.E.2547.

4. <sup>1/</sup> The power outage within the Refinery Plant during December 5-6, 2023.



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AMBIENT AIR QUALITY ANALYSIS REPORT

CLIENT NAME : Star Petroleum Refining Public Co., Ltd. REF. NO. : SPRC-222003-COA-Amb/PM10  
SAMPLING BY : SECOT Co., Ltd. SAMPLING DATE : 04-12/12/2023  
RECEIVED DATE : 14/12/2023 ANALYTICAL DATE : 16-19/12/2023  
REPORT DATE : 19/12/2023 SAMPLE CONDITION : Normal  
OPERATOR : Mr.Siwanon Kulawong  
STATION DESCRIPTION : 1. Within the Refinery Plant 2. Map Ta Phut New Town  
3. Ban Plong Community

PARAMETER	SAMPLING DATE	UNITS	RESULTS			STANDARD*	REFERENCE METHODS
			1	2	3		
PM-10 (24 hr.)	04-05/12/2023	mg/m <sup>3</sup>	0.023	0.013	0.035	0.120	High Volume
	05-06/12/2023	mg/m <sup>3</sup>	<sup>1/</sup>	0.018	0.034		Air Sampler
	06-07/12/2023	mg/m <sup>3</sup>	0.034	0.059	0.046		(Hi-Vol PM-10
	07-08/12/2023	mg/m <sup>3</sup>	0.025	0.034	0.020		Size Selective Inlet)
	08-09/12/2023	mg/m <sup>3</sup>	0.033	0.041	0.007		Gravimetric
	09-10/12/2023	mg/m <sup>3</sup>	0.047	0.055	0.061		Method
	10-11/12/2023	mg/m <sup>3</sup>	0.038	0.053	0.056		
	11-12/12/2023	mg/m <sup>3</sup>	0.061	-	-		

Phatchara Saman chan

(Miss Phatchara Samanchan)

Analyst

Narisa Poowasanpetch

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AMBIENT AIR QUALITY ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REFERENCE NO.	: SPRC-222303-COA-Amb/H <sub>2</sub> S
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING DATE	: 08-10/12/2023
RECEIVE DATE	: 14/12/2023	ANALYTICAL DATE	: 15/12/2023
REPORT DATE	: 02/01/2024	SAMPLE CONDITION	: Normal
INSTRUMENT	: Impingment Absorption	SITE OPERATOR	: Mr.Siwanon Kulawong
CALIBRATOR MODEL	: Defender 520-H	SERIAL NO.	: 114069
STATION DESCRIPTION	: 1. Within the Refinery Plant 2. Map Ta Phut New Town 3. Ban Plong Community		

PARAMETER	SAMPLING DATE	UNIT	ND (Non-detectable)	RESULTS			REFERENCE METHODS
				1	2	3	
Hydrogen Sulfide (1 hr)	08/12/2023	ppm	<0.001	0.003	0.003	0.003	Intersociety Committee
	09/12/2023	ppm	<0.001	0.003	0.003	0.003	Method 701
	10/12/2023	ppm	<0.001	0.002	0.002	0.002	

*Phatchara Samanchan*

(Miss Phatchara Samanchan)

Analyst

*Narisa Poowasanpetch*

(Miss Narisa Poowasanpetch)

Technical Management Team

**Remark :** 1. Reported analysis refers to submitted sample only.

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## Ambient Air Monitoring Results : Sulfur dioxide

### MTR-SPRC PLC-Refinery

Location : With in Refinery Plant, North

Monitor Period : 04-12 Dec 2023

Analyzer Model : API 100A

Station No : SS2-20

Serial No : 1715

Site Operator : Mr. Siwanon Kulawong

Calibrator Model : Teledyne 700E

Serial No : 587

Calibration Gas Cylinder I.D.: EB0108319


Certified Date : 09 Jan 2023

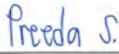
Cal Concentration (ppb) : 0,100,200,400

Expire Date : 08 Jan 2024

Time	SO2 Concentration (ppb)						
	04-05 Dec 2023	06-07 Dec 2023	07-08 Dec 2023	08-09 Dec 2023	09-10 Dec 2023	10-11 Dec 2023	11-12 Dec 2023
11:00 - 12:00	7.8	6.7	6.4	5.1	5.8	5.1	6.0
12:00 - 13:00	6.3	1.1	7.3	4.9	6.8	5.2	6.4
13:00 - 14:00	6.7	10.5	8.2	17.7	5.2	6.2	14.6
14:00 - 15:00	6.5	6.8	8.7	11.3	10.7	15.5	15.6
15:00 - 16:00	8.3	6.4	7.7	11.1	14.7	19.7	11.8
16:00 - 17:00	5.0	8.5	5.4	10.8	10.7	11.9	5.0
17:00 - 18:00	5.8	7.7	6.7	6.6	9.8	15.6	5.0
18:00 - 19:00	7.8	7.0	6.7	5.9	6.5	9.6	6.8
19:00 - 20:00	6.1	4.8	6.1	5.2	7.3	6.5	4.5
20:00 - 21:00	7.4	7.0	4.7	6.7	4.8	4.8	4.4
21:00 - 22:00	7.1	5.9	5.6	7.1	6.6	5.6	4.9
22:00 - 23:00	6.9	6.4	5.7	4.9	6.3	6.8	5.2
23:00 - 00:00	6.8	6.4	6.3	5.7	5.0	4.2	4.7
00:00 - 01:00	6.2	5.8	5.3	6.6	9.1	5.6	4.6
01:00 - 02:00	6.2	5.7	7.5	7.3	6.0	5.5	6.2
02:00 - 03:00	6.4	7.0	7.2	6.7	5.9	6.9	6.1
03:00 - 04:00	6.7	5.6	7.1	6.9	8.3	5.5	6.5
04:00 - 05:00	5.8	8.8	7.0	6.5	6.0	6.1	6.1
05:00 - 06:00	8.1	7.8	5.9	8.0	6.1	6.6	8.3
06:00 - 07:00	7.7	8.3	6.0	10.6	7.3	5.1	6.9
07:00 - 08:00	6.6	4.5	5.3	8.5	7.8	9.0	6.8
08:00 - 09:00	5.8	6.5	6.4	5.7	6.7	6.5	7.5
09:00 - 10:00	7.6	5.5	4.7	5.7	4.8	4.4	6.4
10:00 - 11:00	7.4	6.7	7.5	7.9	6.3	5.4	4.2
Average-24Hr*	6.8	6.6	6.5	7.6	7.3	7.6	6.9
Max-1Hr	8.3	10.5	8.7	17.7	14.7	19.7	15.6
Min-1Hr	5.0	1.1	4.7	4.9	4.8	4.2	4.2
Standard-1Hr	300 ppb(780 ug/cu.m)						
Standard-24Hr	120 ppb(300 ug/cu.m)						

Remark : \* Average time between 11:00-11:00

  
 (Miss Katesarin Vorradetwittaya)  
 Environmental Scientist

  
 (Miss Preeda Somjai)  
 Technical Management Team



## Ambient Air Monitoring Results : Sulfur dioxide

### MTR-SPRC PLC-Refinery

Location : Map Ta Phut New Town

Monitor Period : 04-11 Dec 2023

Analyzer Model : Teledyne 100A

Station No : SS2-09

Serial No : 2009

Site Operator : Mr. Siwanon Kulawong

Calibrator Model : Teledyne 700E

Serial No : 587

Calibration Gas Cylinder I.D.: EB0108319

Certified Date : 09 Jan 2023

Cal Concentration (ppb) : 0,100,200,400

Expire Date : 08 Jan 2024

Time	SO2 Concentration (ppb)						
	04-05 Dec 2023	05-06 Dec 2023	06-07 Dec 2023	07-08 Dec 2023	08-09 Dec 2023	09-10 Dec 2023	10-11 Dec 2023
12:00 - 13:00	6.8	5.0	3.5	4.6	5.3	4.7	3.7
13:00 - 14:00	4.2	6.3	5.5	3.1	5.3	5.2	5.2
14:00 - 15:00	6.8	10.0	10.5	4.8	16.0	5.6	7.0
15:00 - 16:00	5.2	7.9	5.0	5.5	10.6	8.0	11.9
16:00 - 17:00	5.9	4.8	7.3	3.8	7.7	12.9	18.7
17:00 - 18:00	4.8	6.2	5.0	4.1	8.4	10.0	8.4
18:00 - 19:00	6.7	4.2	4.5	5.7	5.8	7.2	12.7
19:00 - 20:00	4.6	4.8	4.2	3.0	4.3	4.0	9.0
20:00 - 21:00	4.6	7.2	4.4	4.2	6.4	5.3	5.5
21:00 - 22:00	5.8	7.8	4.4	5.7	5.5	2.6	3.7
22:00 - 23:00	6.8	6.9	6.3	5.6	4.0	4.7	5.3
23:00 - 00:00	5.3	5.8	3.9	4.2	5.6	4.7	4.9
00:00 - 01:00	4.5	5.2	5.0	3.4	4.9	3.4	2.9
01:00 - 02:00	5.0	7.4	5.0	3.2	3.5	6.1	4.8
02:00 - 03:00	7.2	6.1	4.1	3.7	5.6	3.9	2.6
03:00 - 04:00	5.1	4.6	5.3	5.4	4.9	5.4	3.1
04:00 - 05:00	3.9	4.8	4.9	3.3	6.1	5.8	4.3
05:00 - 06:00	5.7	6.9	6.9	4.6	6.5	5.8	3.7
06:00 - 07:00	6.7	8.2	6.9	4.9	6.0	6.2	3.3
07:00 - 08:00	6.5	8.3	4.5	4.4	7.7	6.7	4.5
08:00 - 09:00	4.2	6.2	5.2	5.9	5.9	5.4	7.1
09:00 - 10:00	6.9	3.8	4.9	4.5	5.1	3.7	4.5
10:00 - 11:00	5.8	6.2	4.4	5.3	6.6	2.7	4.0
11:00 - 12:00	4.6	3.9	5.2	4.5	5.2	4.3	5.1
Average-24Hr*	5.6	6.2	5.3	4.5	6.4	5.6	6.1
Max-1Hr	7.2	10.0	10.5	5.9	16.0	12.9	18.7
Min-1Hr	3.9	3.8	3.5	3.0	3.5	2.6	2.6
Standard-1Hr	300 ppb(780 ug/cu.m)						
Standard-24Hr	120 ppb(300 ug/cu.m)						

Remark : \* Average time between 12:00-12:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team





## Ambient Air Monitoring Results : Sulfur dioxide

### MTR-SPRC PLC-Refinery

Location : Ban Plong Community

Monitor Period : 04-11 Dec 2023

Analyzer Model : API 100A

Station No : SS2-08

Serial No : 377

Site Operator : Mr. Siwanon Kulawong

Calibrator Model : Teledyne 700E

Serial No : 587

Calibration Gas Cylinder I.D.: EB0108319

Certified Date : 09 Jan 2023

Cal Concentration (ppb) : 0,100,200,400

Expire Date : 08 Jan 2024

Time	SO2 Concentration (ppb)						
	04-05 Dec 2023	05-06 Dec 2023	06-07 Dec 2023	07-08 Dec 2023	08-09 Dec 2023	09-10 Dec 2023	10-11 Dec 2023
11:00 - 12:00	4.5	4.7	4.6	4.3	4.3	5.5	5.3
12:00 - 13:00	5.4	5.2	4.6	4.9	5.1	5.6	4.8
13:00 - 14:00	4.8	5.5	4.9	4.6	4.3	5.5	4.4
14:00 - 15:00	4.0	5.7	5.4	4.3	5.2	4.1	4.5
15:00 - 16:00	4.6	4.9	4.7	4.7	4.6	7.4	4.9
16:00 - 17:00	5.2	5.4	4.4	4.5	4.6	5.1	6.3
17:00 - 18:00	4.6	4.9	5.4	4.0	5.3	4.2	7.5
18:00 - 19:00	4.8	4.6	4.6	4.0	4.7	5.6	6.5
19:00 - 20:00	7.7	4.7	4.6	5.0	4.5	4.2	5.4
20:00 - 21:00	6.7	5.0	4.5	5.1	4.7	4.7	5.9
21:00 - 22:00	5.9	4.5	5.7	5.7	4.5	4.8	4.7
22:00 - 23:00	5.4	5.9	4.8	4.3	4.4	5.5	5.4
23:00 - 00:00	4.8	5.6	4.3	5.5	5.5	4.6	5.2
00:00 - 01:00	4.8	5.4	4.7	5.6	4.6	4.5	4.0
01:00 - 02:00	5.1	4.7	4.3	5.5	4.2	4.6	5.0
02:00 - 03:00	4.9	5.3	5.1	5.2	5.4	4.9	5.5
03:00 - 04:00	4.9	5.8	5.3	5.7	5.0	5.6	3.7
04:00 - 05:00	5.5	5.3	4.7	5.0	5.4	5.1	5.3
05:00 - 06:00	4.5	4.8	5.6	5.3	4.7	5.0	4.4
06:00 - 07:00	4.5	5.8	5.3	5.2	4.4	4.6	4.2
07:00 - 08:00	6.4	5.2	5.7	6.0	5.7	4.7	5.1
08:00 - 09:00	5.4	6.0	5.4	5.5	5.2	4.5	6.4
09:00 - 10:00	4.8	4.4	4.4	5.7	5.8	4.9	6.3
10:00 - 11:00	5.3	5.7	4.3	5.5	5.2	5.1	5.1
Average-24Hr*	5.2	5.2	4.9	5.0	4.9	5.0	5.2
Max-1Hr	7.7	6.0	5.7	6.0	5.8	7.4	7.5
Min-1Hr	4.0	4.4	4.3	4.0	4.2	4.1	3.7
Standard-1Hr	300 ppb(780 ug/cu.m)						
Standard-24Hr	120 ppb(300 ug/cu.m)						

Remark : \* Average time between 11:00-11:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team



## Ambient Air Monitoring Results : Nitrogen dioxide

### MTR-SPRC PLC-Refinery

Location : With in Refinery Plant, North

Monitor Period : 04-12 Dec 2023

Analyzer Model : API 200A

Station No : SS2-20

Serial No : 1528

Site Operator : Mr. Siwanon Kulawong

Calibrator Model : Teledyne 700E

Serial No : 587

Calibration Gas Cylinder I.D.: EB0108319

Certified Date : 09 Jan 2023

Cal Concentration (ppb) : 0,100,200,400

Expire Date : 08 Jan 2024

Time	NO2 Concentration (ppb)						
	04-05 Dec 2023	06-07 Dec 2023	07-08 Dec 2023	08-09 Dec 2023	09-10 Dec 2023	10-11 Dec 2023	11-12 Dec 2023
11:00 - 12:00	8.0	3.2	5.0	6.0	4.0	4.7	5.7
12:00 - 13:00	5.2	3.3	3.5	5.4	6.4	5.8	3.4
13:00 - 14:00	4.2	7.4	5.5	6.1	3.7	2.6	3.2
14:00 - 15:00	7.0	7.0	3.1	7.0	5.1	4.5	4.3
15:00 - 16:00	6.4	5.1	3.5	3.7	5.7	5.6	3.9
16:00 - 17:00	4.5	5.4	5.8	5.5	4.4	3.4	7.0
17:00 - 18:00	6.8	4.4	5.3	6.5	3.0	4.2	7.7
18:00 - 19:00	17.9	9.8	14.8	6.5	6.9	14.4	17.0
19:00 - 20:00	27.0	23.9	4.9	25.9	24.7	28.0	19.2
20:00 - 21:00	6.0	4.7	17.0	25.5	24.1	25.9	16.4
21:00 - 22:00	18.4	19.4	16.9	24.1	21.9	22.2	16.0
22:00 - 23:00	14.8	14.3	18.5	18.1	18.4	18.5	11.0
23:00 - 00:00	13.9	14.8	14.7	11.7	11.8	15.3	11.1
00:00 - 01:00	11.1	12.3	10.2	12.3	10.8	10.9	8.6
01:00 - 02:00	10.2	10.4	8.8	10.0	10.7	9.6	9.8
02:00 - 03:00	9.5	8.1	10.2	9.9	8.6	9.6	12.5
03:00 - 04:00	7.1	7.2	9.3	7.0	10.7	5.8	8.2
04:00 - 05:00	8.8	8.7	12.2	11.5	7.1	6.6	9.2
05:00 - 06:00	13.3	9.5	11.3	10.5	10.1	6.1	10.5
06:00 - 07:00	13.2	10.1	12.7	15.0	8.7	10.4	11.3
07:00 - 08:00	16.0	18.1	13.4	18.0	11.7	14.9	14.9
08:00 - 09:00	9.8	13.3	11.3	13.1	12.8	11.8	10.4
09:00 - 10:00	7.4	6.3	7.9	11.1	8.1	10.3	6.1
10:00 - 11:00	7.1	7.0	9.8	7.9	5.5	5.2	5.1
Average-24Hr*	10.6	9.7	9.8	11.6	10.2	10.7	9.7
Max-1Hr	27.0	23.9	18.5	25.9	24.7	28.0	19.2
Min-1Hr	4.2	3.2	3.1	3.7	3.0	2.6	3.2
Standard-1Hr	170 ppb(320 ug/cu.m)						
Standard-24Hr	-						

Remark : \* Average time between 11:00-11:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team



## Ambient Air Monitoring Results : Nitrogen dioxide

### MTR-SPRC PLC-Refinery

Location : Map Ta Phut New Town

Monitor Period : 04-11 Dec 2023

Analyzer Model : API 200A

Station No : SS2-09

Serial No : 1505

Site Operator : Mr. Siwanon Kulawong

Calibrator Model : Teledyne 700E

Serial No : 587

Calibration Gas Cylinder I.D.: EB0108319

Certified Date : 09 Jan 2023

Cal Concentration (ppb) : 0,100,200,400

Expire Date : 08 Jan 2024

Time	NO2 Concentration (ppb)						
	04-05 Dec 2023	05-06 Dec 2023	06-07 Dec 2023	07-08 Dec 2023	08-09 Dec 2023	09-10 Dec 2023	10-11 Dec 2023
12:00 - 13:00	6.6	6.6	7.8	4.6	7.7	5.6	5.7
13:00 - 14:00	4.7	5.8	4.6	4.5	5.8	5.6	6.6
14:00 - 15:00	8.7	4.6	7.3	6.1	5.6	6.3	3.3
15:00 - 16:00	8.3	4.7	7.8	7.7	9.8	7.9	7.0
16:00 - 17:00	9.6	6.2	8.4	7.2	7.5	7.6	3.5
17:00 - 18:00	8.4	8.7	12.6	8.6	13.1	2.2	8.1
18:00 - 19:00	9.8	7.7	11.1	7.8	2.1	12.2	9.8
19:00 - 20:00	5.7	5.4	8.7	4.8	9.8	12.1	8.4
20:00 - 21:00	8.4	9.8	2.2	6.5	9.4	11.6	10.3
21:00 - 22:00	6.3	2.6	9.2	7.4	5.4	12.3	11.3
22:00 - 23:00	2.8	10.6	12.0	3.5	7.6	16.3	11.2
23:00 - 00:00	4.3	9.9	9.7	6.9	9.1	11.7	8.6
00:00 - 01:00	2.9	11.2	10.5	6.3	9.7	12.4	9.5
01:00 - 02:00	5.0	2.6	2.8	3.8	2.3	2.9	2.7
02:00 - 03:00	7.1	11.5	5.5	8.5	8.5	4.5	6.5
03:00 - 04:00	7.8	6.2	6.5	3.8	5.7	5.2	6.9
04:00 - 05:00	8.3	6.6	8.2	6.5	8.0	4.4	4.5
05:00 - 06:00	8.6	7.4	4.3	6.0	8.8	6.7	3.2
06:00 - 07:00	9.6	8.5	6.7	3.7	7.3	6.1	5.5
07:00 - 08:00	8.4	10.2	4.3	6.5	6.2	9.0	5.3
08:00 - 09:00	5.0	8.7	5.1	5.8	6.2	8.8	4.3
09:00 - 10:00	7.7	5.9	7.1	5.4	7.7	6.6	8.6
10:00 - 11:00	8.2	5.8	2.7	5.3	11.3	5.7	5.6
11:00 - 12:00	4.6	7.8	5.1	4.6	6.5	3.8	5.4
Average-24Hr*	7.0	7.3	7.1	5.9	7.5	7.8	6.7
Max-1Hr	9.8	11.5	12.6	8.6	13.1	16.3	11.3
Min-1Hr	2.8	2.6	2.2	3.5	2.1	2.2	2.7
Standard-1Hr	170 ppb(320 ug/cu.m)						
Standard-24Hr	-						

Remark : \* Average time between 12:00-12:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team





## Ambient Air Monitoring Results : Nitrogen dioxide

### MTR-SPRC PLC-Refinery

Location : Ban Plong Community

Monitor Period : 04-11 Dec 2023

Analyzer Model : API 200AU

Station No : SS2-08

Serial No : 144

Site Operator : Mr. Siwanon Kulawong

Calibrator Model : Teledyne 700E

Serial No : 587

Calibration Gas Cylinder I.D.: EB0108319

Certified Date : 09 Jan 2023

Cal Concentration (ppb) : 0,100,200,400

Expire Date : 08 Jan 2024

Time	NO2 Concentration (ppb)						
	04-05 Dec 2023	05-06 Dec 2023	06-07 Dec 2023	07-08 Dec 2023	08-09 Dec 2023	09-10 Dec 2023	10-11 Dec 2023
11:00 - 12:00	6.5	5.3	6.5	2.2	8.0	4.5	6.7
12:00 - 13:00	6.6	4.9	4.8	5.8	1.8	4.4	3.7
13:00 - 14:00	6.8	7.5	6.2	2.1	8.2	4.7	4.6
14:00 - 15:00	9.3	7.8	4.8	11.4	10.2	4.5	8.4
15:00 - 16:00	13.4	3.9	9.3	9.9	14.4	8.0	11.1
16:00 - 17:00	2.3	12.0	10.6	9.2	14.7	9.8	7.6
17:00 - 18:00	10.0	8.8	10.4	9.4	14.4	8.6	13.1
18:00 - 19:00	10.7	6.9	9.5	7.3	16.3	16.1	15.7
19:00 - 20:00	12.1	5.9	6.6	8.9	10.4	8.7	9.1
20:00 - 21:00	8.9	5.9	5.6	6.8	10.0	10.6	6.1
21:00 - 22:00	7.1	8.2	7.1	7.1	6.1	6.5	7.1
22:00 - 23:00	5.2	3.6	4.2	7.2	7.8	8.7	8.0
23:00 - 00:00	4.5	5.0	7.6	8.6	4.6	7.5	3.6
00:00 - 01:00	5.6	5.2	7.0	5.6	4.6	6.0	4.5
01:00 - 02:00	10.9	5.7	8.7	6.8	3.4	4.4	2.7
02:00 - 03:00	6.3	4.3	9.8	8.2	4.1	5.5	7.5
03:00 - 04:00	8.2	6.5	7.3	8.0	7.4	9.2	7.1
04:00 - 05:00	7.9	9.5	7.4	8.5	7.2	8.5	10.5
05:00 - 06:00	6.9	9.6	9.7	8.9	7.3	10.6	9.7
06:00 - 07:00	9.1	10.7	17.3	8.3	11.7	6.7	6.9
07:00 - 08:00	7.4	10.0	8.3	9.1	8.9	7.3	9.7
08:00 - 09:00	5.0	8.6	9.0	9.9	6.4	8.4	8.3
09:00 - 10:00	5.8	7.0	4.5	7.2	5.6	5.1	1.9
10:00 - 11:00	8.9	6.9	4.1	7.4	5.3	4.5	4.6
Average-24Hr*	7.7	7.1	7.8	7.7	8.3	7.4	7.4
Max-1Hr	13.4	12.0	17.3	11.4	16.3	16.1	15.7
Min-1Hr	2.3	3.6	4.1	2.1	1.8	4.4	1.9
Standard-1Hr	170 ppb(320 ug/cu.m)						
Standard-24Hr	-						

Remark : \* Average time between 11:00-11:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team



## Ambient Air Monitoring Results : Carbon monoxide

### MTR-SPRC PLC-Refinery

Location : With in Refinery Plant, North

Monitor Period : 04-12 Dec 2023

Analyzer Model : API 300A

Station No : SS2-20

Serial No : 1343

Site Operator : Mr. Siwanon Kulawong

Calibrator Model : Teledyne 700E

Serial No : 587

Calibration Gas Cylinder I.D.: EB0108319

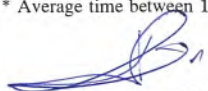
Certified Date : 09 Jan 2023


Cal Concentration (ppb) : 0,100,200,400

Expire Date : 08 Jan 2024

Time	CO Concentration (ppm)						
	04-05 Dec 2023	06-07 Dec 2023	07-08 Dec 2023	08-09 Dec 2023	09-10 Dec 2023	10-11 Dec 2023	11-12 Dec 2023
11:00 - 12:00	1.1	0.7	1.2	1.9	1.2	1.6	0.2
12:00 - 13:00	1.6	2.0	1.9	1.5	1.8	1.2	1.8
13:00 - 14:00	1.9	0.3	0.5	1.3	1.1	0.8	0.4
14:00 - 15:00	0.9	0.7	1.4	0.9	0.8	1.5	1.4
15:00 - 16:00	1.4	1.1	1.6	1.9	1.2	2.0	0.9
16:00 - 17:00	0.4	1.0	1.7	2.0	1.9	0.3	0.3
17:00 - 18:00	0.9	1.3	1.8	1.6	1.8	0.8	1.8
18:00 - 19:00	0.3	1.6	1.8	1.6	0.7	1.8	1.8
19:00 - 20:00	1.3	0.4	1.5	0.7	1.3	1.5	0.8
20:00 - 21:00	1.6	1.7	1.7	1.0	1.5	1.5	0.7
21:00 - 22:00	1.1	2.0	0.4	0.2	1.1	1.3	1.0
22:00 - 23:00	0.6	0.8	1.8	1.2	1.9	1.8	1.9
23:00 - 00:00	1.6	1.6	1.6	0.3	1.9	1.1	1.9
00:00 - 01:00	0.3	0.7	0.9	1.5	1.5	0.3	0.7
01:00 - 02:00	0.5	0.7	1.9	1.4	1.1	0.5	1.9
02:00 - 03:00	0.9	1.0	1.5	0.7	0.4	1.0	1.3
03:00 - 04:00	0.2	0.6	0.2	1.5	0.9	1.7	0.8
04:00 - 05:00	1.2	0.3	1.9	1.1	1.0	2.0	1.5
05:00 - 06:00	1.7	1.5	2.0	1.4	0.2	0.9	0.6
06:00 - 07:00	0.5	0.9	1.0	0.5	0.4	0.4	0.7
07:00 - 08:00	1.6	1.2	0.7	0.3	1.6	0.6	1.9
08:00 - 09:00	1.8	1.4	1.3	0.4	0.6	1.4	0.4
09:00 - 10:00	1.2	1.6	0.5	0.9	1.5	1.5	0.9
10:00 - 11:00	0.5	1.1	0.6	0.6	1.8	1.6	1.1
Average-24Hr*	1.0	1.1	1.3	1.1	1.2	1.2	1.1
Max-1Hr	1.9	2.0	2.0	2.0	1.9	2.0	1.9
Min-1Hr	0.2	0.3	0.2	0.2	0.2	0.3	0.2
Standard-1Hr	30 ppm(34.2 mg/cu.m)						
Standard-24Hr	-						

Remark : \* Average time between 11:00-11:00

  
(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

  
(Miss Preeda Somjai)  
Technical Management Team



## Ambient Air Monitoring Results : Carbon monoxide

### MTR-SPRC PLC-Refinery

Location : Map Ta Phut New Town

Monitor Period : 04-11 Dec 2023

Analyzer Model : API 300E

Station No : SS2-09

Serial No : 163-S

Site Operator : Mr. Siwanon Kulawong

Calibrator Model : Teledyne 700E

Serial No : 587

Calibration Gas Cylinder I.D.: EB0108319

Certified Date : 09 Jan 2023

Cal Concentration (ppb) : 0,100,200,400

Expire Date : 08 Jan 2024

Time	CO Concentration (ppm)						
	04-05 Dec 2023	05-06 Dec 2023	06-07 Dec 2023	07-08 Dec 2023	08-09 Dec 2023	09-10 Dec 2023	10-11 Dec 2023
12:00 - 13:00	0.6	1.4	1.4	1.4	0.2	1.1	0.4
13:00 - 14:00	0.7	1.4	0.4	0.3	0.8	0.2	0.8
14:00 - 15:00	1.0	0.4	0.7	0.4	0.8	1.4	1.3
15:00 - 16:00	1.1	0.6	0.7	0.8	1.3	1.3	0.4
16:00 - 17:00	0.3	0.8	0.3	0.9	1.5	0.2	0.7
17:00 - 18:00	0.4	1.1	0.3	0.8	0.2	0.4	1.5
18:00 - 19:00	0.3	0.7	0.3	0.6	1.2	0.3	0.7
19:00 - 20:00	1.2	0.8	0.6	0.3	0.5	0.4	1.0
20:00 - 21:00	0.8	0.6	1.4	0.4	1.2	0.6	0.7
21:00 - 22:00	0.3	0.8	0.4	0.5	1.3	1.4	0.7
22:00 - 23:00	0.3	0.6	0.4	0.3	0.7	1.0	1.1
23:00 - 00:00	1.0	0.9	1.0	0.8	0.7	1.2	0.5
00:00 - 01:00	1.4	1.1	0.7	1.0	0.5	0.4	0.5
01:00 - 02:00	1.3	1.4	1.5	0.4	1.3	1.5	0.9
02:00 - 03:00	0.3	0.3	1.2	0.3	0.7	0.6	0.4
03:00 - 04:00	0.8	0.9	1.0	1.2	1.5	1.3	1.2
04:00 - 05:00	0.3	0.5	0.7	0.7	1.2	0.7	0.8
05:00 - 06:00	1.4	0.5	0.8	0.8	0.3	1.1	0.2
06:00 - 07:00	0.4	0.6	1.1	0.9	1.1	0.7	0.6
07:00 - 08:00	1.2	0.7	0.6	0.6	0.5	0.5	1.0
08:00 - 09:00	0.5	0.7	1.0	1.0	0.9	1.2	1.0
09:00 - 10:00	0.3	1.2	0.8	0.7	1.5	0.6	0.8
10:00 - 11:00	0.6	1.0	1.5	0.6	1.0	1.4	0.8
11:00 - 12:00	0.8	0.5	0.4	0.4	1.2	0.8	1.4
Average-24Hr*	0.7	0.8	0.8	0.7	0.9	0.8	0.8
Max-1Hr	1.4	1.4	1.5	1.4	1.5	1.5	1.5
Min-1Hr	0.3	0.3	0.3	0.3	0.2	0.2	0.2
Standard-1Hr	30 ppm(34.2 mg/cu.m)						
Standard-24Hr	-						

Remark : \* Average time between 12:00-12:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team





## Ambient Air Monitoring Results : Carbon monoxide

### MTR-SPRC PLC-Refinery

Location : Ban Plong Community

Monitor Period : 04-11 Dec 2023

Analyzer Model : Teledyne 300E

Station No : SS2-08

Serial No : 924

Site Operator : Mr. Siwanon Kulawong

Calibrator Model : Teledyne 700E

Serial No : 587

Calibration Gas Cylinder I.D.: EB0108319

Certified Date : 09 Jan 2023

Cal Concentration (ppb) : 0,100,200,400

Expire Date : 08 Jan 2024

Time	CO Concentration (ppm)						
	04-05 Dec 2023	05-06 Dec 2023	06-07 Dec 2023	07-08 Dec 2023	08-09 Dec 2023	09-10 Dec 2023	10-11 Dec 2023
11:00 - 12:00	0.9	0.4	0.3	0.3	1.1	0.7	0.9
12:00 - 13:00	0.9	1.0	0.3	0.6	0.6	1.0	0.3
13:00 - 14:00	1.1	0.5	0.5	0.8	0.7	0.3	0.4
14:00 - 15:00	0.4	1.0	0.5	0.6	0.7	0.7	0.3
15:00 - 16:00	0.8	1.1	0.6	0.6	1.0	0.5	0.5
16:00 - 17:00	0.7	0.4	1.1	0.8	0.2	1.0	0.5
17:00 - 18:00	0.9	0.7	1.1	0.5	0.4	0.7	1.0
18:00 - 19:00	0.5	0.7	0.7	1.0	0.9	1.0	0.5
19:00 - 20:00	0.6	0.3	0.8	0.7	0.2	0.7	0.7
20:00 - 21:00	0.3	0.8	1.0	0.8	0.4	0.5	0.6
21:00 - 22:00	0.2	1.1	1.0	1.0	0.6	0.6	0.4
22:00 - 23:00	0.3	1.0	1.0	1.1	0.5	0.7	0.8
23:00 - 00:00	0.2	0.3	0.9	0.9	0.2	0.4	1.1
00:00 - 01:00	0.2	0.2	0.7	0.2	0.7	0.3	0.9
01:00 - 02:00	0.5	1.0	0.9	0.5	0.4	0.6	1.0
02:00 - 03:00	0.9	0.9	1.1	0.9	1.0	0.8	0.7
03:00 - 04:00	0.3	0.4	0.9	0.6	0.4	0.3	0.5
04:00 - 05:00	0.5	0.9	0.7	0.2	1.0	0.9	0.4
05:00 - 06:00	0.7	1.1	0.3	1.1	0.6	0.6	0.5
06:00 - 07:00	0.5	0.6	1.0	0.8	0.9	0.4	0.4
07:00 - 08:00	0.2	0.7	0.6	0.3	0.5	0.8	0.9
08:00 - 09:00	0.4	0.4	0.8	0.8	0.4	0.7	0.6
09:00 - 10:00	0.4	1.0	0.6	1.1	0.5	0.2	0.7
10:00 - 11:00	1.0	0.6	0.2	0.7	0.9	1.0	0.9
Average-24Hr*	0.6	0.7	0.7	0.7	0.6	0.6	0.6
Max-1Hr	1.1	1.1	1.1	1.1	1.1	1.0	1.1
Min-1Hr	0.2	0.2	0.2	0.2	0.2	0.2	0.3
Standard-1Hr	30 ppm(34.2 mg/cu.m)						
Standard-24Hr	-						

Remark : \* Average time between 11:00-11:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team



บริษัท ซีคอต จำกัด  
SECOT CO., LTD.

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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND

TEL. (662) 959-3600 FAX (662) 959-3535 Website : secot.co.th E-mail : envserv@secot.co.th

AMBIENT AIR QUALITY ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 1101/66
SAMPLING BY	: SECOT Co., Ltd .	SAMPLING METHOD	: Subatmospheric Pressure Sampling
SAMPLING DATE	: 03-04/07/2023	ANALYTICAL DATE	: 10, 13/07/2023
SAMPLING TIME	: 09:30-08:50	SAMPLE CONDITION	: Normal
RECEIVED DATE	: 05/07/2023	FILE CODE	: 223003_TO-15_July
REPORT DATE	: 15/07/2023		

Compound	Non Detection		SAMPLING LOCATION		STANDARD* (µg/m <sup>3</sup> )
			Map Ta Phut New Town		
	ppbv	µg/m <sup>3</sup>	ppbv	µg/m <sup>3</sup>	
Benzene	0.004	0.013	0.97	3.10	7.6

Methods for the Determination of Toxic Organic Compound in Ambient Air, 2<sup>nd</sup> : EPA Methods TO-15,1999

Jutarat Jaemruen

( Miss Jutarat Jaemruen )

Analyst

Araya Tipparuk

( Mrs. Araya Tipparuk )

Technical Management Team

Remark : 1. Reported analysis refers to submitted sample only.

2. This report shall not be reproduce, except in full, without official approval.

3. \* Notification of the Pollution Control Department, dated December 18,B.E.2551(2008), which was published in the Royal Government Gazette Vol. 126, Special Part 13D dated January 27, B.E. 2552 (2009).



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TEL. (662) 959-3600 FAX (662) 959-3535 Website : secot.co.th E-mail : envserv@secot.co.th

AMBIENT AIR QUALITY ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 1288/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Subatmospheric Pressure Sampling
SAMPLING DATE	: 03-04/08/2023	ANALYTICAL DATE	: 07-08/08/2023
SAMPLING TIME	: 15:41-14:50	SAMPLE CONDITION	: Normal
RECEIVED DATE	: 05/08/2023	FILE CODE	: 223003_TO-15_August
REPORT DATE	: 18/08/2023		

Compound	Non Detection		SAMPLING LOCATION		STANDARD* ( $\mu\text{g}/\text{m}^3$ )
			Map Ta Phut New Town		
	ppbv	$\mu\text{g}/\text{m}^3$	ppbv	$\mu\text{g}/\text{m}^3$	
Benzene	0.004	0.013	0.78	2.49	7.6

Methods for the Determination of Toxic Organic Compound in Ambient Air, 2<sup>nd</sup> : EPA Methods TO-15,1999

Jutarat Jaemruen

(Miss Jutarat Jaemruen)

Analyst

Siriwan Chimsa-nga

(Miss Siriwan Chimsa-nga)

Technical Management Team

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TEL. (662) 959-3600 FAX (662) 959-3535 Website : secot.co.th E-mail : envserv@secot.co.th

AMBIENT AIR QUALITY ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 1526/66
SAMPLING BY	: SECOT Co., Ltd .	SAMPLING METHOD	: Subatmospheric Pressure Sampling
SAMPLING DATE	: 04-05/09/2023	ANALYTICAL DATE	: 08 ,13/09/2023
SAMPLING TIME	: 12:03-11:02	SAMPLE CONDITION	: Normal
RECEIVED DATE	: 06/09/2023	FILE CODE	: 223003_TO-15_September
REPORT DATE	: 14/09/2023		

Compound	Non Detection		SAMPLING LOCATION		STANDARD* (µg/m <sup>3</sup> )
			Map Ta Phut New Town		
	ppbv	µg/m <sup>3</sup>	ppbv	µg/m <sup>3</sup>	
Benzene	0.004	0.013	1.17	3.74	7.6

Methods for the Determination of Toxic Organic Compound in Ambient Air, 2<sup>nd</sup> : EPA Methods TO-15,1999

*Siriwan Chimsa-nga*

(Miss Siriwan Chimsa-nga)

Analyst

( Mrs. Araya Tipparuk )

Technical Management Team

**Remark :** 1. Reported analysis refers to submitted sample only.

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TEL. (662) 959-3600 FAX (662) 959-3535 Website : secot.co.th E-mail : envserv@secot.co.th

AMBIENT AIR QUALITY ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 1707/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Subatmospheric Pressure Sampling
SAMPLING DATE	: 02-03/10/2023	ANALYTICAL DATE	: 05, 07/10/2023
SAMPLING TIME	: 10:50-10:58	SAMPLE CONDITION	: Normal
RECEIVED DATE	: 04/10/2023	FILE CODE	: 223003_TO-15_October
REPORT DATE	: 10/10/2023		

Compound	Non Detection		SAMPLING LOCATION		STANDARD* ( $\mu\text{g}/\text{m}^3$ )
			Map Ta Phut New Town		
	ppbv	$\mu\text{g}/\text{m}^3$	ppbv	$\mu\text{g}/\text{m}^3$	
Benzene	0.004	0.013	0.95	3.03	7.6

Methods for the Determination of Toxic Organic Compound in Ambient Air, 2<sup>nd</sup> : EPA Methods TO-15, 1999

*Siriwan Chimsa-nga*  
(Miss Siriwan Chimsa-nga)

Analyst

(Mrs. Araya Tipparuk)

Technical Management Team

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AMBIENT AIR QUALITY ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 1905/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Subatmospheric Pressure Sampling
SAMPLING DATE	: 01-02/11/2023	ANALYTICAL DATE	: 04/11/2023
SAMPLING TIME	: 14:33-14:18	SAMPLE CONDITION	: Normal
RECEIVED DATE	: 03/11/2023	FILE CODE	: 223003_TO-15_November
REPORT DATE	: 08/11/2023		

Compound	Non Detection		SAMPLING LOCATION		STANDARD* (µg/m <sup>3</sup> )
			Map Ta Phut New Town		
	ppbv	µg/m <sup>3</sup>	ppbv	µg/m <sup>3</sup>	
Benzene	0.004	0.013	0.60	1.92	7.6

Methods for the Determination of Toxic Organic Compound in Ambient Air, 2<sup>nd</sup> : EPA Methods TO-15,1999

Jutarat Jaemruen

( Miss Jutarat Jaemruen )

Analyst

Araya Tipparuk

( Mrs. Araya Tipparuk )

Technical Management Team

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AMBIENT AIR QUALITY ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 2184/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Subatmospheric Pressure Sampling
SAMPLING DATE	: 06-07/12/2023	ANALYTICAL DATE	: 11, 15/12/2023
SAMPLING TIME	: 11:29-11:11	SAMPLE CONDITION	: Normal
RECEIVED DATE	: 08/12/2023	FILE CODE	: 223003_TO-15_December
REPORT DATE	: 18/12/2023		

Compound	Non Detection		SAMPLING LOCATION		STANDARD* (µg/m <sup>3</sup> )
			Map Ta Phut New Town		
	ppbv	µg/m <sup>3</sup>	ppbv	µg/m <sup>3</sup>	
Benzene	0.004	0.013	0.69	2.20	7.6

Methods for the Determination of Toxic Organic Compound in Ambient Air, 2<sup>nd</sup> : EPA Methods TO-15,1999

Jutarat Jaemruen

( Miss Jutarat Jaemruen )

Analyst

Araya Tipparuk

( Mrs. Araya Tipparuk )

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AMBIENT AIR QUALITY ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 1101/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Subatmospheric Pressure Sampling
SAMPLING DATE	: 03-04/07/2023	ANALYTICAL DATE	: 10, 13/07/2023
SAMPLING TIME	: 12:20-11:40	SAMPLE CONDITION	: Normal
RECEIVED DATE	: 05/07/2023	FILE CODE	: 223003_TO-15_July
REPORT DATE	: 15/07/2023		

Compound	Non Detection		SAMPLING LOCATION		STANDARD* (µg/m <sup>3</sup> )
			Ban Plong Community		
	ppbv	µg/m <sup>3</sup>	ppbv	µg/m <sup>3</sup>	
Benzene	0.004	0.013	2.27	7.25	7.6

Methods for the Determination of Toxic Organic Compound in Ambient Air, 2<sup>nd</sup> : EPA Methods TO-15, 1999

*Jutarat Jaemruen*

( Miss Jutarat Jaemruen )

Analyst

*Araya Tipparuk*

( Mrs. Araya Tipparuk )

Technical Management Team

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AMBIENT AIR QUALITY ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 1426/66
SAMPLING BY	: SECOT Co., Ltd .	SAMPLING METHOD	: Subatmospheric Pressure Sampling
SAMPLING DATE	: 21-22/08/2023	ANALYTICAL DATE	: 24/08/2023
SAMPLING TIME	: 14:06-14:44	SAMPLE CONDITION	: Normal
RECEIVED DATE	: 23/08/2023	FILE CODE	: 223003_TO-15_August
REPORT DATE	: 25/08/2023		

Compound	Non Detection		SAMPLING LOCATION		STANDARD* (µg/m <sup>3</sup> )
			Ban Plong Community		
	ppbv	µg/m <sup>3</sup>	ppbv	µg/m <sup>3</sup>	
Benzene	0.004	0.013	0.83	2.64	7.6

Methods for the Determination of Toxic Organic Compound in Ambient Air, 2<sup>nd</sup> : EPA Methods TO-15.1999

Jutarat Jaemruen

( Miss Jutarat Jaemruen )

Analyst

Araya Tipparuk

( Mrs. Araya Tipparuk )

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AMBIENT AIR QUALITY ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 1526/66
SAMPLING BY	: SECOT Co., Ltd .	SAMPLING METHOD	: Subatmospheric Pressure Sampling
SAMPLING DATE	: 04-05/09/2023	ANALYTICAL DATE	: 08 ,13/09/2023
SAMPLING TIME	: 11:48-11:38	SAMPLE CONDITION	: Normal
RECEIVED DATE	: 06/09/2023	FILE CODE	: 223003_TO-15_September
REPORT DATE	: 14/09/2023		

Compound	SAMPLING LOCATION				STANDARD* (µg/m <sup>3</sup> )
	Non Detection		Ban Plong Community		
	ppbv	µg/m <sup>3</sup>	ppbv	µg/m <sup>3</sup>	
Benzene	0.004	0.013	3.09	9.87	7.6

Methods for the Determination of Toxic Organic Compound in Ambient Air, 2<sup>nd</sup> : EPA Methods TO-15,1999

*Siriwan Chimsa-nga*

(Miss Siriwan Chimsa-nga)

Analyst

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AMBIENT AIR QUALITY ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 1707/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Subatmospheric Pressure Sampling
SAMPLING DATE	: 02-03/10/2023	ANALYTICAL DATE	: 05, 07/10/2023
SAMPLING TIME	: 10:30-10:35	SAMPLE CONDITION	: Normal
RECEIVED DATE	: 04/10/2023	FILE CODE	: 223003_TO-15_October
REPORT DATE	: 10/10/2023		

Compound	Non Detection		SAMPLING LOCATION		STANDARD* (µg/m <sup>3</sup> )
			Ban Plong Community		
	ppbv	µg/m <sup>3</sup>	ppbv	µg/m <sup>3</sup>	
Benzene	0.004	0.013	0.65	2.08	7.6

Methods for the Determination of Toxic Organic Compound in Ambient Air, 2<sup>nd</sup> : EPA Methods TO-15, 1999

*Siriwan Chimsa-nga*

(Miss Siriwan Chimsa-nga)

Analyst

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AMBIENT AIR QUALITY ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 1905/66
SAMPLING BY	: SECOT Co., Ltd .	SAMPLING METHOD	: Subatmospheric Pressure Sampling
SAMPLING DATE	: 01-02/11/2023	ANALYTICAL DATE	: 04/11/2023
SAMPLING TIME	: 13:00-12:15	SAMPLE CONDITION	: Normal
RECEIVED DATE	: 03/11/2023	FILE CODE	: 223003_TO-15_November
REPORT DATE	: 08/11/2023		

Compound	Non Detection		SAMPLING LOCATION		STANDARD* (µg/m <sup>3</sup> )
			Ban Plong Community		
	ppbv	µg/m <sup>3</sup>	ppbv	µg/m <sup>3</sup>	
Benzene	0.004	0.013	0.60	1.92	7.6

Methods for the Determination of Toxic Organic Compound in Ambient Air, 2<sup>nd</sup> : EPA Methods TO-15,1999

Jutarat Jaemruen

( Miss Jutarat Jaemruen )

Analyst

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AMBIENT AIR QUALITY ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 2184/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Subatmospheric Pressure Sampling
SAMPLING DATE	: 06-07/12/2023	ANALYTICAL DATE	: 11, 15/12/2023
SAMPLING TIME	: 10:30-10:46	SAMPLE CONDITION	: Normal
RECEIVED DATE	: 08/12/2023	FILE CODE	: 223003_TO-15_December
REPORT DATE	: 18/12/2023		

Compound	SAMPLING LOCATION				STANDARD* (µg/m <sup>3</sup> )
	Non Detection		Ban Plong Community		
	ppbv	µg/m <sup>3</sup>	ppbv	µg/m <sup>3</sup>	
Benzene	0.004	0.013	0.80	2.56	7.6

Methods for the Determination of Toxic Organic Compound in Ambient Air, 2<sup>nd</sup> : EPA Methods TO-15,1999

Jutarat Jaemruen

( Miss Jutarat Jaemruen )

Analyst

Araya Tipparuk

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## ใบรับรองผลการตรวจวัดคุณภาพอากาศจากปล่องระบายอากาศ





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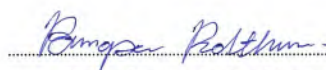
TEL : +66(0) 2959-3600 FAX : +66(0) 2959-3535 E-mail : envserv@secot.co.th

## STACK EMISSION ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REFERENCE NO.	: Refinery-223003-COA-Stk/PM
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING DATE	: 11/12/2023
RECEIVED DATE	: 12/12/2023	ANALYTICAL DATE	: 12-13/12/2023
REPORT DATE	: 14/12/2023	SAMPLE CONDITION	: Normal
STACK LOCATION	: RFCCU Stack	OPERATOR	: Mr. Song Hengchwankun
SOURCE DESCRIPTION	: Combustion	FUEL TYPE	: Natural Gas + Refinery Fuel Gas
STACK DESCRIPTION			

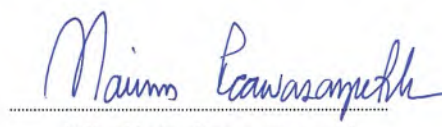
Height	: 70.0	m	Gas Velocity	: 16.8	m/s
Diameter	: 3.2	m	Flow rate <sup>(1)</sup>	: 3,718	Ncu.m/min
Temperature	: 280.9	°C	Excess Oxygen	: 3.5	%

PARAMETER	UNIT	RESULTS <sup>(1)</sup>		ASSIGNED VALUE <sup>(2)</sup>	STANDARD <sup>(3)</sup>	REFERENCE METHODS
		3.5 % O <sub>2</sub>	7 % O <sub>2</sub>			
Particulate Matter	mg/Ncu.m	78.5	62.7	240	320	US. EPA Method 5

  
(Miss Pornnapa Budthum)

Analyst

REG.NO.จ-239-ก-0018

  
(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO.จ-239-ก-0010

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3. <sup>(1)</sup> At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. <sup>(2)</sup> Assigned value in EIA Report Expansion 3 of Refinery Plant, B.E. 2561 (2018).

5. <sup>(3)</sup> Notification of the Ministry of Natural Resources and Environment B.E.2554 (2011).





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### STACK EMISSION ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REFERENCE NO.	: Refinery-223003-COA-Stk/HM
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING DATE	: 11/12/2023
RECEIVED DATE	: 12/12/2023	ANALYTICAL DATE	: 12-16/12/2023
REPORT DATE	: 19/12/2023	SAMPLE CONDITION	: Normal
STACK LOCATION	: RFCCU Stack	OPERATOR	: Mr. Song Hengchwankun
SOURCE DESCRIPTION	: Combustion	FUEL TYPE	: Natural Gas + Refinery Fuel Gas

#### STACK DESCRIPTION

Height	: 70.0	m	Gas Velocity	: 16.8	m/s
Diameter	: 3.2	m	Flow rate <sup>(1)</sup>	: 3,718	Ncu.m/min
Temperature	: 280.9	°C	Excess Oxygen	: 3.5	%

PARAMETER	UNIT	RESULTS <sup>(1)</sup>		ASSIGNED VALUE <sup>(2)</sup>	STANDARD <sup>(3)</sup>	REFERENCE METHODS
		3.5 % O <sub>2</sub>	7 % O <sub>2</sub>			
Mercury	mg/Ncu.m	<0.0003	<0.0002	2.4	2.4	US. EPA Method 29
Lead	mg/Ncu.m	<0.02	<0.02	5.0	5.0	US. EPA Method 29

  
.....  
(Miss Krisana Chanthoom)

Analyst

REG.NO.จ-239-ก-0017

  
.....  
(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO.จ-239-ก-0010

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3. <sup>(1)</sup> At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. <sup>(2)</sup> Assigned value in EIA Report Expansion 3 of Refinery Plant, B.E. 2561 (2018).

5. <sup>(3)</sup> Notification of the Ministry of Natural Resources and Environment B.E.2554 (2011).

**The Monitoring Result of Emission Concentration**  
**RFCCU**  
**STAR PETROLEUM REFINING PUBLIC CO.,LTD.**  
**December 11, 2023**

Run Number	Oxygen content (%)		Oxide of Nitrogen (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	3.57	3.52	160.57	160.80	128.60
2	3.60	3.56	162.15	162.40	130.18
3	3.39	3.35	165.77	166.05	131.52
<b>Average</b>	<b>3.52</b>	<b>3.48</b>	<b>162.83</b>	<b>163.08</b>	<b>130.10</b>

Run Number	Oxygen content (%)		Sulfur dioxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	3.57	3.52	543.20	543.26	434.48
2	3.60	3.56	541.73	541.81	434.32
3	3.39	3.35	553.33	553.43	438.33
<b>Average</b>	<b>3.52</b>	<b>3.48</b>	<b>546.09</b>	<b>546.17</b>	<b>435.72</b>


Run Number	Oxygen content (%)		Carbonmonoxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	3.57	3.52	185.70	186.09	148.83
2	3.60	3.56	181.55	181.87	145.79
3	3.39	3.35	180.04	180.30	142.80
<b>Average</b>	<b>3.52</b>	<b>3.48</b>	<b>182.43</b>	<b>182.75</b>	<b>145.80</b>

# STAR PETROLEUM REFINING PUBLIC CO.,LTD.

## EMISSION TEST RESULT

<b>Date:</b> December 11, 2023 <b>Start time:</b> 10:50 AM <b>O<sub>2</sub> instrument Model:</b> AMI 70 <b>NO<sub>x</sub> instrument Model:</b> API 200 AH <b>SO<sub>2</sub> instrument Model:</b> API 100 AH <b>CO instrument Model:</b> THERMO 48 C <b>Fuel Type :</b> Fuel Gas	<b>Run # :</b> 1 <b>Location :</b> RFCCU <b>Finish time :</b> 11:10 AM <b>Serial No.:</b> 111117-2 <b>Serial No.:</b> 441 <b>Serial No.:</b> 060 <b>Serial No.:</b> 78253-388 <b>Test Operator :</b> Song H.
--	---

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
10:50 AM	3.54	172.27	510.75	179.42
10:51 AM	3.56	167.80	515.01	184.34
10:52 AM	3.55	165.98	520.63	189.58
10:53 AM	3.60	164.08	524.16	192.60
10:54 AM	3.60	162.86	514.32	193.71
10:55 AM	3.58	159.62	527.61	194.89
10:56 AM	3.48	159.55	550.56	193.37
10:57 AM	3.48	161.96	541.73	192.01
10:58 AM	3.57	161.82	527.33	190.84
10:59 AM	3.61	159.29	547.99	190.00
11:00 AM	3.57	158.25	552.11	188.23
11:01 AM	3.56	158.30	542.17	187.38
11:02 AM	3.65	157.05	533.22	185.43
11:03 AM	3.63	153.64	556.90	185.18
11:04 AM	3.61	154.57	565.73	182.62
11:05 AM	3.56	158.15	566.26	180.83
11:06 AM	3.57	158.97	561.36	179.90
11:07 AM	3.59	159.85	562.98	177.88
11:08 AM	3.54	159.15	569.85	176.86
11:09 AM	3.53	159.54	564.50	177.20
11:10 AM	3.53	159.30	552.10	177.37
<b>Average</b>	3.57	160.57	543.20	185.70


  
 Signature \_\_\_\_\_  
 Miss Katesarin Vorradetwittaya  
 Environmental Scientist

# STAR PETROLEUM REFINING PUBLIC CO.,LTD.

## EMISSION TEST RESULT

<b>Date:</b> <u>December 11, 2023</u> <b>Start time:</b> <u>11:11 AM</u> <b>O<sub>2</sub> instrument Model:</b> <u>AMI 70</u> <b>NO<sub>x</sub> instrument Model:</b> <u>API 200 AH</u> <b>SO<sub>2</sub> instrument Model:</b> <u>API 100 AH</u> <b>CO instrument Model:</b> <u>THERMO 48 C</u> <b>Fuel Type :</b> <u>Fuel Gas</u>	<b>Run # :</b> <u>2</u> <b>Location :</b> <u>RFCCU</u> <b>Finish time :</b> <u>11:31 AM</u> <b>Serial No.:</b> <u>111117-2</u> <b>Serial No.:</b> <u>441</u> <b>Serial No.:</b> <u>060</u> <b>Serial No.:</b> <u>78253-388</u> <b>Test Operator :</b> <u>Song H.</u>
---	---

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
11:11 AM	3.55	159.45	550.97	174.92
11:12 AM	3.61	159.97	532.52	176.44
11:13 AM	3.65	158.75	531.75	175.51
11:14 AM	3.66	158.96	547.54	174.51
11:15 AM	3.64	160.41	539.12	173.50
11:16 AM	3.66	160.70	537.78	173.51
11:17 AM	3.59	161.22	539.89	173.25
11:18 AM	3.49	173.44	536.25	173.59
11:19 AM	3.52	176.08	525.03	174.59
11:20 AM	3.55	173.26	527.13	177.54
11:21 AM	3.62	166.86	516.34	181.77
11:22 AM	3.66	160.28	525.86	185.51
11:23 AM	3.64	160.36	557.04	188.98
11:24 AM	3.58	161.86	547.03	190.07
11:25 AM	3.61	160.30	541.19	191.50
11:26 AM	3.63	158.95	540.25	191.07
11:27 AM	3.65	158.34	548.29	189.65
11:28 AM	3.62	157.49	551.30	187.96
11:29 AM	3.60	158.39	553.64	187.96
11:30 AM	3.54	159.36	556.33	185.84
11:31 AM	3.53	160.80	571.06	184.83
<b>Average</b>	3.60	162.15	541.73	181.55

  
 Signature \_\_\_\_\_  
**Miss Katesarin Vorradetwittaya**  
**Environmental Scientist**



# STAR PETROLEUM REFINING PUBLIC CO.,LTD.

## EMISSION TEST RESULT

<b>Date:</b> <u>December 11, 2023</u> <b>Start time:</b> <u>11:32 AM</u> <b>O<sub>2</sub> instrument Model:</b> <u>AMI 70</u> <b>NO<sub>x</sub> instrument Model:</b> <u>API 200 AH</u> <b>SO<sub>2</sub> instrument Model:</b> <u>API 100 AH</u> <b>CO instrument Model:</b> <u>THERMO 48 C</u> <b>Fuel Type :</b> <u>Fuel Gas</u>	<b>Run # :</b> <u>3</u> <b>Location :</b> <u>RFCCU</u> <b>Finish time :</b> <u>11:52 AM</u> <b>Serial No.:</b> <u>111117-2</u> <b>Serial No.:</b> <u>441</u> <b>Serial No.:</b> <u>060</u> <b>Serial No.:</b> <u>78253-388</u> <b>Test Operator :</b> <u>Song H.</u>
---	---

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
11:32 AM	3.53	163.16	560.94	183.73
11:33 AM	3.49	161.45	558.10	183.04
11:34 AM	3.45	160.78	568.13	181.50
11:35 AM	3.39	160.69	569.11	181.76
11:36 AM	3.44	162.43	540.54	182.53
11:37 AM	3.45	161.14	556.87	183.21
11:38 AM	3.46	163.58	560.26	182.10
11:39 AM	3.46	163.39	548.07	182.19
11:40 AM	3.45	161.54	553.75	182.10
11:41 AM	3.45	162.17	570.25	180.83
11:42 AM	3.45	162.04	555.33	179.73
11:43 AM	3.44	161.81	550.33	179.39
11:44 AM	3.45	163.34	558.95	178.30
11:45 AM	3.43	163.75	549.73	177.11
11:46 AM	3.40	163.42	556.36	175.26
11:47 AM	3.33	163.92	557.09	173.59
11:48 AM	3.20	171.54	542.08	174.26
11:49 AM	3.16	181.44	539.41	175.08
11:50 AM	3.20	179.51	549.96	176.94
11:51 AM	3.25	176.63	534.79	181.67
11:52 AM	3.32	173.49	539.95	186.52
<b>Average</b>	3.39	165.77	553.33	180.04

Signature



Miss Katesarin Vorradetwittaya

Environmental Scientist



บริษัท ซีคอต จำกัด

SECOT CO., LTD.

239 ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพฯ 10800

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TEL : +66(0) 2959-3600 FAX : +66(0) 2959-3535 E-mail : envserv@secot.co.th

### STACK EMISSION ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REFERENCE NO.	: Refinery-223003-COA-Stk/PM
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING DATE	: 04/12/2023
RECEIVED DATE	: 08/12/2023	ANALYTICAL DATE	: 11-12/12/2023
REPORT DATE	: 14/12/2023	SAMPLE CONDITION	: Normal
STACK LOCATION	: CDU Stack	OPERATOR	: Mr. Song Hengchwankun
SOURCE DESCRIPTION	: Combustion	FUEL TYPE	: Natural Gas + Refinery Fuel Gas

#### STACK DESCRIPTION

Height	: 63.2	m	Gas Velocity	: 8.8	m/s
Diameter	: 3.0	m	Flow rate <sup>(1)</sup>	: 2,176	Ncu.m/min
Temperature	: 184.5	°C	Excess Oxygen	: 3.5	%

PARAMETER	UNIT	RESULTS <sup>(1)</sup>		ASSIGNED VALUE <sup>(2)</sup>	STANDARD <sup>(3)</sup>	REFERENCE METHODS
		3.5 % O <sub>2</sub>	7 % O <sub>2</sub>			
Particulate Matter	mg/Ncu.m	1.3	1.0	60	60	US. EPA Method 5

  
(Miss Pornnapa Budthum)

Analyst

REG.NO.จ-239-ก-0018

  
(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO.จ-239-ก-0010

**Remark :** 1. Reported analysis refers to submitted sample only.

2. This report shall not be reproduced, except in full, without official approval.

3. <sup>(1)</sup> At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. <sup>(2)</sup> Assigned value in EIA Report Expasion 3 of Refinery Plant, B.E. 2561 (2018).

5. <sup>(3)</sup> Notification of the Ministry of Natural Resources and Environment B.E.2554 (2011).

**The Monitoring Result of Emission Concentration**  
**CDU**  
**STAR PETROLEUM REFINING PUBLIC CO.,LTD.**  
**December 4, 2023**

Run Number	Oxygen content (%)		Oxide of Nitrogen (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	3.42	3.44	16.81	16.80	13.37
2	3.40	3.45	16.61	16.60	13.22
3	3.41	3.49	16.61	16.60	13.25
<b>Average</b>	<b>3.41</b>	<b>3.46</b>	<b>16.68</b>	<b>16.67</b>	<b>13.28</b>

Run Number	Oxygen content (%)		Sulfur dioxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	3.42	3.44	3.22	3.19	2.54
2	3.40	3.45	3.77	3.75	2.99
3	3.41	3.49	3.69	3.67	2.93
<b>Average</b>	<b>3.41</b>	<b>3.46</b>	<b>3.56</b>	<b>3.54</b>	<b>2.82</b>


Run Number	Oxygen content (%)		Carbonmonoxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	3.42	3.44	0.65	0.60	0.48
2	3.40	3.45	0.58	0.54	0.43
3	3.41	3.49	0.54	0.51	0.41
<b>Average</b>	<b>3.41</b>	<b>3.46</b>	<b>0.59</b>	<b>0.55</b>	<b>0.44</b>

# STAR PETROLEUM REFINING PUBLIC CO.,LTD.

## EMISSION TEST RESULT

<b>Date:</b> December 4, 2023 <b>Start time:</b> 3:25 PM <b>O<sub>2</sub> instrument Model:</b> AMI 70 <b>NO<sub>x</sub> instrument Model:</b> TELEDYNE 200 EM <b>SO<sub>2</sub> instrument Model:</b> API 100 AH <b>CO instrument Model:</b> THERMO 48 C <b>Fuel Type :</b> Natural Gas	<b>Run # :</b> 1 <b>Location :</b> CDU <b>Finish time :</b> 3:45 PM <b>Serial No.:</b> 161212-14 <b>Serial No.:</b> 435 <b>Serial No.:</b> 058 <b>Serial No.:</b> 412106049 <b>Test Operator :</b> Pisanu S.
--	---

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
3:25 PM	3.42	16.21	2.32	0.70
3:26 PM	3.34	16.61	2.56	0.65
3:27 PM	3.30	16.83	2.83	0.69
3:28 PM	3.28	16.94	2.61	0.70
3:29 PM	3.39	17.03	2.54	0.69
3:30 PM	3.50	17.06	2.59	0.66
3:31 PM	3.39	16.87	2.80	0.59
3:32 PM	3.40	16.68	3.05	0.69
3:33 PM	3.51	16.78	3.21	0.59
3:34 PM	3.51	16.82	3.27	0.69
3:35 PM	3.44	16.80	3.40	0.71
3:36 PM	3.46	16.87	3.43	0.71
3:37 PM	3.50	16.93	3.50	0.61
3:38 PM	3.43	16.84	3.62	0.53
3:39 PM	3.44	16.87	3.67	0.63
3:40 PM	3.47	16.97	3.64	0.71
3:41 PM	3.41	16.89	3.66	0.64
3:42 PM	3.42	16.82	3.75	0.66
3:43 PM	3.37	16.76	3.73	0.69
3:44 PM	3.44	16.75	3.77	0.62
3:45 PM	3.38	16.69	3.75	0.52
<b>Average</b>	3.42	16.81	3.22	0.65

Signature   
 Miss Katesarin Vorradetwittaya  
 Environmental Scientist



# STAR PETROLEUM REFINING PUBLIC CO.,LTD.

## EMISSION TEST RESULT

<b>Date:</b> December 4, 2023 <b>Start time:</b> 3:46 PM <b>O<sub>2</sub> instrument Model:</b> AMI 70 <b>NO<sub>x</sub> instrument Model:</b> TELEDYNE 200 EM <b>SO<sub>2</sub> instrument Model:</b> API 100 AH <b>CO instrument Model:</b> THERMO 48 C <b>Fuel Type :</b> Natural Gas	<b>Run # :</b> 2 <b>Location :</b> CDU <b>Finish time :</b> 4:06 PM <b>Serial No.:</b> 161212-14 <b>Serial No.:</b> 435 <b>Serial No.:</b> 058 <b>Serial No.:</b> 412106049 <b>Test Operator :</b> Pisanu S.
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Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
3:46 PM	3.33	16.61	3.75	0.70
3:47 PM	3.35	16.58	3.74	0.54
3:48 PM	3.31	16.53	3.73	0.68
3:49 PM	3.32	16.48	3.76	0.54
3:50 PM	3.37	16.57	3.75	0.59
3:51 PM	3.39	16.60	3.77	0.62
3:52 PM	3.44	16.49	3.76	0.59
3:53 PM	3.46	16.53	3.76	0.60
3:54 PM	3.50	16.62	3.80	0.52
3:55 PM	3.53	16.81	3.77	0.52
3:56 PM	3.49	16.90	3.84	0.60
3:57 PM	3.47	16.69	3.80	0.64
3:58 PM	3.44	16.53	3.80	0.57
3:59 PM	3.36	16.43	3.73	0.67
4:00 PM	3.43	16.54	3.80	0.65
4:01 PM	3.36	16.63	3.76	0.55
4:02 PM	3.34	16.60	3.77	0.51
4:03 PM	3.33	16.62	3.75	0.51
4:04 PM	3.39	16.69	3.77	0.51
4:05 PM	3.38	16.66	3.77	0.61
4:06 PM	3.42	16.66	3.77	0.51
<b>Average</b>	3.40	16.61	3.77	0.58

Signature



Miss Katesarin Vorradetwittaya

Environmental Scientist

# STAR PETROLEUM REFINING PUBLIC CO.,LTD.

## EMISSION TEST RESULT

<b>Date:</b> December 4, 2023 <b>Start time:</b> 4:07 PM <b>O<sub>2</sub> instrument Model:</b> AMI 70 <b>NO<sub>x</sub> instrument Model:</b> TELEDYNE 200 EM <b>SO<sub>2</sub> instrument Model:</b> API 100 AH <b>CO instrument Model:</b> THERMO 48 C <b>Fuel Type :</b> Natural Gas	<b>Run # :</b> 3 <b>Location :</b> CDU <b>Finish time :</b> 4:27 PM <b>Serial No.:</b> 161212-14 <b>Serial No.:</b> 435 <b>Serial No.:</b> 058 <b>Serial No.:</b> 412106049 <b>Test Operator :</b> Pisanu S.
--	---

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
4:07 PM	3.36	16.67	3.79	0.55
4:08 PM	3.41	16.72	3.77	0.51
4:09 PM	3.44	16.81	3.75	0.61
4:10 PM	3.35	16.51	3.76	0.56
4:11 PM	3.42	16.31	3.70	0.71
4:12 PM	3.33	16.41	3.75	0.53
4:13 PM	3.43	16.45	3.77	0.51
4:14 PM	3.34	16.42	3.69	0.63
4:15 PM	3.42	16.56	3.70	0.53
4:16 PM	3.44	16.78	3.74	0.54
4:17 PM	3.40	16.83	3.71	0.51
4:18 PM	3.48	16.75	3.65	0.51
4:19 PM	3.45	16.73	3.70	0.53
4:20 PM	3.49	16.74	3.67	0.59
4:21 PM	3.50	16.74	3.67	0.51
4:22 PM	3.48	16.68	3.61	0.51
4:23 PM	3.41	16.58	3.62	0.51
4:24 PM	3.40	16.61	3.59	0.51
4:25 PM	3.39	16.67	3.67	0.51
4:26 PM	3.36	16.55	3.66	0.51
4:27 PM	3.34	16.37	3.62	0.50
<b>Average</b>	3.41	16.61	3.69	0.54

Signature



Miss Katesarin Vorradetwittaya

Environmental Scientist



บริษัท ซีคอต จำกัด  
SECOT CO., LTD.

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TEL : +66(0) 2959-3600 FAX : +66(0) 2959-3535 E-mail : envserv@secot.co.th

### STACK EMISSION ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REFERENCE NO.	: Refinery-223003-COA-Stk/PM
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING DATE	: 07/12/2023
RECEIVED DATE	: 08/12/2023	ANALYTICAL DATE	: 11-12/12/2023
REPORT DATE	: 14/12/2023	SAMPLE CONDITION	: Normal
STACK LOCATION	: VDU Stack	OPERATOR	: Mr. Song Hengchwankun
SOURCE DESCRIPTION	: Combustion	FUEL TYPE	: Natural Gas + Refinery Fuel Gas

#### STACK DESCRIPTION

Height	: 54.0	m	Gas Velocity	: 9.8	m/s
Diameter	: 2.0	m	Flow rate <sup>(1)</sup>	: 1,050	Ncu.m/min
Temperature	: 187.2	°C	Excess Oxygen	: 4.4	%

PARAMETER	UNIT	RESULTS <sup>(1)</sup>		ASSIGNED VALUE <sup>(2)</sup>	STANDARD <sup>(3)</sup>	REFERENCE METHODS
		4.4 % O <sub>2</sub>	7 % O <sub>2</sub>			
Particulate Matter	mg/Ncu.m	1.8	1.5	60	60	US. EPA Method 5

  
(Miss Pornnapa Budthum)

Analyst

REG.NO.จ-239-จ-0018

  
(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO.จ-239-ท-0010

**Remark :** 1. Reported analysis refers to submitted sample only.

2. This report shall not be reproduced, except in full, without official approval.

3. <sup>(1)</sup> At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. <sup>(2)</sup> Assigned value in EIA Report Expansion 3 of Refinery Plant, B.E. 2561 (2018).

5. <sup>(3)</sup> Notification of the Ministry of Natural Resources and Environment B.E.2554 (2011).

**The Monitoring Result of Emission Concentration**  
**VDU**  
**STAR PETROLEUM REFINING PUBLIC CO.,LTD.**  
**December 7, 2023**

Run Number	Oxygen content (%)		Oxide of Nitrogen (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	4.37	4.40	19.98	19.98	16.83
2	4.45	4.48	20.22	20.22	17.12
3	4.39	4.42	20.15	20.15	17.00
<b>Average</b>	<b>4.40</b>	<b>4.43</b>	<b>20.12</b>	<b>20.12</b>	<b>16.98</b>

Run Number	Oxygen content (%)		Sulfur dioxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	4.37	4.40	1.36	1.31	1.10
2	4.45	4.48	1.40	1.35	1.14
3	4.39	4.42	1.12	1.08	0.91
<b>Average</b>	<b>4.40</b>	<b>4.43</b>	<b>1.29</b>	<b>1.25</b>	<b>1.05</b>

Run Number	Oxygen content (%)		Carbonmonoxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	4.37	4.40	0.73	0.66	0.56
2	4.45	4.48	0.72	0.66	0.56
3	4.39	4.42	0.72	0.66	0.56
<b>Average</b>	<b>4.40</b>	<b>4.43</b>	<b>0.72</b>	<b>0.66</b>	<b>0.56</b>




# STAR PETROLEUM REFINING PUBLIC CO.,LTD.

## EMISSION TEST RESULT

<b>Date:</b> <u>December 7, 2023</u> <b>Start time:</b> <u>10:50 AM</u> <b>O<sub>2</sub> instrument Model:</b> <u>AMI 70</u> <b>NO<sub>x</sub> instrument Model:</b> <u>TELEDYNE 200 EM</u> <b>SO<sub>2</sub> instrument Model:</b> <u>API 100 AH</u> <b>CO instrument Model:</b> <u>THERMO 48 C</u> <b>Fuel Type :</b> <u>Natural Gas</u>	<b>Run # :</b> <u>1</u> <b>Location :</b> <u>VDU</u> <b>Finish time :</b> <u>11:10 AM</u> <b>Serial No.:</b> <u>161212-14</u> <b>Serial No.:</b> <u>435</u> <b>Serial No.:</b> <u>058</u> <b>Serial No.:</b> <u>412106049</u> <b>Test Operator :</b> <u>Song H.</u>
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Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
10:50 AM	4.38	19.97	1.23	0.73
10:51 AM	4.32	19.98	1.26	0.73
10:52 AM	4.32	19.94	1.28	0.73
10:53 AM	4.36	19.93	1.30	0.73
10:54 AM	4.35	19.96	1.32	0.73
10:55 AM	4.37	19.91	1.35	0.73
10:56 AM	4.35	19.87	1.37	0.73
10:57 AM	4.35	19.86	1.38	0.73
10:58 AM	4.29	19.88	1.41	0.73
10:59 AM	4.28	19.86	1.41	0.73
11:00 AM	4.30	19.83	1.44	0.73
11:01 AM	4.31	19.81	1.47	0.73
11:02 AM	4.38	19.86	1.49	0.73
11:03 AM	4.40	19.96	1.50	0.73
11:04 AM	4.42	20.04	1.26	0.73
11:05 AM	4.40	20.10	1.30	0.73
11:06 AM	4.39	20.11	1.30	0.72
11:07 AM	4.40	20.12	1.33	0.72
11:08 AM	4.43	20.14	1.35	0.72
11:09 AM	4.46	20.24	1.36	0.72
11:10 AM	4.45	20.31	1.39	0.72
<b>Average</b>	4.37	19.98	1.36	0.73

Signature   
 Miss Katesarin Vorradetwittaya  
 Environmental Scientist

# STAR PETROLEUM REFINING PUBLIC CO.,LTD.

## EMISSION TEST RESULT

<b>Date:</b> December 7, 2023 <b>Start time:</b> 11:11 AM <b>O<sub>2</sub> instrument Model:</b> AMI 70 <b>NO<sub>x</sub> instrument Model:</b> TELEDYNE 200 EM <b>SO<sub>2</sub> instrument Model:</b> API 100 AH <b>CO instrument Model:</b> THERMO 48 C <b>Fuel Type :</b> Natural Gas	<b>Run # :</b> 2 <b>Location :</b> VDU <b>Finish time :</b> 11:31 AM <b>Serial No.:</b> 161212-14 <b>Serial No.:</b> 435 <b>Serial No.:</b> 058 <b>Serial No.:</b> 412106049 <b>Test Operator :</b> Song H.
---	--

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
11:11 AM	4.46	20.24	1.40	0.72
11:12 AM	4.45	20.21	1.41	0.72
11:13 AM	4.48	20.21	1.43	0.72
11:14 AM	4.49	20.23	1.45	0.72
11:15 AM	4.49	20.25	1.46	0.72
11:16 AM	4.49	20.26	1.48	0.72
11:17 AM	4.43	20.28	1.31	0.72
11:18 AM	4.39	20.28	1.27	0.72
11:19 AM	4.34	20.20	1.32	0.72
11:20 AM	4.38	20.12	1.43	0.72
11:21 AM	4.41	20.11	1.29	0.73
11:22 AM	4.48	20.17	1.24	0.73
11:23 AM	4.50	20.24	1.32	0.73
11:24 AM	4.47	20.29	1.35	0.73
11:25 AM	4.46	20.28	1.27	0.73
11:26 AM	4.46	20.24	1.54	0.73
11:27 AM	4.43	20.22	1.26	0.73
11:28 AM	4.41	20.20	1.82	0.72
11:29 AM	4.43	20.14	1.27	0.72
11:30 AM	4.49	20.16	1.37	0.72
11:31 AM	4.53	20.20	1.65	0.72
<b>Average</b>	4.45	20.22	1.40	0.72

Signature



Miss Katesarin Vorradetwittaya

Environmental Scientist

## STAR PETROLEUM REFINING PUBLIC CO.,LTD. EMISSION TEST RESULT

<b>Date:</b> <u>December 7, 2023</u> <b>Start time:</b> <u>11:32 AM</u> <b>O<sub>2</sub> instrument Model:</b> <u>AMI 70</u> <b>NO<sub>x</sub> instrument Model:</b> <u>TELEDYNE 200 EM</u> <b>SO<sub>2</sub> instrument Model:</b> <u>API 100 AH</u> <b>CO instrument Model:</b> <u>THERMO 48 C</u> <b>Fuel Type :</b> <u>Natural Gas</u>	<b>Run # :</b> <u>3</u> <b>Location :</b> <u>VDU</u> <b>Finish time :</b> <u>11:52 AM</u> <b>Serial No.:</b> <u>161212-14</u> <b>Serial No.:</b> <u>435</u> <b>Serial No.:</b> <u>058</u> <b>Serial No.:</b> <u>412106049</u> <b>Test Operator :</b> <u>Song H.</u>
--	--

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
11:32 AM	4.45	20.23	1.04	0.72
11:33 AM	4.41	20.18	1.27	0.72
11:34 AM	4.41	20.14	1.08	0.72
11:35 AM	4.45	20.15	1.02	0.72
11:36 AM	4.42	20.14	1.02	0.72
11:37 AM	4.36	20.12	1.05	0.72
11:38 AM	4.35	20.11	1.06	0.72
11:39 AM	4.43	20.10	1.07	0.72
11:40 AM	4.47	20.12	1.09	0.72
11:41 AM	4.39	20.19	1.09	0.72
11:42 AM	4.42	20.21	1.09	0.72
11:43 AM	4.40	20.14	1.09	0.72
11:44 AM	4.38	20.11	1.12	0.72
11:45 AM	4.38	20.10	1.13	0.72
11:46 AM	4.36	20.14	1.15	0.72
11:47 AM	4.36	20.16	1.16	0.72
11:48 AM	4.35	20.14	1.17	0.72
11:49 AM	4.36	20.16	1.17	0.72
11:50 AM	4.37	20.18	1.19	0.72
11:51 AM	4.36	20.16	1.21	0.72
11:52 AM	4.41	20.13	1.21	0.72
<b>Average</b>	4.39	20.15	1.12	0.72

Signature



Miss Katesarin Vorradetwittaya

Environmental Scientist





บริษัท ซีคอต จำกัด

SECOT CO., LTD.

239 ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพฯ 10800

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TEL : +66(0) 2959-3600 FAX : +66(0) 2959-3535 E-mail : envserv@secot.co.th

### STACK EMISSION ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REFERENCE NO.	: Refinery-223003-COA-Stk/PM
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING DATE	: 08/12/2023
RECEIVED DATE	: 11/12/2023	ANALYTICAL DATE	: 11-12/12/2023
REPORT DATE	: 14/12/2023	SAMPLE CONDITION	: Normal
STACK LOCATION	: NHTU/CCRU Stack	OPERATOR	: Mr. Song Hengchwankun
SOURCE DESCRIPTION	: Combustion	FUEL TYPE	: Natural Gas + Refinery Fuel Gas

#### STACK DESCRIPTION

Height	: 65.0	m	Gas Velocity	: 10.4	m/s
Diameter	: 3.1	m	Flow rate <sup>(1)</sup>	: 2,385	Ncu.m/min
Temperature	: 223.9	°C	Excess Oxygen	: 4.5	%

PARAMETER	UNIT	RESULTS <sup>(1)</sup>		ASSIGNED VALUE <sup>(2)</sup>	STANDARD <sup>(3)</sup>	REFERENCE METHODS
		4.5 % O <sub>2</sub>	7 % O <sub>2</sub>			
Particulate Matter	mg/Ncu.m	2.1	1.8	60	60	US. EPA Method 5

  
(Miss Pornnapa Budthum)

Analyst

REG.NO.จ-239-ท-0018

  
(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO.จ-239-ท-0010

**Remark :** 1. Reported analysis refers to submitted sample only.

2. This report shall not be reproduced, except in full, without official approval.

3. <sup>(1)</sup> At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. <sup>(2)</sup> Assigned value in EIA Report Expansion 3 of Refinery Plant, B.E. 2561 (2018).

5. <sup>(3)</sup> Notification of the Ministry of Natural Resources and Environment B.E.2554 (2011).



**The Monitoring Result of Emission Concentration**  
**NHTU**  
**STAR PETROLEUM REFINING PUBLIC CO.,LTD.**  
**December 8, 2023**

Run Number	Oxygen content (%)		Oxide of Nitrogen (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	4.58	4.62	36.97	37.00	31.59
2	4.46	4.50	37.22	37.25	31.57
3	4.47	4.51	37.33	37.36	31.68
<b>Average</b>	<b>4.50</b>	<b>4.54</b>	<b>37.18</b>	<b>37.20</b>	<b>31.62</b>

Run Number	Oxygen content (%)		Sulfur dioxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	4.58	4.62	1.02	0.96	0.82
2	4.46	4.50	0.96	0.91	0.77
3	4.47	4.51	1.12	1.07	0.91
<b>Average</b>	<b>4.50</b>	<b>4.54</b>	<b>1.03</b>	<b>0.98</b>	<b>0.83</b>

Run Number	Oxygen content (%)		Carbonmonoxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	4.58	4.62	0.60	0.58	0.50
2	4.46	4.50	0.59	0.57	0.48
3	4.47	4.51	0.55	0.53	0.45
<b>Average</b>	<b>4.50</b>	<b>4.54</b>	<b>0.58</b>	<b>0.56</b>	<b>0.48</b>

# STAR PETROLEUM REFINING PUBLIC CO.,LTD.

## EMISSION TEST RESULT

<b>Date:</b> December 8, 2023 <b>Start time:</b> 10:20 AM <b>O<sub>2</sub> instrument Model:</b> AMI 70 <b>NO<sub>x</sub> instrument Model:</b> TELEDYNE 200 EM <b>SO<sub>2</sub> instrument Model:</b> API 100 AH <b>CO instrument Model:</b> THERMO 48 C <b>Fuel Type :</b> Natural Gas	<b>Run # :</b> 1 <b>Location :</b> NHTU <b>Finish time :</b> 10:40 AM <b>Serial No.:</b> 161212-14 <b>Serial No.:</b> 435 <b>Serial No.:</b> 058 <b>Serial No.:</b> 412106049 <b>Test Operator :</b> Song H.
---	---

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
10:20 AM	4.56	36.89	1.02	0.69
10:21 AM	4.56	36.83	1.03	0.78
10:22 AM	4.59	36.83	0.85	0.58
10:23 AM	4.66	36.87	0.80	0.72
10:24 AM	4.62	36.86	0.84	0.61
10:25 AM	4.56	36.88	0.86	0.58
10:26 AM	4.58	37.00	0.88	0.58
10:27 AM	4.59	37.00	0.92	0.59
10:28 AM	4.62	37.01	0.94	0.60
10:29 AM	4.56	37.04	0.96	0.58
10:30 AM	4.55	36.95	0.99	0.58
10:31 AM	4.56	36.91	1.03	0.58
10:32 AM	4.52	36.99	1.05	0.58
10:33 AM	4.53	36.96	1.07	0.58
10:34 AM	4.58	36.87	1.08	0.58
10:35 AM	4.61	36.88	1.11	0.58
10:36 AM	4.61	37.00	1.13	0.58
10:37 AM	4.55	37.08	1.16	0.58
10:38 AM	4.55	37.10	1.19	0.58
10:39 AM	4.55	37.17	1.22	0.58
10:40 AM	4.58	37.27	1.22	0.58
<b>Average</b>	4.58	36.97	1.02	0.60

Signature



Miss Katesarin Vorradetwittaya

Environmental Scientist

# STAR PETROLEUM REFINING PUBLIC CO.,LTD.

## EMISSION TEST RESULT

<b>Date:</b> <u>December 8, 2023</u> <b>Start time:</b> <u>10:41 AM</u> <b>O<sub>2</sub> instrument Model:</b> <u>AMI 70</u> <b>NO<sub>x</sub> instrument Model:</b> <u>TELEDYNE 200 EM</u> <b>SO<sub>2</sub> instrument Model:</b> <u>API 100 AH</u> <b>CO instrument Model:</b> <u>THERMO 48 C</u> <b>Fuel Type :</b> <u>Natural Gas</u>	<b>Run # :</b> <u>2</u> <b>Location :</b> <u>NHTU</u> <b>Finish time :</b> <u>11:01 AM</u> <b>Serial No.:</b> <u>161212-14</u> <b>Serial No.:</b> <u>435</u> <b>Serial No.:</b> <u>058</u> <b>Serial No.:</b> <u>412106049</u> <b>Test Operator :</b> <u>Song H.</u>
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Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
10:41 AM	4.58	37.26	1.25	0.58
10:42 AM	4.60	37.25	1.27	0.58
10:43 AM	4.54	37.24	1.31	0.58
10:44 AM	4.43	37.20	1.32	0.70
10:45 AM	4.48	37.02	1.34	0.66
10:46 AM	4.54	37.00	0.71	0.61
10:47 AM	4.50	37.16	0.73	0.58
10:48 AM	4.54	37.24	0.76	0.58
10:49 AM	4.49	37.21	0.76	0.58
10:50 AM	4.47	37.12	0.80	0.58
10:51 AM	4.43	37.08	0.81	0.58
10:52 AM	4.31	37.09	0.82	0.54
10:53 AM	4.30	37.10	0.85	0.58
10:54 AM	4.30	37.10	0.88	0.58
10:55 AM	4.45	37.10	0.87	0.58
10:56 AM	4.47	37.27	0.90	0.58
10:57 AM	4.48	37.55	0.90	0.58
10:58 AM	4.42	37.68	0.93	0.59
10:59 AM	4.43	37.47	0.96	0.59
11:00 AM	4.47	37.25	0.98	0.59
11:01 AM	4.49	37.31	0.98	0.59
<b>Average</b>	4.46	37.22	0.96	0.59

Signature



Miss Katesarin Vorradetwittaya

Environmental Scientist

# STAR PETROLEUM REFINING PUBLIC CO.,LTD.

## EMISSION TEST RESULT

<b>Date:</b> December 8, 2023 <b>Start time:</b> 11:02 AM <b>O<sub>2</sub> instrument Model:</b> AMI 70 <b>NO<sub>x</sub> instrument Model:</b> TELEDYNE 200 EM <b>SO<sub>2</sub> instrument Model:</b> API 100 AH <b>CO instrument Model:</b> THERMO 48 C <b>Fuel Type :</b> Natural Gas	<b>Run # :</b> 3 <b>Location :</b> NHTU <b>Finish time :</b> 11:22 AM <b>Serial No.:</b> 161212-14 <b>Serial No.:</b> 435 <b>Serial No.:</b> 058 <b>Serial No.:</b> 412106049 <b>Test Operator :</b> Song H.
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Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
11:02 AM	4.51	37.46	1.01	0.56
11:03 AM	4.59	37.53	1.02	0.56
11:04 AM	4.55	37.50	1.03	0.60
11:05 AM	4.47	37.43	1.06	0.60
11:06 AM	4.40	37.37	1.09	0.60
11:07 AM	4.50	37.29	1.11	0.52
11:08 AM	4.52	37.25	1.12	0.59
11:09 AM	4.45	37.30	1.13	0.61
11:10 AM	4.42	37.34	1.14	0.58
11:11 AM	4.33	37.28	1.16	0.61
11:12 AM	4.35	37.17	1.18	0.43
11:13 AM	4.42	37.13	1.20	0.50
11:14 AM	4.48	37.22	1.21	0.61
11:15 AM	4.54	37.24	1.22	0.61
11:16 AM	4.57	37.34	1.25	0.51
11:17 AM	4.52	37.41	1.25	0.61
11:18 AM	4.58	37.37	1.28	0.43
11:19 AM	4.50	37.47	0.99	0.42
11:20 AM	4.41	37.47	0.99	0.50
11:21 AM	4.41	37.28	1.02	0.53
11:22 AM	4.36	37.13	1.03	0.50
<b>Average</b>	4.47	37.33	1.12	0.55

Signature



Miss Katesarin Vorradetwittaya

Environmental Scientist





บริษัท ซีคอต จำกัด

SECOT CO., LTD.

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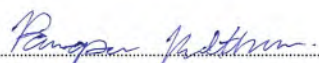
### STACK EMISSION ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REFERENCE NO.	: Refinery-223003-COA-Stk/PM
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING DATE	: 07/12/2023
RECEIVED DATE	: 08/12/2023	ANALYTICAL DATE	: 11-12/12/2023
REPORT DATE	: 14/12/2023	SAMPLE CONDITION	: Normal
STACK LOCATION	: DHTU Stack	OPERATOR	: Mr. Song Hengchwankun
SOURCE DESCRIPTION	: Combustion	FUEL TYPE	: Natural Gas + Refinery Fuel Gas

#### STACK DESCRIPTION

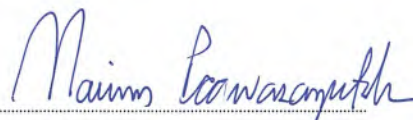
Height	: 36.2	m	Gas Velocity	: 5.5	m/s
Diameter	: 1.6	m	Flow rate <sup>(1)</sup>	: 271.4	Ncu.m/min
Temperature	: 340.5	°C	Excess Oxygen	: 4.3	%

PARAMETER	UNIT	RESULTS <sup>(1)</sup>		ASSIGNED VALUE <sup>(2)</sup>	STANDARD <sup>(3)</sup>	REFERENCE METHODS
		4.3 % O <sub>2</sub>	7 % O <sub>2</sub>			
Particulate Matter	mg/Ncu.m	7.0	5.9	60	60	US. EPA Method 5

  
(Miss Pornnapa Budthum)

Analyst

REG.NO.จ-239-ท-0018

  
(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO.จ-239-ท-0010

**Remark :** 1. Reported analysis refers to submitted sample only.

2. This report shall not be reproduced, except in full, without official approval.

3. <sup>(1)</sup> At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. <sup>(2)</sup> Assigned value in EIA Report Expansion 3 of Refinery Plant, B.E. 2561 (2018).

5. <sup>(3)</sup> Notification of the Ministry of Natural Resources and Environment B.E.2554 (2011).

**The Monitoring Result of Emission Concentration**  
**DHTU**  
**STAR PETROLEUM REFINING PUBLIC CO.,LTD.**  
**December 7, 2023**

Run Number	Oxygen content (%)		Oxide of Nitrogen (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	4.58	4.58	38.53	38.50	32.79
2	4.30	4.41	38.56	38.82	32.72
3	3.87	3.87	38.14	38.11	31.11
Average	4.25	4.29	38.41	38.48	32.19

Run Number	Oxygen content (%)		Sulfur dioxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	4.58	4.58	2.62	2.55	2.17
2	4.30	4.41	3.69	3.46	2.92
3	3.87	3.87	3.95	4.00	3.26
Average	4.25	4.29	3.42	3.34	2.79


Run Number	Oxygen content (%)		Carbonmonoxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	4.58	4.58	0.77	0.71	0.60
2	4.30	4.41	0.30	0.17	0.14
3	3.87	3.87	0.22	0.15	0.12
Average	4.25	4.29	0.43	0.34	0.29

# STAR PETROLEUM REFINING PUBLIC CO.,LTD.

## EMISSION TEST RESULT

<b>Date:</b> December 7, 2023 <b>Start time:</b> 11:20 AM <b>O<sub>2</sub> instrument Model:</b> AMI 70 <b>NO<sub>x</sub> instrument Model:</b> TELEDYNE 200 EM <b>SO<sub>2</sub> instrument Model:</b> API 100 AH <b>CO instrument Model:</b> API 300 A <b>Fuel Type :</b> Natural Gas	<b>Run # :</b> 1 <b>Location :</b> DHTU <b>Finish time :</b> 11:40 AM <b>Serial No.:</b> 161212-14 <b>Serial No.:</b> 435 <b>Serial No.:</b> 058 <b>Serial No.:</b> 1070 <b>Test Operator :</b> Kittipong T.
---	---

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
11:20 AM	4.81	38.22	1.63	0.09
11:21 AM	4.77	38.11	1.55	1.14
11:22 AM	4.90	37.71	1.76	1.19
11:23 AM	4.76	37.66	1.91	1.98
11:24 AM	4.74	37.70	2.10	1.06
11:25 AM	4.76	37.75	2.34	1.26
11:26 AM	4.65	37.83	2.59	1.11
11:27 AM	4.61	37.99	2.66	0.94
11:28 AM	4.54	38.38	2.75	0.86
11:29 AM	4.50	38.73	2.78	0.74
11:30 AM	4.53	38.85	2.78	0.65
11:31 AM	4.61	38.92	2.86	0.66
11:32 AM	4.51	39.01	2.95	0.65
11:33 AM	4.54	39.08	2.93	0.61
11:34 AM	4.42	39.17	3.01	0.47
11:35 AM	4.43	39.11	3.00	0.57
11:36 AM	4.28	38.73	3.01	0.69
11:37 AM	4.56	38.66	3.10	0.50
11:38 AM	4.43	39.07	3.06	0.29
11:39 AM	4.40	39.22	3.07	0.34
11:40 AM	4.48	39.29	3.20	0.46
<b>Average</b>	4.58	38.53	2.62	0.77


Signature   
 Miss Katesarin Vorradetwittaya  
 Environmental Scientist

# STAR PETROLEUM REFINING PUBLIC CO.,LTD.

## EMISSION TEST RESULT

<b>Date:</b> December 7, 2023 <b>Start time:</b> 11:41 AM <b>O<sub>2</sub> instrument Model:</b> AMI 70 <b>NO<sub>x</sub> instrument Model:</b> TELEDYNE 200 EM <b>SO<sub>2</sub> instrument Model:</b> API 100 AH <b>CO instrument Model:</b> API 300 A <b>Fuel Type :</b> Natural Gas	<b>Run # :</b> 2 <b>Location :</b> DHTU <b>Finish time :</b> 12:01 PM <b>Serial No.:</b> 161212-14 <b>Serial No.:</b> 435 <b>Serial No.:</b> 058 <b>Serial No.:</b> 1070 <b>Test Operator :</b> Kittipong T.
---	---

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
11:41 AM	4.54	39.51	3.23	0.46
11:42 AM	4.53	39.24	3.27	0.46
11:43 AM	4.31	38.73	3.26	0.40
11:44 AM	4.24	38.59	3.29	0.37
11:45 AM	4.23	38.49	3.35	0.42
11:46 AM	4.16	38.46	3.34	0.09
11:47 AM	4.43	38.62	3.38	0.02
11:48 AM	4.47	38.83	3.42	1.01
11:49 AM	4.44	38.85	3.34	0.11
11:50 AM	4.28	38.60	3.46	0.39
11:51 AM	4.33	38.42	3.45	0.11
11:52 AM	4.42	38.57	3.45	0.22
11:53 AM	4.39	38.89	3.49	0.26
11:54 AM	4.45	39.21	3.52	0.22
11:55 AM	4.42	39.35	3.53	0.26
11:56 AM	4.44	39.05	3.58	0.25
11:57 AM	4.42	38.75	3.58	0.25
11:58 AM	4.37	38.67	3.58	0.29
12:25 PM	3.82	37.09	5.79	0.22
12:26 PM	3.80	37.12	5.35	0.22
12:27 PM	3.76	36.70	4.86	0.22
<b>Average</b>	4.30	38.56	3.69	0.30

Signature   
 Miss Katesarin Vorradetwittaya  
 Environmental Scientist



# STAR PETROLEUM REFINING PUBLIC CO.,LTD.

## EMISSION TEST RESULT

<b>Date:</b> December 7, 2023 <b>Start time:</b> 12:28 PM <b>O<sub>2</sub> instrument Model:</b> AMI 70 <b>NO<sub>x</sub> instrument Model:</b> TELEDYNE 200 EM <b>SO<sub>2</sub> instrument Model:</b> API 100 AH <b>CO instrument Model:</b> API 300 A <b>Fuel Type :</b> Natural Gas	<b>Run # :</b> 3 <b>Location :</b> DHTU <b>Finish time :</b> 12:48 PM <b>Serial No.:</b> 161212-14 <b>Serial No.:</b> 435 <b>Serial No.:</b> 058 <b>Serial No.:</b> 1070 <b>Test Operator :</b> Kittipong T.
---	---

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
12:28 PM	3.87	36.49	4.64	0.22
12:29 PM	3.86	36.95	4.44	0.21
12:30 PM	3.94	37.68	4.40	0.21
12:31 PM	3.90	38.04	4.31	0.21
12:32 PM	3.88	38.05	4.17	0.22
12:33 PM	3.89	38.00	4.13	0.22
12:34 PM	3.90	38.00	4.05	0.21
12:35 PM	4.00	38.02	4.04	0.22
12:36 PM	3.89	37.68	4.00	0.21
12:37 PM	3.70	37.35	3.78	0.22
12:38 PM	3.83	37.50	3.90	0.22
12:39 PM	3.74	38.00	3.77	0.21
12:40 PM	3.70	38.28	3.77	0.22
12:41 PM	3.84	38.38	3.78	0.22
12:42 PM	3.89	38.64	3.69	0.22
12:43 PM	4.01	38.76	3.75	0.22
12:44 PM	3.80	38.65	3.66	0.22
12:45 PM	3.97	38.88	3.64	0.22
12:46 PM	3.90	39.20	3.68	0.22
12:47 PM	3.97	39.22	3.68	0.22
12:48 PM	3.85	39.09	3.60	0.22
<b>Average</b>	3.87	38.14	3.95	0.22

Signature



Miss Katesarin Vorradetwittaya

Environmental Scientist



บริษัท ซีคอต จำกัด

SECOT CO., LTD.

239 ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพฯ 10800

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TEL : +66(0) 2959-3600 FAX : +66(0) 2959-3535 E-mail : envserv@secot.co.th

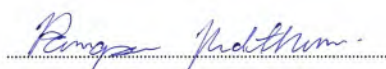
### STACK EMISSION ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REFERENCE NO.	: Refinery-223003-COA-Stk/PM
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING DATE	: 07/12/2023
RECEIVED DATE	: 08/12/2023	ANALYTICAL DATE	: 11-12/12/2023
REPORT DATE	: 14/12/2023	SAMPLE CONDITION	: Normal
STACK LOCATION	: HVGO-HTU Stack	OPERATOR	: Mr. Song Hengchwankun
SOURCE DESCRIPTION	: Combustion	FUEL TYPE	: Natural Gas + Refinery Fuel Gas

#### STACK DESCRIPTION

Height	: 36.2	m	Gas Velocity	: 5.0	m/s
Diameter	: 1.6	m	Flow rate <sup>(1)</sup>	: 201.4	Ncu.m/min
Temperature	: 411.7	°C	Excess Oxygen	: 5.8	%

PARAMETER	UNIT	RESULTS <sup>(1)</sup>		ASSIGNED VALUE <sup>(2)</sup>	STANDARD <sup>(3)</sup>	REFERENCE METHODS
		5.8 % O <sub>2</sub>	7 % O <sub>2</sub>			
Particulate Matter	mg/Ncu.m	2.5	2.3	60	60	US. EPA Method 5



(Miss Pornnapa Budthum)

Analyst

REG.NO.จ-239-จ-0018



(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO.จ-239-ค-0010

**Remark :** 1. Reported analysis refers to submitted sample only.

2. This report shall not be reproduced, except in full, without official approval.

3. <sup>(1)</sup> At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. <sup>(2)</sup> Assigned value in EIA Report Expansion 3 of Refinery Plant, B.E. 2561 (2018).

5. <sup>(3)</sup> Notification of the Ministry of Natural Resources and Environment B.E.2554 (2011).

**The Monitoring Result of Emission Concentration  
HVGO  
STAR PETROLEUM REFINING PUBLIC CO.,LTD.  
December 7, 2023**

Run Number	Oxygen content (%)		Oxide of Nitrogen (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	6.16	6.18	49.19	49.17	46.43
2	5.54	5.55	50.69	51.03	46.21
3	5.63	5.65	50.43	49.97	45.55
<b>Average</b>	<b>5.78</b>	<b>5.79</b>	<b>50.10</b>	<b>50.06</b>	<b>46.06</b>

Run Number	Oxygen content (%)		Sulfur dioxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	6.16	6.18	1.15	1.09	1.03
2	5.54	5.55	2.29	2.06	1.87
3	5.63	5.65	2.56	2.65	2.42
<b>Average</b>	<b>5.78</b>	<b>5.79</b>	<b>2.00</b>	<b>1.93</b>	<b>1.78</b>

Run Number	Oxygen content (%)		Carbonmonoxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	6.16	6.18	0.22	0.18	0.17
2	5.54	5.55	0.35	0.35	0.32
3	5.63	5.65	0.11	0.06	0.05
<b>Average</b>	<b>5.78</b>	<b>5.79</b>	<b>0.23</b>	<b>0.20</b>	<b>0.18</b>

# STAR PETROLEUM REFINING PUBLIC CO.,LTD.

## EMISSION TEST RESULT

<b>Date:</b> <u>December 7, 2023</u> <b>Start time:</b> <u>11:20 AM</u> <b>O<sub>2</sub> instrument Model:</b> <u>AMI 70</u> <b>NO<sub>x</sub> instrument Model:</b> <u>API 200 AH</u> <b>SO<sub>2</sub> instrument Model:</b> <u>API 100 AH</u> <b>CO instrument Model:</b> <u>THERMO 48 C</u> <b>Fuel Type :</b> <u>Natural Gas</u>	<b>Run # :</b> <u>1</u> <b>Location :</b> <u>HVGO</u> <b>Finish time :</b> <u>11:40 AM</u> <b>Serial No.:</b> <u>111117-2</u> <b>Serial No.:</b> <u>441</u> <b>Serial No.:</b> <u>060</u> <b>Serial No.:</b> <u>388</u> <b>Test Operator :</b> <u>Kittipong T.</u>
---	---

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
11:20 AM	6.39	47.43	0.50	0.03
11:21 AM	6.40	47.09	0.43	0.17
11:22 AM	6.39	47.21	0.53	0.00
11:23 AM	6.38	47.22	0.65	0.07
11:24 AM	6.26	47.69	0.71	0.07
11:25 AM	6.32	48.06	0.83	0.24
11:26 AM	6.27	48.49	0.88	0.27
11:27 AM	6.17	48.69	0.98	0.27
11:28 AM	6.16	48.91	1.07	0.27
11:29 AM	6.14	49.18	1.15	0.27
11:30 AM	6.14	49.43	1.16	0.27
11:31 AM	6.17	49.84	1.24	0.27
11:32 AM	6.16	49.94	1.34	0.27
11:33 AM	6.17	50.01	1.34	0.27
11:34 AM	6.07	50.21	1.43	0.27
11:35 AM	6.10	50.53	1.48	0.27
11:36 AM	6.07	50.40	1.54	0.27
11:37 AM	5.99	50.54	1.65	0.27
11:38 AM	5.96	50.70	1.70	0.27
11:39 AM	5.83	50.58	1.75	0.27
11:40 AM	5.81	50.89	1.76	0.27
<b>Average</b>	6.16	49.19	1.15	0.22

Signature



Miss Katesarin Vorradetwittaya

Environmental Scientist



# STAR PETROLEUM REFINING PUBLIC CO.,LTD.

## EMISSION TEST RESULT

<b>Date:</b> December 7, 2023 <b>Start time:</b> 11:41 AM <b>O<sub>2</sub> instrument Model:</b> AMI 70 <b>NO<sub>x</sub> instrument Model:</b> API 200 AH <b>SO<sub>2</sub> instrument Model:</b> API 100 AH <b>CO instrument Model:</b> THERMO 48 C <b>Fuel Type :</b> Natural Gas	<b>Run # :</b> 2 <b>Location :</b> HVGO <b>Finish time :</b> 12:01 PM <b>Serial No.:</b> 111117-2 <b>Serial No.:</b> 441 <b>Serial No.:</b> 060 <b>Serial No.:</b> 388 <b>Test Operator :</b> Kittipong T.
--	---

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
11:41 AM	5.69	51.11	1.85	0.27
11:42 AM	5.63	51.01	1.92	0.27
11:43 AM	5.60	50.81	1.93	0.27
11:44 AM	5.47	50.87	1.99	0.27
11:45 AM	5.50	51.01	2.03	0.27
11:46 AM	5.52	51.01	2.05	0.27
11:47 AM	5.45	51.21	2.07	0.27
11:48 AM	5.53	51.08	2.08	0.44
11:49 AM	5.46	50.98	2.13	0.48
11:50 AM	5.47	50.95	2.17	0.48
11:51 AM	5.48	50.93	2.26	0.48
11:52 AM	5.55	50.93	2.16	0.48
11:53 AM	5.52	51.08	2.23	0.48
11:54 AM	5.50	51.26	2.28	0.48
11:55 AM	5.50	51.11	2.28	0.48
11:56 AM	5.60	51.12	2.30	0.48
11:57 AM	5.55	51.20	2.23	0.48
11:58 AM	5.58	51.30	2.23	0.48
12:25 PM	5.64	48.57	3.51	0.10
12:26 PM	5.56	48.46	3.33	0.11
12:27 PM	5.61	48.42	3.16	0.11
<b>Average</b>	5.54	50.69	2.29	0.35

Signature



Miss Katesarin Vorradetwittaya

Environmental Scientist

# STAR PETROLEUM REFINING PUBLIC CO.,LTD.

## EMISSION TEST RESULT

<b>Date:</b> <u>December 7, 2023</u> <b>Start time:</b> <u>12:28 PM</u> <b>O<sub>2</sub> instrument Model:</b> <u>AMI 70</u> <b>NO<sub>x</sub> instrument Model:</b> <u>API 200 AH</u> <b>SO<sub>2</sub> instrument Model:</b> <u>API 100 AH</u> <b>CO instrument Model:</b> <u>THERMO 48 C</u> <b>Fuel Type :</b> <u>Natural Gas</u>	<b>Run # :</b> <u>3</u> <b>Location :</b> <u>HVGO</u> <b>Finish time :</b> <u>12:48 PM</u> <b>Serial No.:</b> <u>111117-2</u> <b>Serial No.:</b> <u>441</u> <b>Serial No.:</b> <u>060</u> <b>Serial No.:</b> <u>388</u> <b>Test Operator :</b> <u>Kittipong T.</u>
---	---

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
12:28 PM	5.76	48.43	3.04	0.11
12:29 PM	5.77	48.29	2.91	0.10
12:30 PM	5.81	48.57	2.87	0.10
12:31 PM	5.78	49.26	2.80	0.10
12:32 PM	5.66	49.50	2.70	0.11
12:33 PM	5.61	49.89	2.74	0.11
12:34 PM	5.58	50.32	2.64	0.10
12:35 PM	5.48	50.31	2.61	0.10
12:36 PM	5.56	50.31	2.55	0.10
12:37 PM	5.59	50.23	2.47	0.11
12:38 PM	5.59	50.28	2.46	0.11
12:39 PM	5.55	50.72	2.46	0.10
12:40 PM	5.48	51.01	2.45	0.11
12:41 PM	5.64	51.16	2.43	0.11
12:42 PM	5.72	51.26	2.46	0.11
12:43 PM	5.65	51.45	2.47	0.11
12:44 PM	5.52	51.55	2.38	0.11
12:45 PM	5.60	51.81	2.38	0.11
12:46 PM	5.58	51.50	2.39	0.11
12:47 PM	5.59	51.57	2.37	0.11
12:48 PM	5.75	51.69	2.28	0.11
<b>Average</b>	5.63	50.43	2.56	0.11

Signature



Miss Katesarin Vorradetwittaya

Environmental Scientist



บริษัท ซีคอต จำกัด

SECOT CO., LTD.

239 ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพฯ 10800

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TEL : +66(0) 2959-3600 FAX : +66(0) 2959-3535 E-mail : envserv@secot.co.th

### STACK EMISSION ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REFERENCE NO.	: Refinery-223003-COA-Stk/PM
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING DATE	: 07/12/2023
RECEIVED DATE	: 08/12/2023	ANALYTICAL DATE	: 11-12/12/2023
REPORT DATE	: 14/12/2023	SAMPLE CONDITION	: Normal
STACK LOCATION	: WCN-HTU Stack	OPERATOR	: Mr. Song Hengchwankun
SOURCE DESCRIPTION	: Combustion	FUEL TYPE	: Natural Gas + Refinery Fuel Gas

#### STACK DESCRIPTION


Height	: 32.5	m	Gas Velocity	: 4.9	m/s
Diameter	: 0.86	m	Flow rate <sup>(1)</sup>	: 80.2	Ncu.m/min
Temperature	: 277.5	°C	Excess Oxygen	: 4.5	%

PARAMETER	UNIT	RESULTS <sup>(1)</sup>		ASSIGNED VALUE <sup>(2)</sup>	STANDARD <sup>(3)</sup>	REFERENCE METHODS
		4.5 % O <sub>2</sub>	7 % O <sub>2</sub>			
Particulate Matter	mg/Ncu.m	7.9	6.7	35	60	US. EPA Method 5

  
(Miss Pornnapa Budthum)

Analyst

REG.NO.จ-239-ท-0018

  
(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO.จ-239-ท-0010

**Remark :** 1. Reported analysis refers to submitted sample only.

2. This report shall not be reproduced, except in full, without official approval.

3. <sup>(1)</sup> At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. <sup>(2)</sup> Assigned value in EIA Report Expansion 3 of Refinery Plant, B.E. 2561 (2018).

5. <sup>(3)</sup> Notification of the Ministry of Natural Resources and Environment B.E.2554 (2011).

**The Monitoring Result of Emission Concentration**  
**WCN-HTU**  
**STAR PETROLEUM REFINING PUBLIC CO.,LTD.**  
**December 7, 2023**

Run Number	Oxygen content (%)		Oxide of Nitrogen (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	4.78	4.79	10.03	9.98	8.61
2	4.44	4.44	10.21	10.16	8.58
3	4.16	4.16	9.56	9.51	7.90
<b>Average</b>	<b>4.46</b>	<b>4.46</b>	<b>9.93</b>	<b>9.88</b>	<b>8.36</b>

Run Number	Oxygen content (%)		Sulfur dioxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	4.78	4.79	2.05	1.99	1.72
2	4.44	4.44	2.22	2.16	1.82
3	4.16	4.16	2.27	2.20	1.83
<b>Average</b>	<b>4.46</b>	<b>4.46</b>	<b>2.18</b>	<b>2.12</b>	<b>1.79</b>

Run Number	Oxygen content (%)		Carbonmonoxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	4.78	4.79	1.86	1.80	1.55
2	4.44	4.44	12.85	12.78	10.79
3	4.16	4.16	49.46	49.42	41.04
<b>Average</b>	<b>4.46</b>	<b>4.46</b>	<b>21.39</b>	<b>21.33</b>	<b>18.04</b>



## STAR PETROLEUM REFINING PUBLIC CO.,LTD. EMISSION TEST RESULT

<b>Date:</b> December 7, 2023 <b>Start time:</b> 2:30 PM <b>O<sub>2</sub> instrument Model:</b> AMI 70 <b>NO<sub>x</sub> instrument Model:</b> API 200 AH <b>SO<sub>2</sub> instrument Model:</b> API 100 AH <b>CO instrument Model:</b> THERMO 48 C <b>Fuel Type :</b> Natural Gas	<b>Run # :</b> 1 <b>Location :</b> WCN-HTU <b>Finish time :</b> 2:50 PM <b>Serial No.:</b> 111117-2 <b>Serial No.:</b> 441 <b>Serial No.:</b> 060 <b>Serial No.:</b> 388 <b>Test Operator :</b> Kittipong T.
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Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
2:30 PM	5.19	10.15	1.79	0.40
2:31 PM	5.01	10.09	1.85	0.40
2:32 PM	5.05	9.93	1.89	0.42
2:33 PM	5.09	9.98	1.72	0.46
2:34 PM	4.95	9.91	1.53	0.41
2:35 PM	4.88	9.75	1.78	0.49
2:36 PM	4.91	9.64	1.98	0.61
2:37 PM	4.82	9.46	2.07	0.72
2:38 PM	4.83	9.57	2.13	0.89
2:39 PM	4.74	9.67	2.12	1.17
2:40 PM	4.74	9.93	2.15	1.42
2:41 PM	4.68	10.06	2.15	1.79
2:42 PM	4.67	10.00	2.19	2.18
2:43 PM	4.65	9.94	2.18	2.50
2:44 PM	4.79	10.15	2.20	2.45
2:45 PM	4.64	10.54	2.23	2.47
2:46 PM	4.62	10.49	2.25	2.87
2:47 PM	4.56	10.38	2.21	3.51
2:48 PM	4.54	10.52	2.22	3.49
2:49 PM	4.55	10.32	2.23	4.35
2:50 PM	4.53	10.20	2.19	6.09
<b>Average</b>	4.78	10.03	2.05	1.86

Signature



Miss Katesarin Vorradetwittaya

Environmental Scientist

# STAR PETROLEUM REFINING PUBLIC CO.,LTD.

## EMISSION TEST RESULT

<b>Date:</b> December 7, 2023 <b>Start time:</b> 2:51 PM <b>O<sub>2</sub> instrument Model:</b> AMI 70 <b>NO<sub>x</sub> instrument Model:</b> API 200 AH <b>SO<sub>2</sub> instrument Model:</b> API 100 AH <b>CO instrument Model:</b> THERMO 48 C <b>Fuel Type :</b> Natural Gas	<b>Run # :</b> 2 <b>Location :</b> WCN-HTU <b>Finish time :</b> 3:11 PM <b>Serial No.:</b> 111117-2 <b>Serial No.:</b> 441 <b>Serial No.:</b> 060 <b>Serial No.:</b> 388 <b>Test Operator :</b> Kittipong T.
---	---

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
2:51 PM	4.55	10.38	2.21	6.39
2:52 PM	4.55	10.36	2.21	6.07
2:53 PM	4.63	10.41	2.24	6.47
2:54 PM	4.61	10.68	2.22	5.98
2:55 PM	4.49	10.52	2.22	4.97
2:56 PM	4.52	10.22	2.21	6.05
2:57 PM	4.52	10.09	2.21	7.06
2:58 PM	4.43	10.50	2.17	8.97
2:59 PM	4.40	10.24	2.19	12.18
3:00 PM	4.41	10.26	2.18	14.00
3:01 PM	4.37	10.10	2.21	15.23
3:02 PM	4.34	10.06	2.18	16.77
3:03 PM	4.44	10.11	2.22	16.94
3:04 PM	4.42	10.00	2.19	16.87
3:05 PM	4.40	10.06	2.17	17.90
3:06 PM	4.39	10.07	2.24	17.48
3:07 PM	4.40	10.08	2.25	16.78
3:08 PM	4.32	10.00	2.26	17.53
3:09 PM	4.27	10.14	2.24	19.13
3:10 PM	4.37	9.96	2.28	19.09
3:11 PM	4.39	10.12	2.30	17.91
<b>Average</b>	4.44	10.21	2.22	12.85

Signature



Miss Katesarin Vorradetwittaya

Environmental Scientist

# STAR PETROLEUM REFINING PUBLIC CO.,LTD.

## EMISSION TEST RESULT

<b>Date:</b> <u>December 7, 2023</u> <b>Start time:</b> <u>3:12 PM</u> <b>O<sub>2</sub> instrument Model:</b> <u>AMI 70</u> <b>NO<sub>x</sub> instrument Model:</b> <u>API 200 AH</u> <b>SO<sub>2</sub> instrument Model:</b> <u>API 100 AH</u> <b>CO instrument Model:</b> <u>THERMO 48 C</u> <b>Fuel Type :</b> <u>Natural Gas</u>	<b>Run # :</b> <u>3</u> <b>Location :</b> <u>WCN-HTU</u> <b>Finish time :</b> <u>3:32 PM</u> <b>Serial No.:</b> <u>111117-2</u> <b>Serial No.:</b> <u>441</u> <b>Serial No.:</b> <u>060</u> <b>Serial No.:</b> <u>388</u> <b>Test Operator :</b> <u>Kittipong T.</u>
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Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
3:12 PM	4.34	10.25	2.25	17.95
3:13 PM	4.28	10.17	2.28	18.21
3:14 PM	4.32	9.90	2.24	18.28
3:15 PM	4.26	9.80	2.18	21.56
3:16 PM	4.24	9.80	2.23	26.86
3:17 PM	4.19	9.80	2.26	32.53
3:18 PM	4.21	9.68	2.30	37.22
3:19 PM	4.16	9.65	2.26	41.33
3:20 PM	4.22	9.55	2.23	45.04
3:21 PM	4.18	9.55	2.25	49.60
3:22 PM	4.13	9.49	2.29	53.94
3:23 PM	4.12	9.62	2.24	58.49
3:24 PM	4.15	9.24	2.26	60.79
3:25 PM	4.24	9.26	2.29	56.53
3:26 PM	4.12	9.55	2.24	52.66
3:27 PM	4.08	9.76	2.31	52.66
3:28 PM	4.00	9.29	2.27	57.18
3:29 PM	3.97	8.90	2.28	64.07
3:30 PM	4.04	8.98	2.33	81.78
3:31 PM	4.10	9.18	2.29	90.86
3:32 PM	3.93	9.41	2.34	101.05
<b>Average</b>	4.16	9.56	2.27	49.46

Signature



Miss Katesarin Vorradetwittaya

Environmental Scientist





บริษัท ซีคอต จำกัด

SECOT CO., LTD.

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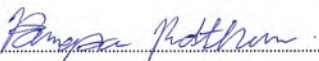
### STACK EMISSION ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REFERENCE NO.	: Refinery-223003-COA-Stk/PM
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING DATE	: 06/12/2023
RECEIVED DATE	: 08/12/2023	ANALYTICAL DATE	: 11-12/12/2023
REPORT DATE	: 14/12/2023	SAMPLE CONDITION	: Normal
STACK LOCATION	: Boiler#3 Stack	OPERATOR	: Mr. Kittipong Thakoengsuk
SOURCE DESCRIPTION	: Combustion	FUEL TYPE	: Natural Gas + Refinery Fuel Gas

#### STACK DESCRIPTION


Height	: 32.4	m	Gas Velocity	: 8.1	m/s
Diameter	: 1.5	m	Flow rate <sup>(1)</sup>	: 543.4	Ncu.m/min
Temperature	: 150.6	°C	Excess Oxygen	: 6.4	%

PARAMETER	UNIT	RESULTS <sup>(1)</sup>		ASSIGNED VALUE <sup>(2)</sup>	STANDARD <sup>(3)</sup>	REFERENCE METHODS
		6.4 % O <sub>2</sub>	7 % O <sub>2</sub>			
Particulate Matter	mg/Ncu.m	2.6	2.5	60	60	US. EPA Method 5

  
(Miss Pornnapa Budthum)

Analyst

REG.NO.จ-239-จ-0018

  
(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO.จ-239-ท-0010

**Remark :** 1. Reported analysis refers to submitted sample only.

2. This report shall not be reproduced, except in full, without official approval.

3. <sup>(1)</sup> At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. <sup>(2)</sup> Assigned value in EIA Report Expasion 3 of Refinery Plant, B.E. 2561 (2018).

5. <sup>(3)</sup> Notification of the Ministry of Natural Resources and Environment B.E.2554 (2011).



**The Monitoring Result of Emission Concentration**  
**Boiler 3**  
**STAR PETROLEUM REFINING PUBLIC CO.,LTD.**  
**December 6, 2023**

Run Number	Oxygen content (%)		Oxide of Nitrogen (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	6.45	6.46	36.04	36.08	34.73
2	6.26	6.24	36.75	36.79	34.88
3	6.39	6.34	36.72	36.75	35.08
<b>Average</b>	<b>6.37</b>	<b>6.35</b>	<b>36.50</b>	<b>36.54</b>	<b>34.90</b>

Run Number	Oxygen content (%)		Sulfur dioxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	6.45	6.46	1.39	1.32	1.27
2	6.26	6.24	1.15	1.08	1.02
3	6.39	6.34	1.15	1.09	1.04
<b>Average</b>	<b>6.37</b>	<b>6.35</b>	<b>1.23</b>	<b>1.16</b>	<b>1.11</b>

Run Number	Oxygen content (%)		Carbonmonoxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	6.45	6.46	1.09	1.05	1.01
2	6.26	6.24	1.07	1.03	0.98
3	6.39	6.34	1.05	1.02	0.97
<b>Average</b>	<b>6.37</b>	<b>6.35</b>	<b>1.07</b>	<b>1.03</b>	<b>0.99</b>

# STAR PETROLEUM REFINING PUBLIC CO.,LTD.

## EMISSION TEST RESULT

Run # : 1

Date: December 6, 2023

Location : Boiler 3

Start time: 11:00 AM

Finish time : 11:20 AM

O<sub>2</sub> instrument Model: AMI 70

Serial No.: 161212-14

NO<sub>x</sub> instrument Model: Teledyne 200 EM

Serial No.: 435

SO<sub>2</sub> instrument Model: API 100 AH

Serial No.: 058

CO instrument Model: THERMO 48 C

Serial No.: 412106049

Fuel Type : Natural Gas

Test Operator : Pisanu S.

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
11:00 AM	6.53	35.70	1.61	1.11
11:01 AM	6.55	36.04	1.54	1.08
11:02 AM	6.82	35.93	1.54	1.15
11:03 AM	6.83	35.52	1.53	1.12
11:04 AM	6.62	35.42	1.48	1.12
11:05 AM	6.47	35.38	1.43	1.10
11:06 AM	6.45	35.38	1.44	1.13
11:07 AM	6.74	35.40	1.40	1.12
11:08 AM	6.63	35.56	1.39	1.05
11:09 AM	6.55	35.65	1.36	1.11
11:10 AM	6.47	35.63	1.37	1.04
11:11 AM	6.19	35.85	1.28	1.06
11:12 AM	6.32	36.33	1.35	1.04
11:13 AM	6.22	36.58	1.33	1.09
11:14 AM	6.10	36.69	1.32	1.08
11:15 AM	6.17	36.78	1.35	1.01
11:16 AM	6.25	36.84	1.32	1.05
11:17 AM	6.43	36.65	1.28	1.10
11:18 AM	6.42	36.49	1.29	1.08
11:19 AM	6.37	36.54	1.24	1.13
11:20 AM	6.33	36.51	1.24	1.13
Average	6.45	36.04	1.39	1.09

Signature



Miss Katesarin Vorradetwittaya

Environmental Scientist

# STAR PETROLEUM REFINING PUBLIC CO.,LTD.

## EMISSION TEST RESULT

<b>Date:</b> December 6, 2023 <b>Start time:</b> 11:21 AM <b>O<sub>2</sub> instrument Model:</b> AMI 70 <b>NO<sub>x</sub> instrument Model:</b> Teledyne 200 EM <b>SO<sub>2</sub> instrument Model:</b> API 100 AH <b>CO instrument Model:</b> THERMO 48 C <b>Fuel Type :</b> Natural Gas	<b>Run # :</b> 2 <b>Location :</b> Boiler 3 <b>Finish time :</b> 11:41 AM <b>Serial No.:</b> 161212-14 <b>Serial No.:</b> 435 <b>Serial No.:</b> 058 <b>Serial No.:</b> 412106049 <b>Test Operator :</b> Pisanu S.
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Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
11:21 AM	6.21	36.59	1.21	1.07
11:22 AM	6.23	36.62	1.20	1.14
11:23 AM	6.30	36.59	1.17	1.05
11:24 AM	6.45	36.58	1.19	1.08
11:25 AM	6.58	36.59	1.20	1.10
11:26 AM	6.46	36.83	1.18	1.05
11:27 AM	6.10	36.59	1.16	1.05
11:28 AM	6.15	36.78	1.15	1.17
11:29 AM	6.05	36.82	1.14	1.10
11:30 AM	6.22	36.92	1.16	1.05
11:31 AM	6.35	36.91	1.16	1.05
11:32 AM	6.39	36.81	1.19	1.08
11:33 AM	6.46	36.82	1.19	1.05
11:34 AM	6.33	36.90	1.14	1.05
11:35 AM	6.19	37.00	1.11	1.05
11:36 AM	6.25	36.98	1.11	1.06
11:37 AM	6.31	36.87	1.13	1.05
11:38 AM	6.24	36.66	1.13	1.04
11:39 AM	5.91	36.67	1.12	1.05
11:40 AM	6.08	36.66	1.10	1.08
11:41 AM	6.15	36.65	1.08	1.05
<b>Average</b>	6.26	36.75	1.15	1.07

Signature   
 Miss Katesarin Vorradetwittaya  
 Environmental Scientist

## STAR PETROLEUM REFINING PUBLIC CO.,LTD. EMISSION TEST RESULT

<b>Date:</b> December 6, 2023 <b>Start time:</b> 11:42 AM <b>O<sub>2</sub> instrument Model:</b> AMI 70 <b>NO<sub>x</sub> instrument Model:</b> Teledyne 200 EM <b>SO<sub>2</sub> instrument Model:</b> API 100 AH <b>CO instrument Model:</b> THERMO 48 C <b>Fuel Type :</b> Natural Gas	<b>Run # :</b> 3 <b>Location :</b> Boiler 3 <b>Finish time :</b> 12:02 PM <b>Serial No.:</b> 161212-14 <b>Serial No.:</b> 435 <b>Serial No.:</b> 058 <b>Serial No.:</b> 412106049 <b>Test Operator :</b> Pisanu S.
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Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
11:42 AM	6.17	36.70	1.13	1.05
11:43 AM	6.17	36.63	1.17	1.05
11:44 AM	6.25	36.50	1.16	1.05
11:45 AM	6.30	36.38	1.11	1.05
11:46 AM	6.33	36.50	1.14	1.05
11:47 AM	6.38	36.65	1.15	1.05
11:48 AM	6.39	36.87	1.16	1.05
11:49 AM	6.57	36.96	1.15	1.06
11:50 AM	6.65	36.99	1.16	1.09
11:51 AM	6.40	37.21	1.15	1.04
11:52 AM	6.45	37.25	1.15	1.04
11:53 AM	6.53	37.11	1.14	1.04
11:54 AM	6.50	37.16	1.14	1.04
11:55 AM	6.49	37.20	1.15	1.04
11:56 AM	6.52	37.02	1.14	1.04
11:57 AM	6.27	36.98	1.16	1.04
11:58 AM	6.39	36.30	1.17	1.04
11:59 AM	6.44	35.90	1.18	1.04
12:00 PM	6.42	36.16	1.16	1.04
12:01 PM	6.32	36.28	1.17	1.04
12:02 PM	6.21	36.31	1.14	1.04
<b>Average</b>	6.39	36.72	1.15	1.05

Signature



Miss Katesarin Vorradetwittaya

Environmental Scientist





บริษัท ซีคอต จำกัด

SECOT CO., LTD.

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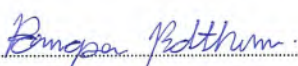
### STACK EMISSION ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REFERENCE NO.	: Refinery-223003-COA-Stk/PM
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING DATE	: 22/12/2023
RECEIVED DATE	: 23/12/2023	ANALYTICAL DATE	: 23-25/12/2023
REPORT DATE	: 28/12/2023	SAMPLE CONDITION	: Normal
STACK LOCATION	: SRU/TGTU Stack	OPERATOR	: Mr. Song Hengchwankun
SOURCE DESCRIPTION	: Combustion	FUEL TYPE	: Natural Gas + Refinery Fuel Gas

#### STACK DESCRIPTION


Height	: 70.1	m	Gas Velocity	: 4.2	m/s
Diameter	: 2.2	m	Flow rate <sup>(1)</sup>	: 338	Ncu.m/min
Temperature	: 458.8	°C	Excess Oxygen	: 6.0	%

PARAMETER	UNIT	RESULTS <sup>(1)</sup>		ASSIGNED VALUE <sup>(2)</sup>	STANDARD <sup>(3)</sup>	REFERENCE METHODS
		6.0 % O <sub>2</sub>	7 % O <sub>2</sub>			
Particulate Matter	mg/Ncu.m	4.1	3.8	60	-	US. EPA Method 5

  
(Miss Pornnapa Budthum)

Analyst

REG.NO. 3-239-ก-0018

  
(Miss Narisa Poowasanpet)

Technical Management Team

REG.NO. 3-239-ก-0010

**Remark :** 1. Reported analysis refers to submitted sample only.

2. This report shall not be reproduced, except in full, without official approval.

3. <sup>(1)</sup> At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. <sup>(2)</sup> Assigned value in EIA Report Expansion 3 of Refinery Plant, B.E. 2561 (2018).

5. <sup>(3)</sup> Notification of the Ministry of Natural Resources and Environment B.E.2554 (2011).



บริษัท ซีคอต จำกัด  
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### STACK EMISSION ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REFERENCE NO.	: Refinery-223003-COA-Stk/H2S
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING DATE	: 22/12/2023
RECEIVED DATE	: 23/12/2023	ANALYTICAL DATE	: 23/12/2023
REPORT DATE	: 02/01/2024	SAMPLE CONDITION	: Normal
STACK LOCATION	: SRU/TGTU Stack	OPERATOR	: Mr. Song Hengchwankun
SOURCE DESCRIPTION	: Combustion	FUEL TYPE	: Natural Gas + Refinery Fuel Gas

#### STACK DESCRIPTION

Height	: 70.1	m	Gas Velocity	: 4.2	m/s
Diameter	: 2.2	m	Flow rate <sup>(1)</sup>	: 338	Ncu.m/min
Temperature	: 458.8	°C	Excess Oxygen	: 6.0	%

PARAMETER	UNIT	RESULTS <sup>(1)</sup>		ASSIGNED VALUE <sup>(2)</sup>	STANDARD	REFERENCE METHODS
		6.0 % O <sub>2</sub>	7 % O <sub>2</sub>			
Hydrogen Sulfide	ppm	<0.3	<0.3	60	-	US. EPA Method 16

*Sudaporn S.*

(Miss Sudaporn Soonthorn)

Analyst

*Narisa Poowasanpetch*

(Miss Narisa Poowasanpetch)

Technical Management Team

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3. <sup>(1)</sup> At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. <sup>(2)</sup> Assigned value in EIA Report Expansion 3 of Refinery Plant, B.E. 2561 (2018).

**The Monitoring Result of Emission Concentration**  
**SRU**  
**STAR PETROLEUM REFINING PUBLIC CO.,LTD.**  
**December 22, 2023**

Run Number	Oxygen content (%)		Oxide of Nitrogen (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	6.14	6.09	10.28	10.26	9.63
2	6.00	5.99	10.48	10.45	9.74
3	5.98	6.01	10.43	10.40	9.71
<b>Average</b>	<b>6.04</b>	<b>6.03</b>	<b>10.40</b>	<b>10.37</b>	<b>9.69</b>

Run Number	Oxygen content (%)		Sulfur dioxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	6.14	6.09	400.39	400.50	375.89
2	6.00	5.99	401.34	401.45	374.26
3	5.98	6.01	403.08	403.19	376.38
<b>Average</b>	<b>6.04</b>	<b>6.03</b>	<b>401.61</b>	<b>401.71</b>	<b>375.51</b>

Run Number	Oxygen content (%)		Carbonmonoxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	6.14	6.09	278.53	279.11	261.96
2	6.00	5.99	277.97	278.42	259.56
3	5.98	6.01	278.69	279.01	260.46
<b>Average</b>	<b>6.04</b>	<b>6.03</b>	<b>278.40</b>	<b>278.85</b>	<b>260.66</b>

# STAR PETROLEUM REFINING PUBLIC CO.,LTD.

## EMISSION TEST RESULT

<b>Date:</b> December 22, 2023 <b>Start time:</b> 10:30 AM <b>O<sub>2</sub> instrument Model:</b> AMI 70 <b>NO<sub>x</sub> instrument Model:</b> API 200 AH <b>SO<sub>2</sub> instrument Model:</b> API 100 AH <b>CO instrument Model:</b> THERMO 48 C <b>Fuel Type :</b> Natural Gas	<b>Run # :</b> 1 <b>Location :</b> SRU <b>Finish time :</b> 10:50 AM <b>Serial No.:</b> 111117-2 <b>Serial No.:</b> 441 <b>Serial No.:</b> 060 <b>Serial No.:</b> 78253-388 <b>Test Operator :</b> Song H.
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Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
10:30 AM	6.25	10.20	398.56	280.23
10:31 AM	6.25	10.16	393.60	281.74
10:32 AM	6.26	10.14	395.82	280.32
10:33 AM	6.21	10.16	400.69	277.81
10:34 AM	6.22	10.20	403.71	276.06
10:35 AM	6.22	10.19	403.22	276.35
10:36 AM	6.21	9.91	401.26	278.66
10:37 AM	6.23	10.01	398.22	275.28
10:38 AM	6.12	10.17	398.20	278.21
10:39 AM	6.08	10.31	398.70	279.31
10:40 AM	6.10	10.39	399.05	279.27
10:41 AM	6.10	10.51	399.11	277.88
10:42 AM	6.09	10.33	399.71	277.20
10:43 AM	6.12	10.34	397.74	276.31
10:44 AM	6.06	10.41	398.07	275.93
10:45 AM	6.11	10.39	396.98	280.87
10:46 AM	6.12	10.31	398.18	279.81
10:47 AM	5.96	10.32	404.84	278.93
10:48 AM	6.14	10.39	407.19	278.72
10:49 AM	6.07	10.49	408.04	279.33
10:50 AM	6.04	10.54	407.37	281.01
<b>Average</b>	6.14	10.28	400.39	278.53

Signature   
 Miss Katesarin Vorradetwittaya  
 Environmental Scientist



# STAR PETROLEUM REFINING PUBLIC CO.,LTD.

## EMISSION TEST RESULT

<b>Date:</b> <u>December 22, 2023</u> <b>Start time:</b> <u>10:51 AM</u> <b>O<sub>2</sub> instrument Model:</b> <u>AMI 70</u> <b>NO<sub>x</sub> instrument Model:</b> <u>API 200 AH</u> <b>SO<sub>2</sub> instrument Model:</b> <u>API 100 AH</u> <b>CO instrument Model:</b> <u>THERMO 48 C</u> <b>Fuel Type :</b> <u>Natural Gas</u>	<b>Run # :</b> <u>2</u> <b>Location :</b> <u>SRU</u> <b>Finish time :</b> <u>11:11 AM</u> <b>Serial No.:</b> <u>111117-2</u> <b>Serial No.:</b> <u>441</u> <b>Serial No.:</b> <u>060</u> <b>Serial No.:</b> <u>78253-388</u> <b>Test Operator :</b> <u>Song H.</u>
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Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
10:51 AM	6.05	10.53	407.01	284.06
10:52 AM	6.08	10.49	405.26	278.78
10:53 AM	6.09	10.49	407.18	280.56
10:54 AM	5.92	10.47	406.57	282.25
10:55 AM	6.02	10.46	406.61	283.05
10:56 AM	5.99	10.49	406.27	283.12
10:57 AM	5.92	10.53	406.82	283.11
10:58 AM	6.00	10.53	402.37	281.82
10:59 AM	5.91	10.40	397.80	281.92
11:00 AM	5.90	10.50	397.16	278.72
11:01 AM	5.94	10.52	398.99	282.07
11:02 AM	5.97	10.44	397.65	277.15
11:03 AM	6.00	10.44	400.22	272.70
11:04 AM	6.12	10.51	401.07	269.49
11:05 AM	6.00	10.49	401.18	268.70
11:06 AM	5.97	10.45	400.76	269.62
11:07 AM	6.00	10.53	398.12	271.73
11:08 AM	5.99	10.58	398.04	274.05
11:09 AM	5.99	10.49	396.57	276.68
11:10 AM	6.00	10.44	396.31	278.48
11:11 AM	6.06	10.35	396.24	279.33
<b>Average</b>	6.00	10.48	401.34	277.97

Signature   
 \_\_\_\_\_  
 Miss Katesarin Vorradetwittaya  
 Environmental Scientist

# STAR PETROLEUM REFINING PUBLIC CO.,LTD.

## EMISSION TEST RESULT

<b>Date:</b> <u>December 22, 2023</u> <b>Start time:</b> <u>11:12 AM</u> <b>O<sub>2</sub> instrument Model:</b> <u>AMI 70</u> <b>NO<sub>x</sub> instrument Model:</b> <u>API 200 AH</u> <b>SO<sub>2</sub> instrument Model:</b> <u>API 100 AH</u> <b>CO instrument Model:</b> <u>THERMO 48 C</u> <b>Fuel Type :</b> <u>Natural Gas</u>	<b>Run # :</b> <u>3</u> <b>Location :</b> <u>SRU</u> <b>Finish time :</b> <u>11:32 AM</u> <b>Serial No.:</b> <u>111117-2</u> <b>Serial No.:</b> <u>441</u> <b>Serial No.:</b> <u>060</u> <b>Serial No.:</b> <u>78253-388</u> <b>Test Operator :</b> <u>Song H.</u>
--	---

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
11:12 AM	6.08	10.48	398.07	280.33
11:13 AM	6.01	10.55	401.80	276.57
11:14 AM	6.05	10.59	401.95	278.01
11:15 AM	6.05	10.58	405.07	279.19
11:16 AM	6.04	10.54	404.56	273.95
11:17 AM	6.02	10.50	402.20	275.39
11:18 AM	5.98	10.52	402.50	276.91
11:19 AM	5.98	10.52	403.79	278.50
11:20 AM	6.08	10.41	401.80	279.61
11:21 AM	5.90	10.44	402.79	279.70
11:22 AM	5.94	10.49	402.01	278.94
11:23 AM	6.02	10.47	402.10	278.93
11:24 AM	6.01	10.38	404.40	277.99
11:25 AM	6.06	10.24	403.59	278.08
11:26 AM	5.91	10.21	404.19	278.60
11:27 AM	5.90	10.35	407.43	279.53
11:28 AM	5.94	10.34	407.88	279.87
11:29 AM	5.95	10.37	406.63	280.81
11:30 AM	5.86	10.28	401.18	281.31
11:31 AM	5.88	10.30	399.56	280.38
11:32 AM	5.85	10.43	401.16	279.87
<b>Average</b>	5.98	10.43	403.08	278.69

Signature   
 Miss Katesarin Vorradetwittaya  
 Environmental Scientist



บริษัท ซีคอต จำกัด

SECOT CO., LTD.

239 ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพฯ 10800

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TEL : +66(0) 2959-3600 FAX : +66(0) 2959-3535 E-mail : envserv@secot.co.th

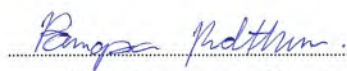
### STACK EMISSION ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REFERENCE NO.	: Refinery-223003-COA-Stk/PM
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING DATE	: 04/12/2023
RECEIVED DATE	: 08/12/2023	ANALYTICAL DATE	: 11-12/12/2023
REPORT DATE	: 14/12/2023	SAMPLE CONDITION	: Normal
STACK LOCATION	: Boiler#2 Stack	OPERATOR	: Mr. Kittipong Thakoengsuk
SOURCE DESCRIPTION	: Combustion	FUEL TYPE	: Natural Gas + Refinery Fuel Gas

#### STACK DESCRIPTION

Height	: 32.4	m	Gas Velocity	: 14.1	m/s
Diameter	: 1.5	m	Flow rate <sup>(1)</sup>	: 881.4	Ncu.m/min
Temperature	: 177.3	°C	Excess Oxygen	: 3.5	%

PARAMETER	UNIT	RESULTS <sup>(1)</sup>		ASSIGNED VALUE <sup>(2)</sup>	STANDARD <sup>(3)</sup>	REFERENCE METHODS
		3.5 % O <sub>2</sub>	7 % O <sub>2</sub>			
Particulate Matter	mg/Ncu.m	2.4	1.9	60	60	US. EPA Method 5

  
(Miss Pornnapa Budthum)

Analyst

REG.NO.จ-239-จ-0018

  
(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO.จ-239-ก-0010

**Remark :** 1. Reported analysis refers to submitted sample only.

2. This report shall not be reproduced, except in full, without official approval.

3. <sup>(1)</sup> At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. <sup>(2)</sup> Assigned value in EIA Report Expansion 3 of Refinery Plant, B.E. 2561 (2018).

5. <sup>(3)</sup> Notification of the Ministry of Natural Resources and Environment B.E.2554 (2011).

**The Monitoring Result of Emission Concentration**  
**Boiler 2**  
**STAR PETROLEUM REFINING PUBLIC CO.,LTD.**  
**December 4, 2023**

Run Number	Oxygen content (%)		Oxide of Nitrogen (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	3.66	3.64	78.59	78.92	63.56
2	3.58	3.56	81.38	81.71	65.50
3	3.44	3.42	81.92	82.24	65.40
<b>Average</b>	<b>3.56</b>	<b>3.54</b>	<b>80.63</b>	<b>80.96</b>	<b>64.82</b>

Run Number	Oxygen content (%)		Sulfur dioxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	3.66	3.64	2.28	2.21	1.78
2	3.58	3.56	2.48	2.41	1.93
3	3.44	3.42	2.58	2.51	2.00
<b>Average</b>	<b>3.56</b>	<b>3.54</b>	<b>2.45</b>	<b>2.38</b>	<b>1.90</b>

Run Number	Oxygen content (%)		Carbonmonoxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	3.66	3.64	0.48	0.44	0.35
2	3.58	3.56	0.48	0.44	0.35
3	3.44	3.42	0.48	0.44	0.35
<b>Average</b>	<b>3.56</b>	<b>3.54</b>	<b>0.48</b>	<b>0.44</b>	<b>0.35</b>




# STAR PETROLEUM REFINING PUBLIC CO.,LTD.

## EMISSION TEST RESULT

<b>Date:</b> <u>December 4, 2023</u> <b>Start time:</b> <u>11:00 AM</u> <b>O<sub>2</sub> instrument Model:</b> <u>AMI 70</u> <b>NO<sub>x</sub> instrument Model:</b> <u>TELEDYNE 200 EM</u> <b>SO<sub>2</sub> instrument Model:</b> <u>API 100 AH</u> <b>CO instrument Model:</b> <u>THERMO 48 C</u> <b>Fuel Type :</b> <u>Natural Gas</u>	<b>Run # :</b> <u>1</u> <b>Location :</b> <u>Boiler 2</u> <b>Finish time :</b> <u>11:20 AM</u> <b>Serial No.:</b> <u>111117-2</u> <b>Serial No.:</b> <u>435</u> <b>Serial No.:</b> <u>058</u> <b>Serial No.:</b> <u>365</u> <b>Test Operator :</b> <u>Kittipong T.</u>
--	---

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
11:00 AM	3.99	76.36	1.90	0.48
11:01 AM	3.79	74.77	2.03	0.48
11:02 AM	3.77	75.42	2.10	0.48
11:03 AM	3.90	75.68	2.12	0.48
11:04 AM	3.84	75.28	2.19	0.48
11:05 AM	3.79	75.81	2.26	0.48
11:06 AM	3.58	76.94	2.28	0.48
11:07 AM	3.52	78.13	2.33	0.48
11:08 AM	3.61	79.16	2.26	0.48
11:09 AM	3.54	79.59	2.34	0.48
11:10 AM	3.57	79.60	2.36	0.48
11:11 AM	3.71	79.39	2.32	0.48
11:12 AM	3.70	78.64	2.36	0.48
11:13 AM	3.65	79.00	2.41	0.48
11:14 AM	3.58	79.87	2.39	0.48
11:15 AM	3.63	79.55	2.35	0.48
11:16 AM	3.60	80.12	2.31	0.48
11:17 AM	3.51	81.74	2.37	0.48
11:18 AM	3.49	81.80	2.38	0.48
11:19 AM	3.51	81.81	2.41	0.48
11:20 AM	3.59	81.83	2.44	0.48
<b>Average</b>	3.66	78.59	2.28	0.48

Signature   
 Miss Katesarin Vorradetwittaya  
 Environmental Scientist

# STAR PETROLEUM REFINING PUBLIC CO.,LTD.

## EMISSION TEST RESULT

<b>Date:</b> <u>December 4, 2023</u> <b>Start time:</b> <u>11:21 AM</u> <b>O<sub>2</sub> instrument Model:</b> <u>AMI 70</u> <b>NO<sub>x</sub> instrument Model:</b> <u>TELEDYNE 200 EM</u> <b>SO<sub>2</sub> instrument Model:</b> <u>API 100 AH</u> <b>CO instrument Model:</b> <u>THERMO 48 C</u> <b>Fuel Type :</b> <u>Natural Gas</u>	<b>Run # :</b> <u>2</u> <b>Location :</b> <u>Boiler 2</u> <b>Finish time :</b> <u>11:41 AM</u> <b>Serial No.:</b> <u>111117-2</u> <b>Serial No.:</b> <u>435</u> <b>Serial No.:</b> <u>058</u> <b>Serial No.:</b> <u>365</u> <b>Test Operator :</b> <u>Kittipong T.</u>
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Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
11:21 AM	3.66	81.61	2.42	0.48
11:22 AM	3.63	81.40	2.41	0.48
11:23 AM	3.70	81.92	2.40	0.48
11:24 AM	3.67	81.81	2.50	0.48
11:25 AM	3.48	81.15	2.43	0.48
11:26 AM	3.28	80.38	2.46	0.48
11:27 AM	3.49	80.86	2.46	0.48
11:28 AM	3.64	81.62	2.41	0.48
11:29 AM	3.74	80.89	2.41	0.48
11:30 AM	3.77	79.88	2.44	0.48
11:31 AM	3.93	79.56	2.45	0.48
11:32 AM	3.86	79.36	2.51	0.48
11:33 AM	3.74	80.15	2.54	0.48
11:34 AM	3.66	81.42	2.47	0.48
11:35 AM	3.51	82.38	2.55	0.48
11:36 AM	3.49	82.98	2.53	0.48
11:37 AM	3.62	83.34	2.55	0.48
11:38 AM	3.66	82.38	2.52	0.48
11:39 AM	3.45	81.57	2.55	0.48
11:40 AM	3.05	81.42	2.60	0.48
11:41 AM	3.05	82.81	2.54	0.48
<b>Average</b>	3.58	81.38	2.48	0.48

Signature



Miss Katesarin Vorradetwittaya

Environmental Scientist

# STAR PETROLEUM REFINING PUBLIC CO.,LTD.

## EMISSION TEST RESULT

<b>Date:</b> December 4, 2023 <b>Start time:</b> 11:42 AM <b>O<sub>2</sub> instrument Model:</b> AMI 70 <b>NO<sub>x</sub> instrument Model:</b> TELEDYNE 200 EM <b>SO<sub>2</sub> instrument Model:</b> API 100 AH <b>CO instrument Model:</b> THERMO 48 C <b>Fuel Type :</b> Natural Gas	<b>Run # :</b> 3 <b>Location :</b> Boiler 2 <b>Finish time :</b> 12:02 PM <b>Serial No.:</b> 111117-2 <b>Serial No.:</b> 435 <b>Serial No.:</b> 058 <b>Serial No.:</b> 365 <b>Test Operator :</b> Kittipong T.
---	---

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
11:42 AM	3.24	83.21	2.51	0.48
11:43 AM	3.51	82.89	2.61	0.48
11:44 AM	3.54	81.89	2.57	0.48
11:45 AM	3.53	81.11	2.51	0.48
11:46 AM	3.55	81.61	2.52	0.48
11:47 AM	3.32	82.04	2.59	0.48
11:48 AM	3.54	83.19	2.57	0.48
11:49 AM	3.72	81.73	2.59	0.48
11:50 AM	3.85	80.83	2.56	0.48
11:51 AM	3.70	80.48	2.56	0.48
11:52 AM	3.66	80.96	2.56	0.48
11:53 AM	3.61	81.04	2.53	0.48
11:54 AM	3.48	80.65	2.59	0.48
11:55 AM	3.47	81.09	2.60	0.48
11:56 AM	3.44	81.48	2.56	0.48
11:57 AM	3.30	81.74	2.61	0.48
11:58 AM	3.07	82.33	2.63	0.48
11:59 AM	3.16	83.14	2.63	0.48
12:00 PM	3.10	83.07	2.69	0.48
12:01 PM	3.14	82.91	2.63	0.48
12:02 PM	3.30	82.84	2.61	0.48
<b>Average</b>	3.44	81.92	2.58	0.48

Signature



Miss Katesarin Vorradetwittaya

Environmental Scientist





บริษัท ซีคอต จำกัด

SECOT CO., LTD.

239 ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพฯ 10800

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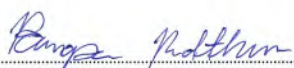
### STACK EMISSION ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REFERENCE NO.	: Refinery-223003-COA-Stk/PM
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING DATE	: 08/12/2023
RECEIVED DATE	: 11/12/2023	ANALYTICAL DATE	: 11-12/12/2023
REPORT DATE	: 14/12/2023	SAMPLE CONDITION	: Normal
STACK LOCATION	: HRSG#2 Stack	OPERATOR	: Mr. Song Hengchwankun
SOURCE DESCRIPTION	: Combustion	FUEL TYPE	: Natural Gas + Refinery Fuel Gas

#### STACK DESCRIPTION

Height	: 21.7	m	Gas Velocity	: 17.0	m/s
Diameter	: 3.0	m	Flow rate <sup>(1)</sup>	: 3,897	Ncu.m/min
Temperature	: 212.3	°C	Excess Oxygen	: 14.8	%

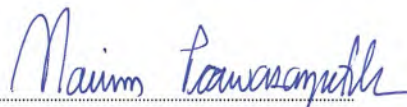
PARAMETER	UNIT	RESULTS <sup>(1)</sup>		ASSIGNED VALUE <sup>(2)</sup>	STANDARD <sup>(3)</sup>	REFERENCE METHODS
		14.8 % O <sub>2</sub>	7 % O <sub>2</sub>			
Particulate Matter	mg/Ncu.m	2.1	4.8	60	60	US. EPA Method 5



(Miss Pornnapa Budthum)

Analyst

REG.NO.จ-239-ท-0018



(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO.จ-239-ท-0010

**Remark :** 1. Reported analysis refers to submitted sample only.

2. This report shall not be reproduced, except in full, without official approval.

3. <sup>(1)</sup> At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. <sup>(2)</sup> Assigned value in EIA Report Expansion 3 of Refinery Plant, B.E. 2561 (2018).

5. <sup>(3)</sup> Notification of the Ministry of Natural Resources and Environment B.E.2554 (2011).



**The Monitoring Result of Emission Concentration**  
**HRSG 2**  
**STAR PETROLEUM REFINING PUBLIC CO.,LTD.**  
**December 8, 2023**

Run Number	Oxygen content (%)		Oxide of Nitrogen (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	14.70	14.79	41.11	41.16	93.64
2	14.76	14.85	41.68	41.73	95.88
3	14.78	14.87	41.65	41.70	96.12
<b>Average</b>	<b>14.74</b>	<b>14.84</b>	<b>41.48</b>	<b>41.53</b>	<b>95.21</b>

Run Number	Oxygen content (%)		Sulfur dioxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	14.70	14.79	0.22	0.19	0.43
2	14.76	14.85	0.26	0.22	0.51
3	14.78	14.87	0.30	0.26	0.60
<b>Average</b>	<b>14.74</b>	<b>14.84</b>	<b>0.26</b>	<b>0.22</b>	<b>0.51</b>

Run Number	Oxygen content (%)		Carbonmonoxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	14.70	14.79	1.06	1.04	2.37
2	14.76	14.85	0.87	0.85	1.95
3	14.78	14.87	0.75	0.72	1.66
<b>Average</b>	<b>14.74</b>	<b>14.84</b>	<b>0.89</b>	<b>0.87</b>	<b>1.99</b>

# STAR PETROLEUM REFINING PUBLIC CO.,LTD.

## EMISSION TEST RESULT

<b>Date:</b> <u>December 8, 2023</u> <b>Start time:</b> <u>10:20 AM</u> <b>O<sub>2</sub> instrument Model:</b> <u>AMI 70</u> <b>NO<sub>x</sub> instrument Model:</b> <u>API 200 AH</u> <b>SO<sub>2</sub> instrument Model:</b> <u>API 100 AH</u> <b>CO instrument Model:</b> <u>THERMO 48 C</u> <b>Fuel Type :</b> <u>Natural Gas</u>	<b>Run # :</b> <u>1</u> <b>Location :</b> <u>HRSG 2</u> <b>Finish time :</b> <u>10:40 AM</u> <b>Serial No.:</b> <u>111117-2</u> <b>Serial No.:</b> <u>441</u> <b>Serial No.:</b> <u>060</u> <b>Serial No.:</b> <u>388</u> <b>Test Operator :</b> <u>Kittipong T.</u>
---	---

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
10:20 AM	14.66	40.72	0.19	1.15
10:21 AM	14.65	40.73	0.19	1.15
10:22 AM	14.66	40.68	0.20	1.15
10:23 AM	14.68	40.91	0.22	1.15
10:24 AM	14.67	40.99	0.20	1.15
10:25 AM	14.67	41.03	0.22	1.15
10:26 AM	14.68	41.12	0.17	1.15
10:27 AM	14.70	41.09	0.22	1.15
10:28 AM	14.68	40.89	0.20	1.15
10:29 AM	14.67	40.82	0.20	1.15
10:30 AM	14.68	41.01	0.20	1.15
10:31 AM	14.70	40.97	0.22	1.13
10:32 AM	14.70	41.16	0.24	0.95
10:33 AM	14.72	41.32	0.23	0.95
10:34 AM	14.72	41.29	0.20	0.95
10:35 AM	14.73	41.42	0.20	0.95
10:36 AM	14.73	41.27	0.25	0.95
10:37 AM	14.73	41.35	0.22	0.95
10:38 AM	14.73	41.43	0.27	0.95
10:39 AM	14.73	41.63	0.23	0.95
10:40 AM	14.74	41.52	0.27	0.95
<b>Average</b>	14.70	41.11	0.22	1.06

Signature



Miss Katesarin Vorradetwittaya

Environmental Scientist

# STAR PETROLEUM REFINING PUBLIC CO.,LTD.

## EMISSION TEST RESULT

<b>Date:</b> <u>December 8, 2023</u> <b>Start time:</b> <u>10:41 AM</u> <b>O<sub>2</sub> instrument Model:</b> <u>AMI 70</u> <b>NO<sub>x</sub> instrument Model:</b> <u>API 200 AH</u> <b>SO<sub>2</sub> instrument Model:</b> <u>API 100 AH</u> <b>CO instrument Model:</b> <u>THERMO 48 C</u> <b>Fuel Type :</b> <u>Natural Gas</u>	<b>Run # :</b> <u>2</u> <b>Location :</b> <u>HRSG 2</u> <b>Finish time :</b> <u>11:01 AM</u> <b>Serial No.:</b> <u>111117-2</u> <b>Serial No.:</b> <u>441</u> <b>Serial No.:</b> <u>060</u> <b>Serial No.:</b> <u>388</u> <b>Test Operator :</b> <u>Kittipong T.</u>
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Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
10:41 AM	14.74	41.58	0.26	0.95
10:42 AM	14.72	41.56	0.26	0.95
10:43 AM	14.72	41.46	0.26	0.95
10:44 AM	14.74	41.49	0.27	0.95
10:45 AM	14.74	41.44	0.22	0.95
10:46 AM	14.74	41.46	0.26	0.95
10:47 AM	14.74	41.48	0.26	0.95
10:48 AM	14.74	41.69	0.26	0.95
10:49 AM	14.73	41.87	0.27	0.95
10:50 AM	14.74	42.10	0.26	0.95
10:51 AM	14.78	41.97	0.27	0.95
10:52 AM	14.75	41.60	0.26	0.95
10:53 AM	14.75	41.80	0.26	0.80
10:54 AM	14.79	41.92	0.26	0.75
10:55 AM	14.78	41.94	0.28	0.75
10:56 AM	14.77	41.88	0.27	0.75
10:57 AM	14.79	41.79	0.24	0.75
10:58 AM	14.80	41.58	0.26	0.75
10:59 AM	14.79	41.36	0.27	0.75
11:00 AM	14.77	41.66	0.28	0.75
11:01 AM	14.80	41.75	0.28	0.75
<b>Average</b>	14.76	41.68	0.26	0.87

Signature



Miss Katesarin Vorradetwittaya

Environmental Scientist

# STAR PETROLEUM REFINING PUBLIC CO.,LTD.

## EMISSION TEST RESULT

<b>Date:</b> <u>December 8, 2023</u> <b>Start time:</b> <u>11:02 AM</u> <b>O<sub>2</sub> instrument Model:</b> <u>AMI 70</u> <b>NO<sub>x</sub> instrument Model:</b> <u>API 200 AH</u> <b>SO<sub>2</sub> instrument Model:</b> <u>API 100 AH</u> <b>CO instrument Model:</b> <u>THERMO 48 C</u> <b>Fuel Type :</b> <u>Natural Gas</u>	<b>Run # :</b> <u>3</u> <b>Location :</b> <u>HRSG 2</u> <b>Finish time :</b> <u>11:22 AM</u> <b>Serial No.:</b> <u>111117-2</u> <b>Serial No.:</b> <u>441</u> <b>Serial No.:</b> <u>060</u> <b>Serial No.:</b> <u>388</u> <b>Test Operator :</b> <u>Kittipong T.</u>
---	---

Time, min	O <sub>2</sub> (%)	NO <sub>x</sub> (ppm)	SO <sub>2</sub> (ppm)	CO (ppm)
11:02 AM	14.79	41.55	0.27	0.75
11:03 AM	14.77	41.40	0.30	0.75
11:04 AM	14.79	41.45	0.32	0.75
11:05 AM	14.78	41.54	0.29	0.75
11:06 AM	14.75	41.55	0.27	0.75
11:07 AM	14.79	41.84	0.29	0.75
11:08 AM	14.77	41.98	0.27	0.75
11:09 AM	14.75	41.83	0.30	0.75
11:10 AM	14.77	41.97	0.32	0.75
11:11 AM	14.80	41.86	0.27	0.75
11:12 AM	14.79	41.59	0.26	0.75
11:13 AM	14.75	41.69	0.28	0.75
11:14 AM	14.77	41.77	0.28	0.75
11:15 AM	14.78	41.72	0.31	0.75
11:16 AM	14.80	41.71	0.30	0.75
11:17 AM	14.77	41.75	0.32	0.75
11:18 AM	14.75	41.74	0.31	0.75
11:19 AM	14.79	41.81	0.32	0.75
11:20 AM	14.79	41.01	0.32	0.75
11:21 AM	14.82	41.34	0.32	0.75
11:22 AM	14.81	41.46	0.31	0.75
<b>Average</b>	14.78	41.65	0.30	0.75

Signature



Miss Katesarin Vorradetwittaya

Environmental Scientist





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## STACK EMISSION ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REF. NO.	: Refinery-223003-COA-Stk/Bz
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING DATE	: 11/12/2023
RECEIVED DATE	: 12/12/2023	ANALYTICAL DATE	: 15-16/12/2023
REPORT DATE	: 19/12/2023	SAMPLE CONDITION	: Normal
STACK LOCATION	: VRU Stack	OPERATOR	: Mr. Song Hengchwankun
SOURCE DESCRIPTION	: Process	FUEL TYPE	: -

### STACK DESCRIPTION

Height	: 10.0	m.	Velocity <sup>(1)</sup>	: 3.5	m/s
Diameter	: 0.25	m.	Flow Rate <sup>(1)</sup>	: 9.7	Nm <sup>3</sup> /min
Temperature <sup>(1)</sup>	: 42.0	°C	Excess Oxygen <sup>(1)</sup>	: 20.8	%

PARAMETER	UNIT	RESULTS		ASSIGN VALUE <sup>(2)</sup>	STANDARD	REFERENCE METHODS
		INLET	OUTLET			
Benzene	ppm	25.66	0.70	-	-	US. EPA Method 18
	mg/l	0.08	0.002	0.21	-	
	g/s	-	0.0004	0.017	-	

*Sudaporn S.*

(Miss Sudaporn Soonthorn)

Analyst

*Narisa Poowasanpeth*

(Miss Narisa Poowasanpeth)

Technical Management Team

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  3. <sup>(1)</sup> The data from VRU Outlet.
  4. <sup>(2)</sup> Assigned value in EIA Report Expasion 3 of Refinery Plant, B.E. 2561 (2018).



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### STACK EMISSION ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REF. NO.	: Refinery-223003-COA-Stk/TVOC
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING DATE	: 11/12/2023
RECEIVED DATE	: 12/12/2023	ANALYTICAL DATE	: 13/12/2023
REPORT DATE	: 19/12/2023	SAMPLE CONDITION	: Normal
STACK LOCATION	: VRU Stack	OPERATOR	: Mr. Song Hengchwankun
SOURCE DESCRIPTION	: Process	FUEL TYPE	: -

#### STACK DESCRIPTION

Height	: 10.0	m.	Velocity <sup>(1)</sup>	: 3.5	m/s
Diameter	: 0.25	m.	Flow Rate <sup>(1)</sup>	: 9.7	Nm <sup>3</sup> /min
Temperature <sup>(1)</sup>	: 42.0	°C	Excess Oxygen <sup>(1)</sup>	: 20.8	%

PARAMETER	UNIT	RESULTS		ASSIGN VALUE <sup>(2)</sup>	STANDARD <sup>(3)</sup>	REFERENCE METHODS
		INLET	OUTLET			
TVOCs	ppm	4,216	340	-	-	US. EPA Method 25A
	mg/l	7.56	0.61	15	17	
	g/s	-	0.099	1.212	-	

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

Narisa Poowasanpet

(Miss Narisa Poowasanpet)

Technical Management Team

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3. <sup>(1)</sup> The data from VRU Outlet.

4. <sup>(2)</sup> Assigned value in EIA Report Expansion 3 of Refinery Plant, B.E. 2561 (2018).

5. <sup>(3)</sup> Notification of the Ministry of Natural Resources and Environment B.E.2553 (2010).



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### STACK EMISSION ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REF. NO.	: Refinery-223003-COA-Stk/H2S
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING DATE	: 07/12/2023
RECEIVED DATE	: 08/12/2023	ANALYTICAL DATE	: 16/12/2023
REPORT DATE	: 30/05/2023	SAMPLE CONDITION	: Normal
STACK LOCATION	: Wash Tower Stack at CCRU Unit	OPERATOR	: Mr. Song Hengchwankun
SOURCE DESCRIPTION	: Process	FUEL TYPE	: -

PARAMETER	UNIT	RESULTS	ASSIGNED VALUE	STANDARD	REFERENCE METHODS
Hydrogen Sulfide	ppm	<0.30	-	-	US. EPA Method 16

Sudaporn S.  
(Miss Sudaporn Soonthorn)  
Analyst

Narisa Poowasanpeth.  
(Miss Narisa Poowasanpeth)  
Technical Management Team

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### STACK EMISSION ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REF. NO.	: Refinery-223003-COA-Stk/HCl
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING DATE	: 07/12/2023
RECEIVED DATE	: 08/12/2023	ANALYTICAL DATE	: 11/12/2023
REPORT DATE	: 19/12/2023	SAMPLE CONDITION	: Normal
STACK LOCATION	: Wash Tower Stack at CCRU Unit	OPERATOR	: Mr. Song Hengchwankun
SOURCE DESCRIPTION	: Process	FUEL TYPE	: -

PARAMETER	UNIT	RESULTS	ASSIGNED VALUE	STANDARD	REFERENCE METHODS
Hydrogen Chloride	ppm	0.03	-	-	US. EPA Method 26

Janista Kui-on

(Miss Janista Kui-on)

Analyst

REG.NO.จ-239-จ-0023

Narisa Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO.จ-239-ค-0010

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 1127/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 06/07/2023	SAMPLING TIME	: 09:50
RECEIVED DATE	: 07/07/2023	ANALYTICAL DATE	: 07-15/07/2023
REPORT DATE	: 15/07/2023	SITE OPERATOR	: Mr. Watcharakan Pramakhate
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_WW_July

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION	STANDARD <sup>1/</sup>
				Near the refinery outfall	
Temperature	°C	2550 B	< 0.5	32.4	≤ 40
pH	-	4500-H <sup>+</sup> B	< 0.10	7.80	5.5-9.0
Total Dissolved Solids	mg/l	2540 C	< 50	1,152	≤ 3,000
Total Suspended Solids	mg/l	2540 D	< 5	< 5	≤ 50
Ammonia Nitrogen	mg/l	Method 350.2	< 0.02	0.15	-
Sulfide	mg/l	4500-S <sup>2-</sup> F	< 0.20	ND	≤ 1
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	≤ 5
Phenols	mg/l	5530 B,C	< 0.001	ND	≤ 1
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	1.6	≤ 20
COD	mg/l	5220 D	< 40.00	< 40.00	≤ 120
Chromium Hexavalent (Cr <sup>6+</sup> )	mg/l	3500-Cr B	< 0.01	ND	≤ 0.25
Chromium Trivalent (Cr <sup>3+</sup> )	mg/l	3113 B/Calculation	< 0.001	ND	≤ 0.75
Mercury (Hg)	mg/l	3112 B	< 0.0005	ND	≤ 0.005

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED., 2017 (AWWA, APHA, WEF)

*Khemchuda Insorn*

(Miss Khemchuda Insorn)

Analyst

REG. NO. ว-239-ค-5976

*Araya Tippiaruk*

( Mrs. Araya Tippiaruk )

Technical Management Team

REG. NO. ว-239-ค-5863

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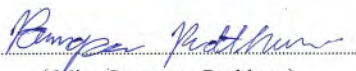
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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 1307/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 07/08/2023	SAMPLING TIME	: 10:17
RECEIVED DATE	: 08/08/2023	ANALYTICAL DATE	: 08-15/08/2023
REPORT DATE	: 16/08/2023	SITE OPERATOR	: Mr. Aniwat Pimwanna
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_WW_August


PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION	STANDARD <sup>1/</sup>
				Near the refinery outfall	
Temperature	°C	2550 B	< 0.5	31.8	≤ 40
pH	-	4500-H <sup>+</sup> B	< 0.10	7.91	5.5-9.0
Total Dissolved Solids	mg/l	2540 C	< 50	808	≤ 3,000
Total Suspended Solids	mg/l	2540 D	< 5	8	≤ 50
Ammonia Nitrogen	mg/l	Method 350.2	< 0.02	0.20	-
Sulfide	mg/l	4500-S <sup>2-</sup> F	< 0.20	ND	≤ 1
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	≤ 5
Phenols	mg/l	5530 B,C	< 0.001	ND	≤ 1
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	< 1.0	≤ 20
COD	mg/l	5220 D	< 40.00	< 40.00	≤ 120
Chromium Hexavalent (Cr <sup>6+</sup> )	mg/l	3500-Cr B	< 0.01	ND	≤ 0.25
Chromium Trivalent (Cr <sup>3+</sup> )	mg/l	3113 B/Calculation	< 0.001	ND	≤ 0.75
Mercury (Hg)	mg/l	3112 B	< 0.0005	ND	≤ 0.005

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED., 2017 (AWWA, APHA, WEF)

  
( Miss Pornnapa Budthum )

Analyst

REG.NO. ๖-239-๖-0018

  
( Mrs. Araya Tipparuk )

Technical Management Team

REG. NO. ๖-239-๖-0004

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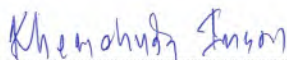
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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 1601,1607/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 14/09/2023	SAMPLING TIME	: 10:10
RECEIVED DATE	: 15/09/2023	ANALYTICAL DATE	: 15-22/09/2023
REPORT DATE	: 22/09/2023	SITE OPERATOR	: Miss Thipsuda Wannakran
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_WW_September

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION	STANDARD <sup>1/</sup>
				Near the refinery outfall	
Temperature	°C	2550 B	< 0.5	31.9	≤ 40
pH	-	4500-H <sup>+</sup> B	< 0.10	8.42	5.5-9.0
Total Dissolved Solids	mg/l	2540 C	< 50	1,080	≤ 3,000
Total Suspended Solids	mg/l	2540 D	< 5	12	≤ 50
Ammonia Nitrogen	mg/l	Method 350.2	< 0.02	0.11	-
Sulfide	mg/l	4500-S <sup>2-</sup> F	< 0.20	ND	≤ 1
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	≤ 5
Phenols	mg/l	5530 B,C	< 0.001	ND	≤ 1
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	< 1.0	≤ 20
COD	mg/l	5220 D	< 40.00	41.21	≤ 120
Chromium Hexavalent (Cr <sup>6+</sup> )	mg/l	3500-Cr B	< 0.01	ND	≤ 0.25
Chromium Trivalent (Cr <sup>3+</sup> )	mg/l	3113 B/Calculation	< 0.001	ND	≤ 0.75
Mercury (Hg)	mg/l	3112 B	< 0.0005	ND	≤ 0.005

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED.,2017 (AWWA,APHA, WEF)



(Miss Khemchuda Insorn)

Analyst

REG. NO. ๖-239-ก-0005



( Mrs. Araya Tipparuk )

Technical Management Team

REG. NO. ๖-239-ก-0004

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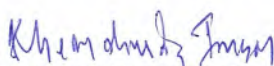
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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 1789/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 12/10/2023	SAMPLING TIME	: 08:57
RECEIVED DATE	: 13/10/2023	ANALYTICAL DATE	: 13-20/10/2023
REPORT DATE	: 21/10/2023	SITE OPERATOR	: Mr. Watcharakan Pramakhate
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_WW_October

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION	STANDARD <sup>1/</sup>
				Near the refinery outfall	
Temperature	°C	2550 B	< 0.5	29.3	≤ 40
pH	-	4500-H <sup>+</sup> B	< 0.10	7.38	5.5-9.0
Total Dissolved Solids	mg/l	2540 C	< 50	163	≤ 3,000
Total Suspended Solids	mg/l	2540 D	< 5	5	≤ 50
Ammonia Nitrogen	mg/l	Method 350.2	< 0.02	0.19	-
Sulfide	mg/l	4500-S <sup>2-</sup> F	< 0.20	ND	≤ 1
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	≤ 5
Phenols	mg/l	5530 B,C	< 0.001	ND	≤ 1
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	< 1.0	≤ 20
COD	mg/l	5220 D	< 40.00	< 40.00	≤ 120
Chromium Hexavalent (Cr <sup>6+</sup> )	mg/l	3500-Cr B	< 0.01	ND	≤ 0.25
Chromium Trivalent (Cr <sup>3+</sup> )	mg/l	3113 B/Calculation	< 0.001	ND	≤ 0.75
Mercury (Hg)	mg/l	3112 B	< 0.0005	ND	≤ 0.005

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED., 2017 (AWWA, APHA, WEF)



(Miss Khemchuda Insorn)

Analyst

REG. NO. จ-239-ท-0005



( Mrs. Araya Tipparuk )

Technical Management Team

REG. NO. จ-239-ท-0004

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 2018/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 16/11/2023	SAMPLING TIME	: 08.12,09.54-10.03
RECEIVED DATE	: 17/11/2023	ANALYTICAL DATE	: 17-22/11/2023
REPORT DATE	: 23/11/2023	SITE OPERATOR	: Miss Mareeyanee Hawae
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_WW_November

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION	STANDARD <sup>1/</sup>
				Near the refinery outfall	
Temperature	°C	2550 B	< 0.5	28.5	≤ 40
pH	-	4500-H <sup>+</sup> B	< 0.10	8.04	5.5-9.0
Total Dissolved Solids	mg/l	2540 C	< 50	740	≤ 3,000
Total Suspended Solids	mg/l	2540 D	< 5	5	≤ 50
Ammonia Nitrogen	mg/l	Method 350.2	< 0.02	ND	-
Sulfide	mg/l	4500-S <sup>2-</sup> F	< 0.20	ND	≤ 1
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	≤ 5
Phenols	mg/l	5530 B,C	< 0.001	ND	≤ 1
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	< 1.0	≤ 20
COD	mg/l	5220 D	< 40.00	< 40.00	≤ 120
Chromium Hexavalent (Cr <sup>6+</sup> )	mg/l	3500-Cr B	< 0.01	ND	≤ 0.25
Chromium Trivalent (Cr <sup>3+</sup> )	mg/l	3113 B/Calculation	< 0.001	0.003	≤ 0.75
Mercury (Hg)	mg/l	3112 B	< 0.0005	0.0006	≤ 0.005

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED.,2017 (AWWA,APHA, WEF)

*Khemchuda Insorn*

(Miss Khemchuda Insorn)

Analyst

REG. NO. ว-239-ก-0005

*Araya Tipparuk*

( Mrs. Araya Tipparuk )

Technical Management Team

REG. NO. ว-239-ก-0004

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  3. <sup>1/</sup> Notification of the Ministry of Industry, B.E.2560 (2017).
  4. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 2217/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 15/12/2023	SAMPLING TIME	: 09:18
RECEIVED DATE	: 16/12/2023	ANALYTICAL DATE	: 16-21/12/2023
REPORT DATE	: 22/12/2023	SITE OPERATOR	: Mr. Watcharakan Pramakhate
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_WW_December

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION	STANDARD <sup>1/</sup>
				Near the refinery outfall	
Temperature	°C	2550 B	< 0.5	30.5	≤ 40
pH	-	4500-H <sup>+</sup> B	< 0.10	7.25	5.5-9.0
Total Dissolved Solids	mg/l	2540 C	< 50	1,204	≤ 3,000
Total Suspended Solids	mg/l	2540 D	< 5	< 5	≤ 50
Ammonia Nitrogen	mg/l	Method 350.2	< 0.02	0.17	-
Sulfide	mg/l	4500-S <sup>2-</sup> F	< 0.20	ND	≤ 1
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	≤ 5
Phenols	mg/l	5530 B,C	< 0.001	ND	≤ 1
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	< 1.0	≤ 20
COD	mg/l	5220 D	< 40.00	< 40.00	≤ 120
Chromium Hexavalent (Cr <sup>6+</sup> )	mg/l	3500-Cr B	< 0.01	ND	≤ 0.25
Chromium Trivalent (Cr <sup>3+</sup> )	mg/l	3113 B/Calculation	< 0.001	0.003	≤ 0.75
Mercury (Hg)	mg/l	3112 B	< 0.0005	ND	≤ 0.005

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED.,2017 (AWWA,APHA, WEF)

*Khemchuda Insorn*

(Miss Khemchuda Insorn)

Analyst

REG. NO. ๖-239-ก-0005

*Araya Tipparuk*

( Mrs. Araya Tipparuk )

Technical Management Team

REG. NO. ๖-239-ก-0004

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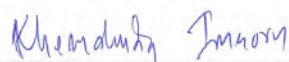
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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 1128/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 06/07/2023	SAMPLING TIME	: 10:20-11:00
RECEIVED DATE	: 07/07/2023	ANALYTICAL DATE	: 07-15/07/2023
REPORT DATE	: 15/07/2023	SITE OPERATOR	: Mr. Watcharakan Pramakhate
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_SW_July
SAMPLE DESCRIPTION	: 1 = Within IEAT drainage channel upstream from refinery outfall 2 = Within IEAT drainage channel downstream from refinery outfall		

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD <sup>1/</sup>
				1	2	
Temperature	°C	2550 B	< 0.5	35.0	33.0	-
pH	-	4500-H <sup>+</sup> B	< 0.10	8.35	8.25	-
Total Dissolved Solids	mg/l	2540 C	< 50	5,488	4,292	-
Suspended Solids	mg/l	2540 D	< 5	14	14	-
Ammonia Nitrogen	mg/l	4500-NH <sub>3</sub> B,C	< 0.02	2.1	2.3	-
Sulfide as H <sub>2</sub> S	mg/l	4500-S <sup>2-</sup> F	< 0.20	ND	ND	-
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	ND	-
Phenols	mg/l	5530 B,C	< 0.001	ND	ND	-
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	2.9	3.0	-
COD	mg/l	5220 D	< 40.00	43.58	< 40.00	-
Chromium Hexavalent (Cr <sup>6+</sup> )	mg/l	3500-Cr B	< 0.01	ND	ND	-
Chromium Trivalent (Cr <sup>3+</sup> )	mg/l	3113 B/Calculation	< 0.001	ND	ND	-
Mercury (Hg)	mg/l	3112 B	< 0.0005	ND	ND	-

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED., 2017 (AWWA, APHA, WEF)



(Miss Khemchuda Insorn)

Analyst



(Mrs. Araya Tippasuk)

Technical Management Team

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  5. - Not available.





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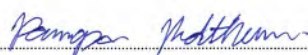
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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 1308/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 07/08/2023	SAMPLING TIME	: 13:38-14:22
RECEIVED DATE	: 08/08/2023	ANALYTICAL DATE	: 08-15/08/2023
REPORT DATE	: 16/08/2023	SITE OPERATOR	: Mr. Aniwat Pimwanna
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_SW_August
SAMPLE DESCRIPTION	: 1 = Within IEAT drainage channel upstream from refinery outfall 2 = Within IEAT drainage channel downstream from refinery outfall		

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD <sup>1/</sup>
				1	2	
Temperature	°C	2550 B	< 0.5	34.2	34.9	-
pH	-	4500-H <sup>+</sup> B	< 0.10	8.79	8.87	-
Total Dissolved Solids	mg/l	2540 C	< 50	5,480	6,096	-
Suspended Solids	mg/l	2540 D	< 5	48	28	-
Ammonia Nitrogen	mg/l	4500-NH <sub>3</sub> B,C	< 0.02	1.6	1.1	-
Sulfide as H <sub>2</sub> S	mg/l	4500-S <sup>2-</sup> F	< 0.20	ND	ND	-
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	ND	-
Phenols	mg/l	5530 B,C	< 0.001	ND	ND	-
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	5.2	3.4	-
COD	mg/l	5220 D	< 40.00	< 40.00	< 40.00	-
Chromium Hexavalent (Cr <sup>6+</sup> )	mg/l	3500-Cr B	< 0.01	ND	ND	-
Chromium Trivalent (Cr <sup>3+</sup> )	mg/l	3113 B/Calculation	< 0.001	ND	ND	-
Mercury (Hg)	mg/l	3112 B	< 0.0005	ND	ND	-

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED., 2017 (AWWA, APHA, WEF)



( Miss Pornnapa Budthum )

Analyst



( Mrs. Araya Tipparuk )

Technical Management Team

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 1602/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 14/09/2023	SAMPLING TIME	: 10:20-10:40
RECEIVED DATE	: 15/09/2023	ANALYTICAL DATE	: 15-22/09/2023
REPORT DATE	: 22/09/2023	SITE OPERATOR	: Miss Thipsuda Wannakran
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_SW_Sepemter
SAMPLE DESCRIPTION	: 1 = Within IEAT drainage channel upstream from refinery outfall 2 = Within IEAT drainage channel downstream from refinery outfall		

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD <sup>1/</sup>
				1	2	
Temperature	°C	2550 B	< 0.5	34.0	31.4	-
pH	-	4500-H <sup>+</sup> B	< 0.10	8.14	8.68	-
Total Dissolved Solids	mg/l	2540 C	< 50	4,276	4,728	-
Suspended Solids	mg/l	2540 D	< 5	17	16	-
Ammonia Nitrogen	mg/l	4500-NH <sub>3</sub> B,C	< 0.02	2.4	2.5	-
Sulfide as H <sub>2</sub> S	mg/l	4500-S <sup>2-</sup> F	< 0.20	ND	ND	-
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	ND	-
Phenols	mg/l	5530 B,C	< 0.001	ND	ND	-
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	3.3/3.1	3.5/2.7	-
COD	mg/l	5220 D	< 40.00	54.40	< 40.00	-
Chromium Hexavalent (Cr <sup>6+</sup> )	mg/l	3500-Cr B	< 0.01	ND	ND	-
Chromium Trivalent (Cr <sup>3+</sup> )	mg/l	3113 B/Calculation	< 0.001	0.026	0.023	-
Mercury (Hg)	mg/l	3112 B	< 0.0005	ND	0.0006	-

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED., 2017 (AWWA, APHA, WEF)

*Khemchuda Insorn*

(Miss Khemchuda Insorn)

Analyst

*Araya Tipparuk*

(Mrs. Araya Tipparuk)

Technical Management Team

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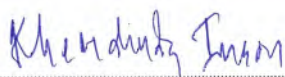
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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 1787/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 12/10/2023	SAMPLING TIME	: 10:57-11:36
RECEIVED DATE	: 13/10/2023	ANALYTICAL DATE	: 13-20/10/2023
REPORT DATE	: 21/10/2023	SITE OPERATOR	: Mr. Watcharakan Pramakhate
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_SW_October
SAMPLE DESCRIPTION	: 1 = Within IEAT drainage channel upstream from refinery outfall 2 = Within IEAT drainage channel downstream from refinery outfall		

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD <sup>1/</sup>
				1	2	
Temperature	°C	2550 B	< 0.5	29.0	29.1	-
pH	-	4500-H <sup>+</sup> B	< 0.10	7.58	7.83	-
Total Dissolved Solids	mg/l	2540 C	< 50	762	908	-
Suspended Solids	mg/l	2540 D	< 5	298	270	-
Ammonia Nitrogen	mg/l	4500-NH <sub>3</sub> B,C	< 0.02	1.1	1.1	-
Sulfide as H <sub>2</sub> S	mg/l	4500-S <sup>2-</sup> F	< 0.20	ND	ND	-
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	ND	-
Phenols	mg/l	5530 B,C	< 0.001	ND	ND	-
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	3.0	3.0	-
COD	mg/l	5220 D	< 40.00	44.20	43.65	-
Chromium Hexavalent (Cr <sup>6+</sup> )	mg/l	3500-Cr B	< 0.01	ND	ND	-
Chromium Trivalent (Cr <sup>3+</sup> )	mg/l	3113 B/Calculation	< 0.001	ND	0.004	-
Mercury (Hg)	mg/l	3112 B	< 0.0005	ND	ND	-

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED., 2017 (AWWA, APHA, WEF)



(Miss Khemchuda Insorn)

Analyst



(Mrs. Araya Tipparuk)

Technical Management Team

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  5. - Not available.





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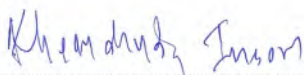
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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 2019/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 16/11/2023	SAMPLING TIME	: 09:54-10:03
RECEIVED DATE	: 17/11/2023	ANALYTICAL DATE	: 17-22/11/2023
REPORT DATE	: 23/11/2023	SITE OPERATOR	: Miss Mareeyanee Hawae
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_SW_November
SAMPLE DESCRIPTION	: 1 = Within IEAT drainage channel upstream from refinery outfall 2 = Within IEAT drainage channel downstream from refinery outfall		

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD <sup>1/</sup>
				1	2	
Temperature	°C	2550 B	< 0.5	30.3	30.5	-
pH	-	4500-H <sup>+</sup> B	< 0.10	7.88	7.98	-
Total Dissolved Solids	mg/l	2540 C	< 50	2,796	2,532	-
Suspended Solids	mg/l	2540 D	< 5	28	26	-
Ammonia Nitrogen	mg/l	4500-NH <sub>3</sub> B,C	< 0.02	1.8	1.5	-
Sulfide as H <sub>2</sub> S	mg/l	4500-S <sup>2-</sup> F	< 0.20	ND	ND	-
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	ND	-
Phenols	mg/l	5530 B,C	< 0.001	ND	ND	-
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	1.6	1.4	-
COD	mg/l	5220 D	< 40.00	< 40.00	< 40.00	-
Chromium Hexavalent (Cr <sup>6+</sup> )	mg/l	3500-Cr B	< 0.01	ND	ND	-
Chromium Trivalent (Cr <sup>3+</sup> )	mg/l	3113 B/Calculation	< 0.001	0.003	ND	-
Mercury (Hg)	mg/l	3112 B	< 0.0005	ND	ND	-

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED.,2017 (AWWA,APHA, WEF)



(Miss Khemchuda Insorn)

Analyst



( Mrs. Araya Tipparuk )

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 2218/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 15/12/2023	SAMPLING TIME	: 11:19-11:30
RECEIVED DATE	: 16/12/2023	ANALYTICAL DATE	: 16-21/12/2023
REPORT DATE	: 22/12/2023	SITE OPERATOR	: Mr. Watcharakan Pramakhate
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_SW_December
SAMPLE DESCRIPTION	: 1 = Within IEAT drainage channel upstream from refinery outfall 2 = Within IEAT drainage channel downstream from refinery outfall		

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD <sup>1/</sup>
				1	2	
Temperature	°C	2550 B	< 0.5	33.2	34.0	-
pH	-	4500-H <sup>+</sup> B	< 0.10	8.02	7.94	-
Total Dissolved Solids	mg/l	2540 C	< 50	4,400	4,464	-
Suspended Solids	mg/l	2540 D	< 5	13	21	-
Ammonia Nitrogen	mg/l	4500-NH <sub>3</sub> B,C	< 0.02	2.6	2.5	-
Sulfide as H <sub>2</sub> S	mg/l	4500-S <sup>2-</sup> F	< 0.20	ND	ND	-
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	ND	-
Phenols	mg/l	5530 B,C	< 0.001	ND	ND	-
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	1.7	1.9	-
COD	mg/l	5220 D	< 40.00	< 40.00	< 40.00	-
Chromium Hexavalent (Cr <sup>6+</sup> )	mg/l	3500-Cr B	< 0.01	ND	ND	-
Chromium Trivalent (Cr <sup>3+</sup> )	mg/l	3113 B/Calculation	< 0.001	0.002	0.004	-
Mercury (Hg)	mg/l	3112 B	< 0.0005	ND	ND	-

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED., 2017 (AWWA, APHA, WEF)



(Miss Khemchuda Insorn)

Analyst



(Mrs. Araya Tipparuk)

Technical Management Team

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 1127/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 06/07/2023	SAMPLING TIME	: 09:00-09:38
RECEIVED DATE	: 07/07/2023	ANALYTICAL DATE	: 07-15/07/2023
REPORT DATE	: 15/07/2023	SITE OPERATOR	: Mr. Watcharakan Pramakhate
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_WW_July
SAMPLE DESCRIPTION	1 = API Separator Effluent 2 = IAF Unit Effluent 3 = Equalization Tank Effluent 4 = Biological Treatment Effluent		

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION			
				1	2	3	4
Temperature	°C	2550 B	< 0.5	31.4	34.2	35.6	34.8
pH	-	4500-H <sup>+</sup> B	< 0.10	9.24	8.60	9.90	7.64
Total Dissolved Solids	mg/l	2540 C	< 50	1,170	690	998	1,180
Suspended Solids	mg/l	2540 D	< 5	< 5	5	< 5	< 5
Fat Oil & Grease	mg/l	5520 B	< 0.50	4.4	1.0	5.0	ND
Phenols	mg/l	5530 B,C* / B,D	< 0.001*, < 0.10	0.41	0.28	2.6	ND*
Sulfide as H <sub>2</sub> S	mg/l	4500-S <sup>2-</sup> F	< 0.20	1.5	0.87	2.7	ND
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	111	22.0	102	1.2
COD	mg/l	5220 D	< 40.00	221	98.61	206	< 40.00
Ammonia Nitrogen	mg/l	4500-NH <sub>3</sub> B,C/Method 350.2*	< 0.02	26.2	4.2	3.9	ND*
Chromium Trivalent (Cr <sup>3+</sup> )	mg/l	3113 B/Calculation	< 0.001	ND	ND	ND	ND
Chromium Hexavalent (Cr <sup>6+</sup> )	mg/l	3500-Cr B	< 0.01	ND	ND	ND	ND
Mercury (Hg)	mg/l	3112 B	< 0.0005	0.0047	0.0005	0.0031	0.0007

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED., 2017 (AWWA, APHA, WEF)

REFERENCE : US, EPA, 1983, Method for Chemical Analysis of Water and Waste, USEPA, EPA 600/4-79/020, Method 350.2.

*Khemchuda Insorn*

( Miss Khemchuda Insorn )

Analyst

REG. NO. ๓-239-ก-5976

*Araya Tipparuk*

( Mrs. Araya Tipparuk )

Technical Management Team

REG. NO. ๓-239-ก-5863

Remark : 1. Reported analysis refers to submitted sample only.

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 1307/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 07/08/2023	SAMPLING TIME	: 09:26-09:56
RECEIVED DATE	: 08/08/2023	ANALYTICAL DATE	: 08-15/08/2023
REPORT DATE	: 16/08/2023	SITE OPERATOR	: Mr. Aniwat Pimwanna
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_WW_August
SAMPLE DESCRIPTION	1 = API Separator Effluent 2 = IAF Unit Effluent 3 = Equalization Tank Effluent 4 = Biological Treatment Effluent		

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION			
				1	2	3	4
Temperature	°C	2550 B	< 0.5	31.2	35.9	34.9	33.3
pH	-	4500-H <sup>+</sup> B	< 0.10	9.44	8.28	10.07	7.67
Total Dissolved Solids	mg/l	2540 C	< 50	1,206	1,140	1,006	930
Suspended Solids	mg/l	2540 D	< 5	6	7	14	< 5
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	ND	1.0	ND
Phenols	mg/l	5530 B,C* / B,D	< 0.001*, < 0.10	0.46	0.22	2.0	ND*
Sulfide as H <sub>2</sub> S	mg/l	4500-S <sup>2-</sup> F	< 0.20	1.1	ND	0.68	ND
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	154	17.3	71.8	< 1.0
COD	mg/l	5220 D	< 40.00	226	63.14	176	< 40.00
Ammonia Nitrogen	mg/l	4500-NH <sub>3</sub> B,C/Method 350.2*	< 0.02	29.9	3.6	7.5	0.06*
Chromium Trivalent (Cr <sup>3+</sup> )	mg/l	3113 B/Calculation	< 0.001	ND	ND	ND	ND
Chromium Hexavalent (Cr <sup>6+</sup> )	mg/l	3500-Cr B	< 0.01	ND	ND	ND	ND
Mercury (Hg)	mg/l	3112 B	< 0.0005	0.0052	ND	0.0008	ND

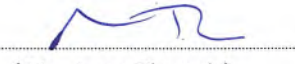
REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED., 2017 (AWWA, APHA, WEF)

REFERENCE : US.EPA, 1983, Method for Chemical Analysis of Water and Waste, USEPA, EPA 600/4-79/020, Method 350.2.

  
( Miss Pornnapa Budthum )

Analyst

REG. NO. ๖-239-๖-0018

  
( Mrs. Araya Tipparuk )

Technical Management Team

REG. NO. ๖-239-๖-0004

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 1601/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 14/09/2023	SAMPLING TIME	: 09:05-10:00
RECEIVED DATE	: 15/09/2023	ANALYTICAL DATE	: 15-21/09/2023
REPORT DATE	: 22/09/2023	SITE OPERATOR	: Miss Thipsuda Wannakran
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_WW_September
SAMPLE DESCRIPTION	1 = API Separator Effluent 2 = IAF Unit Effluent 3 = Equalization Tank Effluent 4 = Biological Treatment Effluent		

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION			
				1	2	3	4
Temperature	°C	2550 B	< 0.5	34.9	34.2	34.3	33.8
pH	-	4500-H <sup>+</sup> B	< 0.10	7.51	7.96	9.82	8.15
Total Dissolved Solids	mg/l	2540 C	< 50	1,200	1,320	1,148	984
Suspended Solids	mg/l	2540 D	< 5	50	20	52	6
Fat Oil & Grease	mg/l	5520 B	< 0.50	5.0	ND	4.1	ND
Phenols	mg/l	5530 B,C* / B,D	< 0.001*, < 0.10	0.90	0.61	2.0	ND*
Sulfide as H <sub>2</sub> S	mg/l	4500-S <sup>2-</sup> F	< 0.20	1.9	0.38	ND	ND
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	45.0	28.6	55.4	< 1.0
COD	mg/l	5220 D	< 40.00	198	102	205	< 40.00
Ammonia Nitrogen	mg/l	4500-NH <sub>3</sub> B,C/Method 350.2*	< 0.02	4.6	4.6	4.8	0.05*
Chromium Trivalent (Cr <sup>3+</sup> )	mg/l	3113 B/Calculation	< 0.001	0.023	0.005	0.007	ND
Chromium Hexavalent (Cr <sup>6+</sup> )	mg/l	3500-Cr B	< 0.01	ND	ND	ND	ND
Mercury (Hg)	mg/l	3112 B	< 0.0005	0.0053	ND	0.0028	0.0017

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED. 2017 (AWWA, APHA, WEF)

REFERENCE : US.EPA. 1983. Method for Chemical Analysis of Water and Waste. USEPA. EPA 600/4-79/020. Method 350.2.

*Khemchuda Insorn*

( Miss Khemchuda Insorn )

Analyst

REG. NO. ๓-239-ก-0005

*Araya Tipparuk*

( Mrs. Araya Tipparuk )

Technical Management Team

REG. NO. ๓-239-ก-0004

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### WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 1789/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 12/10/2023	SAMPLING TIME	: 09.13-09.40
RECEIVED DATE	: 13/10/2023	ANALYTICAL DATE	: 13-20/10/2023
REPORT DATE	: 21/10/2023	SITE OPERATOR	: Miss Thipsuda Wannakran
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_WW_October
SAMPLE DESCRIPTION	1 = API Separator Effluent 2 = IAF Unit Effluent 3 = Equalization Tank Effluent 4 = Biological Treatment Effluent		

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION			
				1	2	3	4
Temperature	°C	2550 B	< 0.5	28.8	31.0	30.8	31.4
pH	-	4500-H <sup>+</sup> B	< 0.10	9.46	7.41	10.56	7.67
Total Dissolved Solids	mg/l	2540 C	< 50	1,076	752	976	904
Suspended Solids	mg/l	2540 D	< 5	5	10	21	9
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	ND	ND	ND
Phenols	mg/l	5530 B,C* / B,D	< 0.001*, < 0.10	0.62	0.23	1.6	ND*
Sulfide as H <sub>2</sub> S	mg/l	4500-S <sup>2-</sup> F	< 0.20	1.0	ND	0.70	ND
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	96.6	6.1	35.9	< 1.0
COD	mg/l	5220 D	< 40.00	264	64.64	152	< 40.00
Ammonia Nitrogen	mg/l	4500-NH <sub>3</sub> B,C/Method 350.2*	< 0.02	38.3	2.6	2.1	0.02*
Chromium Trivalent (Cr <sup>3+</sup> )	mg/l	3113 B/Calculation	< 0.001	0.003	ND	ND	ND
Chromium Hexavalent (Cr <sup>6+</sup> )	mg/l	3500-Cr B	< 0.01	ND	ND	ND	ND
Mercury (Hg)	mg/l	3112 B	< 0.0005	0.0104	ND	0.0006	ND

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED., 2017 (AWWA, APHA, WEF)

REFERENCE : US.EPA, 1983, Method for Chemical Analysis of Water and Waste, USEPA, EPA 600/4-79/020, Method 350.2.

*Khemchuda Insorn*

(Miss Khemchuda Insorn)

Analyst

REG. NO. 3-239-ก-0005

*Araya Tippiaruk*

(Mrs. Araya Tippiaruk)

Technical Management Team

REG. NO. 3-239-ก-0004

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### WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 2018/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 16/11/2023	SAMPLING TIME	: 08.24-08.58
RECEIVED DATE	: 17/11/2023	ANALYTICAL DATE	: 17-22/11/2023
REPORT DATE	: 23/11/2023	SITE OPERATOR	: Miss Mareeyanee Hawae
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_WW_November
SAMPLE DESCRIPTION	1 = API Separator Effluent 2 = IAF Unit Effluent 3 = Equalization Tank Effluent 4 = Biological Treatment Effluent		

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION			
				1	2	3	4
Temperature	<sup>0</sup> C	2550 B	< 0.5	31.4	31.8	32.3	32.1
pH	-	4500-H <sup>+</sup> B	< 0.10	9.40	7.38	10.26	7.77
Total Dissolved Solids	mg/l	2540 C	< 50	1,064	660	714	802
Suspended Solids	mg/l	2540 D	< 5	7	7	20	< 5
Fat Oil & Grease	mg/l	5520 B	< 0.50	0.50	2.2	ND	ND
Phenols	mg/l	5530 B,C* / B,D	< 0.001*, < 0.10	0.53	0.59	2.4	ND*
Sulfide as H <sub>2</sub> S	mg/l	4500-S <sup>2-</sup> F	< 0.20	6.9	4.2	1.2	ND
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	73.4	34.6	61.0	< 1.0
COD	mg/l	5220 D	< 40.00	228	128	220	< 40.00
Ammonia Nitrogen	mg/l	4500-NH <sub>3</sub> B,C/Method 350.2*	< 0.02	33.0	10.0	4.9	ND
Chromium Trivalent (Cr <sup>3+</sup> )	mg/l	3113 B/Calculation	< 0.001	0.001	ND	0.003	ND
Chromium Hexavalent (Cr <sup>6+</sup> )	mg/l	3500-Cr B	< 0.01	ND	ND	ND	ND
Mercury (Hg)	mg/l	3112 B	< 0.0005	0.0079	ND	0.0006	0.0006

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED, 2017 (AWWA, APHA, WEF)

REFERENCE : US.EPA, 1983, Method for Chemical Analysis of Water and Waste, USEPA, EPA 600/4-79/020, Method 350.2.



( Miss Khemchuda Insorn )

Analyst

REG. NO. จ-239-ก-0005



( Mrs. Araya Tipparuk )

Technical Management Team

REG. NO. จ-239-ก-0004

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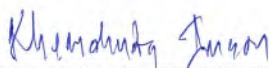
### WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 2217/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 15/12/2023	SAMPLING TIME	: 09.38-10.08
RECEIVED DATE	: 16/12/2023	ANALYTICAL DATE	: 16-21/12/2023
REPORT DATE	: 22/12/2023	SITE OPERATOR	: Mr. Watcharakan Pramakhate
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_WW_December
SAMPLE DESCRIPTION	1 = API Separator Effluent 2 = IAF Unit Effluent 3 = Equalization Tank Effluent 4 = Biological Treatment Effluent		

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION			
				1	2	3	4
Temperature	°C	2550 B	< 0.5	32.4	36.3	37.2	34.7
pH	-	4500-H <sup>+</sup> B	< 0.10	9.28	6.59	9.12	7.16
Total Dissolved Solids	mg/l	2540 C	< 50	954	818	864	1,206
Suspended Solids	mg/l	2540 D	< 5	< 5	8	10	5
Fat Oil & Grease	mg/l	5520 B	< 0.50	0.72	ND	2.4	ND
Phenols	mg/l	5530 B,C* / B,D	< 0.001*, < 0.10	0.58	0.63	2.6	ND*
Sulfide as H <sub>2</sub> S	mg/l	4500-S <sup>2-</sup> F	< 0.20	1.8	1.2	0.91	ND
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	79.0	29.1	49.6	< 1.0
COD	mg/l	5220 D	< 40.00	265	107	248	45.60
Ammonia Nitrogen	mg/l	4500-NH <sub>3</sub> B,C/Method 350.2*	< 0.02	34.2	5.5	11.3	0.09
Chromium Trivalent (Cr <sup>3+</sup> )	mg/l	3113 B/Calculation	< 0.001	0.003	0.001	0.001	0.001
Chromium Hexavalent (Cr <sup>6+</sup> )	mg/l	3500-Cr B	< 0.01	ND	ND	ND	ND
Mercury (Hg)	mg/l	3112 B	< 0.0005	0.0083	ND	0.0005	0.0008

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED. 2017 (AWWA, APHA, WEF)

REFERENCE : US.EPA, 1983, Method for Chemical Analysis of Water and Waste, USEPA, EPA 600/4-79/020, Method 350.2.



( Miss Khemchuda Insorn )

Analyst

REG. NO. ๖-239-ค-0005



( Mrs. Araya Tipparuk )

Technical Management Team

REG. NO. ๖-239-ค-0004

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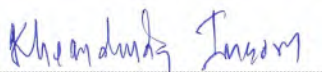
WATER AND WASTEWATER ANALYSIS REPORT


CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 1344/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Integrate
SAMPLING DATE	: 10/08/2023	SAMPLING TIME	: 11:00
RECEIVED DATE	: 11/08/2023	ANALYTICAL DATE	: 11-18/08/2023
REPORT DATE	: 21/08/2023	SITE OPERATOR	: Mr. Baworn Deechaiya
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_CW_August

PARAMETER	UNITS	ANALYSIS METHODS	ND (non-detectable)	SATATION	STANDARD <sup>1/</sup>
				Ko Saket	
Depth	m.	Measurement	-	2.6	-
Temperature	°C	2550 B	< 0.5	30.7	$\Delta \leq 2$
pH	-	4500-H <sup>+</sup> B	< 0.10	8.15	7.0-8.5
Transparency	m.	Secchi Disc	-	2.0	$\Delta \leq 10 \%$
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	-
Fat Oil & Grease	-	Visual Testing	-	NV	NV
Suspended Solid (SS)	mg/l	2540 D	2.5	9.02	<sup>2/</sup>
Ammonia Nitrogen	µg/l	4500-NH <sub>3</sub> F	< 10.0	ND	-
Phenols	mg/l	5530 B-C	< 0.001	ND	$\leq 0.03$
Dissolved Oxygen	mg/l	4500-O G	< 0.10	6.75	$\geq 4$
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	1.1	-
Salinity	ppt	2520 B	< 0.10	30.4	$\Delta \leq 10 \%$
Total Petroleum Hydrocarbon	µg/l	IOC/GGE(MSI)-III/3	< 0.10	ND	$\leq 5$
TOC <sup>*</sup>	µg/l	5310 B	< 0.01	1.61	-
Chromium Trivalent (Cr <sup>3+</sup> )	µg/l	3113 B / Calculation	< 1.00	ND	-
Chromium Hexavalent (Cr <sup>6+</sup> )	µg/l	3113 B	< 1.00	ND	$\leq 50$
Mercury (Hg)	µg/l	3112 B	< 0.05	ND	$\leq 0.1$

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED., 2017 (AWWA, APHA, WEF)

REFERENCE : Intergovernmental Oceanographic Commission of UNESCO (IOC), 1981

  
(Miss Khemchuda Insorn)  
Analyst

  
(Mrs. Araya Tipparuk)  
Technical Management Team

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3. <sup>1/</sup> Notification of the National Environmental Board B.E.2564 (2021) (Class 5).

$\Delta$  : Change from natural condition,  $\leq$  : Not more than, NV : Not visible,  $\geq$  : Not less than.

<sup>2/</sup> The results should not be changed by more than the sum of daily average and the standard deviation.

Daily average was calculated from hourly measurement or at least 5 samples taken at equal time interval within one day.

4. - Not available .



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 2135/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Integrate
SAMPLING DATE	: 04/12/2023	SAMPLING TIME	: 09:44
RECEIVED DATE	: 05/12/2023	ANALYTICAL DATE	: 05-15/12/2023
REPORT DATE	: 15/12/2023	SITE OPERATOR	: Mr. Watcharakan Pramakhate
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_CW_December

PARAMETER	UNITS	ANALYSIS METHODS	ND (non-detectable)	SATATION	STANDARD <sup>1/</sup>
				Ko Saket	
Depth	m.	Measurement	-	3.5	-
Temperature	°C	2550 B	< 0.5	28.6	$\Delta \leq 2$
pH	-	4500-H <sup>+</sup> B	< 0.10	8.14	7.0-8.5
Transparency	m.	Secchi Disc	-	1.0	$\Delta \leq 10 \%$
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	-
Fat Oil & Grease	-	Visual Testing	-	NV	NV
Suspended Solid (SS)	mg/l	2540 D	2.5	7.44	<sup>2/</sup>
Ammonia Nitrogen	µg/l	4500-NH <sub>3</sub> F	< 10.0	13.5	-
Phenols	mg/l	5530 B-C	< 0.001	ND	$\leq 0.03$
Dissolved Oxygen	mg/l	4500-O G	< 0.10	5.95	$\geq 4$
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	< 1.0	-
Salinity	ppt	2520 B	< 0.10	29.9	$\Delta \leq 10 \%$
Total Petroleum Hydrocarbon	µg/l	IOC/GGE(MSI)-III/3	< 0.10	ND	$\leq 5$
TOC <sup>*</sup>	µg/l	5310 B	< 0.01	2.14	-
Arsenic (As)	µg/l	3114 C	< 0.10	1.62	$\leq 10$
Chromium Trivalent (Cr <sup>3+</sup> )	µg/l	3113 B / Calculation	< 1.00	ND	-
Chromium Hexavalent (Cr <sup>6+</sup> )	µg/l	3113 B	< 1.00	ND	$\leq 50$
Mercury (Hg)	µg/l	3112 B	< 0.05	ND	$\leq 0.1$

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED. 2017 (AWWA, APHA, WEF)

REFERENCE : Intergovernmental Oceanographic Commission of UNESCO (IOC).1981

(Miss Khemchuda Insorn)

Analyst

(Mrs. Araya Tipparuk)

Technical Management Team

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3. <sup>1/</sup> Notification of the National Environmental Board B.E.2564 (2021) (Class 5).

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<sup>2/</sup> The results should not be changed by more than the sum of daily average and the standard deviation.

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4. \*TOC analysis was performed by The Office of Public Health and Environmental Technology Services, Faculty of Public Health, Mahidol University.

5. - Not available .





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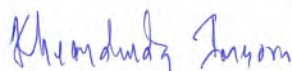
WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 1344/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Integrate
SAMPLING DATE	: 10/08/2023	SAMPLING TIME	: 11:52
RECEIVED DATE	: 11/08/2023	ANALYTICAL DATE	: 11-18/08/2023
REPORT DATE	: 21/08/2023	SITE OPERATOR	: Mr. Baworn Deechaiya
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_CW_August

PARAMETER	UNITS	ANALYSIS METHODS	ND (non-detectable)	SATATION	STANDARD <sup>1/</sup>
				Had Sai Thong Beach	
Depth	m.	Measurement	-	3.0	-
Temperature	°C	2550 B	< 0.5	30.4	$\Delta \leq 1$
Transparency	m.	Secchi Disc	-	1.5	$\Delta \leq 10 \%$
pH	-	4500-H <sup>+</sup> B	< 0.10	8.20	7.0-8.5
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	-
Fat Oil & Grease	-	Visual Testing	-	NV	NV
Suspended Solid (SS)	mg/l	2540 D	2.5	13.64	<sup>2/</sup>
Ammonia Nitrogen	µg/l	4500-NH <sub>3</sub> F	< 10.0	23.8	-
Phenols	mg/l	5530 B-C	< 0.001	ND	$\leq 0.03$
Dissolved Oxygen	mg/l	4500-O G	< 0.10	6.84	$\geq 4$
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	< 1.0	-
Salinity	ppt	2520 B	< 0.10	30.4	$\Delta \leq 10 \%$
Total Petroleum Hydrocarbon	µg/l	IOC/GGE(MSI)-III/3	< 0.10	ND	$\leq 0.5$
TOC <sup>*</sup>	mg/l	5310 B	< 0.01	1.56	-
Chromium Trivalent (Cr <sup>3+</sup> )	µg/l	3113 B / Calculation	< 1.00	ND	-
Chromium Hexavalent (Cr <sup>6+</sup> )	µg/l	3113 B	< 1.00	ND	$\leq 50$
Mercury (Hg)	µg/l	3112 B	< 0.05	ND	$\leq 0.1$

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED. 2017 (AWWA, APHA, WEF)

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(Miss Khemchuda Insorn)

Analyst



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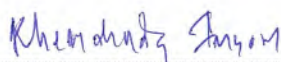
### WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 2135/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Integrate
SAMPLING DATE	: 04/12/2023	SAMPLING TIME	: 10:05
RECEIVED DATE	: 05/12/2023	ANALYTICAL DATE	: 05-15/12/2023
REPORT DATE	: 15/12/2023	SITE OPERATOR	: Mr. Watcharakan Pramakhate
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_CW_December

PARAMETER	UNITS	ANALYSIS METHODS	ND (non-detectable)	SATATION	STANDARD <sup>1/</sup>
				Had Sai Thong Beach	
Depth	m.	Measurement	-	2.8	-
Temperature	°C	2550 B	< 0.5	28.9	$\Delta \leq 1$
Transparency	m.	Secchi Disc	-	0.5	$\Delta \leq 10 \%$
pH	-	4500-H <sup>+</sup> B	< 0.10	8.13	7.0-8.5
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	-
Fat Oil & Grease	-	Visual Testing	-	NV	NV
Suspended Solid (SS)	mg/l	2540 D	2.5	16.56	<sup>2/</sup>
Ammonia Nitrogen	µg/l	4500-NH <sub>3</sub> F	< 10.0	ND	-
Phenols	mg/l	5530 B-C	< 0.001	ND	$\leq 0.03$
Dissolved Oxygen	mg/l	4500-O G	< 0.10	5.93	$\geq 4$
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	< 1.0	-
Salinity	ppt	2520 B	< 0.10	27.2	$\Delta \leq 10 \%$
Total Petroleum Hydrocarbon	µg/l	IOC/GGE(MSI)-III/3	< 0.10	ND	$\leq 0.5$
TOC <sup>*</sup>	mg/l	5310 B	< 0.01	1.76	-
Arsenic (As)	µg/l	3114 C	< 0.10	2.23	$\leq 10$
Chromium Trivalent (Cr <sup>3+</sup> )	µg/l	3113 B / Calculation	< 1.00	ND	-
Chromium Hexavalent (Cr <sup>6+</sup> )	µg/l	3113 B	< 1.00	ND	$\leq 50$
Mercury (Hg)	µg/l	3112 B	< 0.05	ND	$\leq 0.1$

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED., 2017 (AWWA, APHA, WEF)

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(Miss Khemchuda Insorn)

Analyst



(Mrs. Araya Tipparuk)

Technical Management Team

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 1344/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Integrate
SAMPLING DATE	: 10/08/2023	SAMPLING TIME	: 10:24
RECEIVED DATE	: 11/08/2023	ANALYTICAL DATE	: 11-18/08/2023
REPORT DATE	: 21/08/2023	SITE OPERATOR	: Mr. Baworn Deechaiya
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_CW_August

PARAMETER	UNITS	ANALYSIS METHODS	ND (non-detectable)	SATATION Wastewater Discharge Point of Refinery (IEAT)	STANDARD <sup>1/</sup>
Depth	m.	Measurement	-	2.0	-
Temperature	°C	2550 B	< 0.5	30.3	$\Delta \leq 2$
Transparency	m.	Secchi Disc	-	1.5	$\Delta \leq 10 \%$
pH	-	4500-H <sup>+</sup> B	< 0.10	8.11	7.0-8.5
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	-
Fat Oil & Grease	-	Visual Testing	-	NV	NV
Suspended Solid (SS)	mg/l	2540 D	2.5	17.48	<sup>2/</sup>
Ammonia Nitrogen	µg/l	4500-NH <sub>3</sub> F	< 10.0	70.5	-
Phenols	mg/l	5530 B-C	< 0.001	ND	$\leq 0.03$
Dissolved Oxygen	mg/l	4500-O G	< 0.10	6.0	$\geq 4$
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	< 1.0	-
Salinity	ppt	2520 B	< 0.10	30.0	$\Delta \leq 10 \%$
Chromium Trivalent (Cr <sup>3+</sup> )	µg/l	3113 B / Calculation	< 1.00	ND	-
Chromium Hexavalent (Cr <sup>6+</sup> )	µg/l	3113 B	< 1.00	ND	$\leq 50$
Mercury (Hg)	µg/l	3112 B	< 0.05	ND	$\leq 0.1$

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED. 2017 (AWWA, APHA, WEF)

REFERENCE : Intergovernmental Oceanographic Commission of UNESCO (IOC), 1981

(Miss Khemchuda Insorn)

Analyst

(Mrs. Araya Tipparuk)

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4. - Not available .





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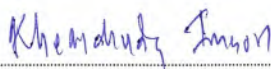
### WATER AND WASTEWATER ANALYSIS REPORT


CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 2135/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Integrate
SAMPLING DATE	: 04/12/2023	SAMPLING TIME	: 09:35
RECEIVED DATE	: 05/12/2023	ANALYTICAL DATE	: 05-15/12/2023
REPORT DATE	: 15/12/2023	SITE OPERATOR	: Mr. Watcharakan Pramakhate
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_CW_December

PARAMETER	UNITS	ANALYSIS METHODS	ND (non-detectable)	SATATION	STANDARD <sup>1/</sup>
				Wastewater Discharge Point of Refinery (IEAT)	
Depth	m.	Measurement	-	4.5	-
Temperature	°C	2550 B	< 0.5	28.7	$\Delta \leq 2$
Transparency	m.	Secchi Disc	-	0.8	$\Delta \leq 10 \%$
pH	-	4500-H <sup>+</sup> B	< 0.10	8.11	7.0-8.5
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	-
Fat Oil & Grease	-	Visual Testing	-	NV	NV
Suspended Solid (SS)	mg/l	2540 D	2.5	20.47	<sup>2/</sup>
Ammonia Nitrogen	µg/l	4500-NH <sub>3</sub> F	< 10.0	48.7	-
Phenols	mg/l	5530 B-C	< 0.001	ND	$\leq 0.03$
Dissolved Oxygen	mg/l	4500-O G	< 0.10	5.51	$\geq 4$
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	1.5	-
Salinity	ppt	2520 B	< 0.10	30.1	$\Delta \leq 10 \%$
Chromium Trivalent (Cr <sup>3+</sup> )	µg/l	3113 B / Calculation	< 1.00	ND	-
Chromium Hexavalent (Cr <sup>6+</sup> )	µg/l	3113 B	< 1.00	ND	$\leq 50$
Mercury (Hg)	µg/l	3112 B	< 0.05	ND	$\leq 0.1$

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED. 2017 (AWWA, APHA, WEF)

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(Miss Khemchuda Insorn)  
Analyst

  
(Mrs. Araya Tipparuk)  
Technical Management Team

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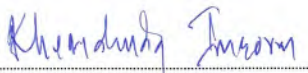
### WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 1344/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Integrate
SAMPLING DATE	: 10/08/2023	SAMPLING TIME	: 11:23
RECEIVED DATE	: 11/08/2023	ANALYTICAL DATE	: 11-18/08/2023
REPORT DATE	: 21/08/2023	SITE OPERATOR	: Mr. Baworn Deechaiya
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_CW_August

PARAMETER	UNITS	ANALYSIS METHODS	ND (non-detectable)	SATATION	STANDARD <sup>1/</sup>
				Open Coastal Water	
Depth	m.	Measurement	-	3.1	-
Temperature	°C	2550 B	< 0.5	29.9	$\Delta \leq 2$
Transparency	m.	Secchi Disc	< 0.10	2.5	$\Delta \leq 10 \%$
pH	-	4500-H <sup>+</sup> B	-	8.17	7.0-8.5
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	-
Fat Oil & Grease	-	Visual Testing	-	NV	NV
Suspended Solid (SS)	mg/l	2540 D	2.5	3.16	<sup>2/</sup>
Ammonia Nitrogen	µg/l	4500-NH <sub>3</sub> F	< 10.0	17.6	-
Phenols	mg/l	5530 B-C	< 0.001	ND	$\leq 0.03$
Dissolved Oxygen	mg/l	4500-O G	< 0.10	6.90	$\geq 4$
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	< 1.0	-
Salinity	ppt	2520 B	< 0.10	30.7	$\Delta \leq 10 \%$
Total Petroleum Hydrocarbon	µg/l	IOC/GGE(MSI)-III/3	< 0.10	ND	$\leq 5$
TOC <sup>*</sup>	mg/l	5310 B	< 0.01	1.90	-
Chromium Trivalent (Cr <sup>3+</sup> )	µg/l	3113 B / Calculation	< 1.00	ND	-
Chromium Hexavalent (Cr <sup>6+</sup> )	µg/l	3113 B	< 1.00	ND	$\leq 50$
Mercury (Hg)	µg/l	3112 B	< 0.05	ND	$\leq 0.1$

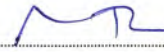
REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED., 2017 (AWWA, APHA, WEF)

REFERENCE : Intergovernmental Oceanographic Commission of UNESCO (IOC), 1981



(Miss Khemchuda Insorn)

Analyst



(Mrs. Araya Tipparuk)

Technical Management Team

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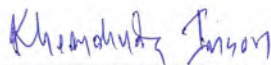
WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 2135/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Integrate
SAMPLING DATE	: 04/12/2023	SAMPLING TIME	: 09:58
RECEIVED DATE	: 05/12/2023	ANALYTICAL DATE	: 05-15/12/2023
REPORT DATE	: 15/12/2023	SITE OPERATOR	: Mr. Watcharakan Pramakhate
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_CW_December

PARAMETER	UNITS	ANALYSIS METHODS	ND (non-detectable)	SATATION	STANDARD <sup>1/</sup>
				Open Coastal Water	
Depth	m.	Measurement	-	5.3	-
Temperature	°C	2550 B	< 0.5	28.5	$\Delta \leq 2$
Transparency	m.	Secchi Disc	< 0.10	2.0	$\Delta \leq 10 \%$
pH	-	4500-H <sup>+</sup> B	-	8.19	7.0-8.5
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	-
Fat Oil & Grease	-	Visual Testing	-	NV	NV
Suspended Solid (SS)	mg/l	2540 D	2.5	9.64	<sup>2/</sup>
Ammonia Nitrogen	µg/l	4500-NH <sub>3</sub> F	< 10.0	ND	-
Phenols	mg/l	5530 B-C	< 0.001	ND	$\leq 0.03$
Dissolved Oxygen	mg/l	4500-O G	< 0.10	5.33	$\geq 4$
BOD <sub>5</sub>	mg/l	5210 B	< 1.0	< 1.0	-
Salinity	ppt	2520 B	< 0.10	30.4	$\Delta \leq 10 \%$
Total Petroleum Hydrocarbon	µg/l	IOC/GGE(MSI)-III/3	< 0.10	0.15	$\leq 5$
TOC <sup>*</sup>	mg/l	5310 B	< 0.01	1.59	-
Arsenic (As)	µg/l	3114 C	< 0.10	1.21	$\leq 10$
Chromium Trivalent (Cr <sup>3+</sup> )	µg/l	3113 B / Calculation	< 1.00	ND	-
Chromium Hexavalent (Cr <sup>6+</sup> )	µg/l	3113 B	< 1.00	ND	$\leq 50$
Mercury (Hg)	µg/l	3112 B	< 0.05	ND	$\leq 0.1$

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED.2017 (AWWA,APHA, WEF)

REFERENCE : Intergovernmental Oceanographic Commission of UNESCO (IOC),1981



(Miss Khemchuda Insorn)

Analyst



(Mrs. Araya Tipparuk)

Technical Management Team

**Remark :** 1. Reported analysis refers to submitted sample only.

2. This report shall not be reproduced, except in full, without official approval.

3. <sup>1/</sup> Notification of the National Environmental Board B.E.2564 (2021) (Class 5).

$\Delta$  : Change from natural condition,  $\leq$  : Not more than, NV : Not visible,  $\geq$  : Not less than.

<sup>2/</sup> The results should not be changed by more than the sum of daily average and the standard deviation.

Daily average was calculated from hourly measurement or at least 5 samples taken at equal time interval within one day.

4. \*TOC analysis was performed by The Office of Public Health and Environmental Technology Services, Faculty of Public Health, Mahidol University.

5. - Not available .

## ใบรับรองผลการตรวจวัดระดับเสียง





## Noise Monitoring Result : Community Noise

### MTR-SPRC PLC-Refinery

Location : Main Office Complex

Monitor Period : 16-23 Nov 2023

SLM Model : Cirrus CR162B

Serial No : G302333

Site Operator : Mr. Suphachai Sukmai

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : 20 Dec 2022

SLM Reading / Adjust dB(A) : 93.4/0.3

Expire Date : 19 Dec 2023

Cal Sheet No.: CR-515-2023-229

Time	Equivalent Sound Pressure Level (dB(A))						
	16-17 Nov 2023	17-18 Nov 2023	18-19 Nov 2023	19-20 Nov 2023	20-21 Nov 2023	21-22 Nov 2023	22-23 Nov 2023
12:00 - 13:00	59.5	59.8	60.7	60.6	60.4	60.4	60.1
13:00 - 14:00	59.6	60.1	64.6	60.9	59.9	59.6	61.4
14:00 - 15:00	55.2	57.7	78.1	58.1	58.3	57.1	59.4
15:00 - 16:00	57.1	58.4	79.4	58.8	61.0	59.4	60.8
16:00 - 17:00	63.1	59.8	75.4	58.7	60.0	60.2	60.7
17:00 - 18:00	59.7	59.8	58.6	58.6	60.0	60.4	60.4
18:00 - 19:00	58.8	58.1	57.9	57.8	59.4	59.9	60.3
19:00 - 20:00	57.2	57.3	57.5	57.1	57.9	58.2	59.8
20:00 - 21:00	53.4	52.7	53.6	53.7	53.3	54.6	55.2
21:00 - 22:00	52.8	51.6	53.6	53.9	53.2	54.2	53.2
22:00 - 23:00	51.8	52.3	53.4	54.3	55.2	54.6	53.1
23:00 - 00:00	52.8	53.1	54.4	54.6	55.2	56.3	55.4
00:00 - 01:00	51.0	51.0	54.0	53.8	53.9	55.2	53.4
01:00 - 02:00	53.3	51.0	53.3	54.0	55.0	54.5	55.3
02:00 - 03:00	52.9	51.2	52.9	54.0	55.1	55.2	55.5
03:00 - 04:00	53.9	51.3	51.2	53.9	55.0	54.2	55.4
04:00 - 05:00	54.7	51.6	52.9	54.7	56.6	55.2	56.4
05:00 - 06:00	55.9	54.5	54.5	55.9	56.8	56.1	57.0
06:00 - 07:00	59.3	57.5	56.4	58.7	59.3	58.9	59.0
07:00 - 08:00	60.8	60.9	62.0	61.3	60.8	60.6	61.7
08:00 - 09:00	60.2	65.6	60.1	60.5	60.2	60.4	61.0
09:00 - 10:00	60.6	60.3	60.6	61.0	60.0	59.9	60.8
10:00 - 11:00	61.0	60.8	60.7	60.9	60.3	59.9	60.6
11:00 - 12:00	59.6	63.1	59.5	59.8	58.8	59.4	59.6
Leq(24)*	58.1	58.7	69.2	58.2	58.4	58.3	59.0
Ldn	62.2	61.6	69.6	62.5	63.1	62.9	63.3
Lmax **	77.7	89.6	97.4	80.2	82.1	82.8	78.4
Standard-24Hr	70 dB(A)						
Standard-Max	115 dB(A)						

Remark : \* Average time between 12:00-12:00

\*\* Maximum Sound Pressure Level between 12:00-12:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team



## Noise Monitoring Result : Background Noise

### MTR-SPRC PLC-Refinery

Location : Main Office Complex

Monitor Period : 16-23 Nov 2023

SLM Model : Cirrus CR162B

Serial No : G302333

Site Operator : Mr. Suphachai Sukmai

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : 20 Dec 2022

SLM Reading / Adjust dB(A) : 93.4/0.3

Expire Date : 19 Dec 2023

Cal Sheet No.: CR-515-2023-229

Time	L90 (dB(A))						
	16-17 Nov 2023	17-18 Nov 2023	18-19 Nov 2023	19-20 Nov 2023	20-21 Nov 2023	21-22 Nov 2023	22-23 Nov 2023
12:00 - 13:00	57.3	58.4	59.3	59.5	59.3	59.0	57.9
13:00 - 14:00	57.7	58.5	59.4	59.3	58.2	58.6	59.1
14:00 - 15:00	50.8	55.1	57.9	56.0	56.2	53.0	57.6
15:00 - 16:00	55.7	56.9	57.8	57.3	57.3	57.6	58.8
16:00 - 17:00	56.6	56.6	57.5	56.7	57.3	58.3	58.7
17:00 - 18:00	57.6	56.8	56.4	56.8	58.4	58.6	58.5
18:00 - 19:00	56.6	56.0	56.3	56.2	57.8	58.1	58.8
19:00 - 20:00	55.8	55.8	56.1	56.1	56.7	56.8	58.3
20:00 - 21:00	49.5	49.3	50.7	50.1	50.1	51.2	50.7
21:00 - 22:00	48.9	49.0	50.7	51.5	50.4	50.9	50.6
22:00 - 23:00	48.3	49.7	50.2	52.2	52.9	52.4	50.5
23:00 - 00:00	49.0	50.5	51.5	52.4	52.6	53.4	51.1
00:00 - 01:00	49.3	49.3	51.6	51.8	52.2	53.2	51.0
01:00 - 02:00	51.2	49.4	51.2	52.1	52.9	52.4	53.5
02:00 - 03:00	50.4	49.5	50.4	52.0	53.1	52.9	53.7
03:00 - 04:00	51.9	49.6	49.1	51.9	52.9	52.3	53.5
04:00 - 05:00	52.1	49.9	49.8	52.1	53.1	52.7	53.4
05:00 - 06:00	52.5	50.4	50.8	52.5	53.3	52.7	54.0
06:00 - 07:00	55.0	52.1	52.7	54.3	55.0	54.5	54.7
07:00 - 08:00	58.1	57.3	57.2	58.2	58.1	57.7	59.0
08:00 - 09:00	58.9	59.8	58.6	59.1	58.9	58.5	59.5
09:00 - 10:00	59.6	59.3	59.6	59.5	59.1	58.8	59.7
10:00 - 11:00	59.5	59.3	59.8	59.7	59.3	59.1	59.5
11:00 - 12:00	57.1	58.0	58.2	58.2	57.6	57.5	57.8
L90(avg)*	55.6	55.7	56.2	56.3	56.4	56.3	56.9

Remark : \* Average time between 12:00-12:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team





## Noise Monitoring Result : Community Noise

### MTR-SPRC PLC-Refinery

Location : Central Control Building

Monitor Period : 16-23 Nov 2023

SLM Model : Cirrus CR162B

Serial No : G300769

Site Operator : Mr. Suphachai Sukmai

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : 20 Dec 2022

SLM Reading / Adjust dB(A) : 93.7/0.0

Expire Date : 19 Dec 2023

Cal Sheet No.: CR-515-2023-229

Time	Equivalent Sound Pressure Level (dB(A))						
	16-17 Nov 2023	17-18 Nov 2023	18-19 Nov 2023	19-20 Nov 2023	20-21 Nov 2023	21-22 Nov 2023	22-23 Nov 2023
11:00 - 12:00	65.8	65.6	65.6	65.1	65.2	64.6	66.2
12:00 - 13:00	65.5	65.5	65.3	65.1	64.8	64.6	65.8
13:00 - 14:00	66.2	65.6	65.3	64.9	65.2	65.2	68.8
14:00 - 15:00	65.6	65.4	64.9	64.7	65.8	66.1	66.1
15:00 - 16:00	65.7	65.3	64.9	64.7	65.8	65.7	66.0
16:00 - 17:00	66.4	65.4	65.1	64.9	65.9	65.9	65.9
17:00 - 18:00	66.7	65.8	65.5	65.5	66.3	66.2	66.2
18:00 - 19:00	66.5	65.8	65.9	65.8	66.3	66.1	66.2
19:00 - 20:00	66.3	65.6	65.9	65.7	65.7	65.8	66.0
20:00 - 21:00	66.2	65.6	66.1	65.8	65.5	65.4	65.8
21:00 - 22:00	66.1	65.7	66.0	65.9	65.7	65.4	65.6
22:00 - 23:00	66.1	65.9	65.8	66.1	65.5	65.7	65.6
23:00 - 00:00	66.4	66.0	66.1	66.4	65.8	65.9	65.8
00:00 - 01:00	66.2	65.9	65.9	66.2	65.7	65.7	65.6
01:00 - 02:00	66.2	66.0	66.1	66.1	65.9	65.7	65.7
02:00 - 03:00	66.1	66.1	66.1	66.2	66.0	65.9	65.8
03:00 - 04:00	66.0	65.8	65.9	66.2	66.0	65.9	65.7
04:00 - 05:00	66.1	65.9	66.0	66.3	66.1	66.0	65.8
05:00 - 06:00	66.2	66.0	66.2	66.4	66.3	66.0	65.9
06:00 - 07:00	66.1	66.0	66.2	66.4	66.3	66.0	65.9
07:00 - 08:00	66.4	68.1	68.3	70.6	68.5	66.4	70.2
08:00 - 09:00	65.8	65.8	65.7	66.0	65.7	65.7	66.6
09:00 - 10:00	65.6	65.7	65.4	65.8	65.2	65.2	66.1
10:00 - 11:00	65.6	65.7	65.3	65.6	65.0	65.0	65.6
Leq(24)*	66.1	65.9	65.9	66.1	65.9	65.7	66.4
Ldn	72.6	72.3	72.4	72.6	72.4	72.2	72.3
Lmax **	85.7	91.8	94.6	96.3	94.7	86.9	95.1
Standard-24Hr	70 dB(A)						
Standard-Max	115 dB(A)						

Remark : \* Average time between 11:00-11:00

\*\* Maximum Sound Pressure Level between 11:00-11:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team





## Noise Monitoring Result : Background Noise

### MTR-SPRC PLC-Refinery

Location : Central Control Building

Monitor Period : 16-23 Nov 2023

SLM Model : Cirrus CR162B

Serial No : G300769

Site Operator : Mr. Suphachai Sukmai

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : 20 Dec 2022

SLM Reading / Adjust dB(A) : 93.7/0.0

Expire Date : 19 Dec 2023

Cal Sheet No.: CR-515-2023-229

Time	L90 (dB(A))						
	16-17 Nov 2023	17-18 Nov 2023	18-19 Nov 2023	19-20 Nov 2023	20-21 Nov 2023	21-22 Nov 2023	22-23 Nov 2023
11:00 - 12:00	65.2	65.0	65.0	64.6	64.5	64.1	64.5
12:00 - 13:00	65.0	64.9	64.9	64.6	64.3	64.2	65.1
13:00 - 14:00	65.6	65.0	64.7	64.4	64.5	64.5	65.3
14:00 - 15:00	65.0	64.9	64.4	64.3	65.0	65.0	65.3
15:00 - 16:00	65.2	64.8	64.4	64.3	65.3	65.1	65.4
16:00 - 17:00	65.6	64.8	64.6	64.5	65.5	65.4	65.4
17:00 - 18:00	66.1	65.1	64.7	64.7	65.7	65.6	65.6
18:00 - 19:00	66.0	65.2	65.4	65.3	65.9	65.7	65.7
19:00 - 20:00	66.0	65.2	65.5	65.4	65.3	65.4	65.7
20:00 - 21:00	65.9	65.2	65.8	65.5	65.2	65.2	65.5
21:00 - 22:00	65.8	65.2	65.7	65.6	65.4	65.1	65.3
22:00 - 23:00	65.8	65.4	65.5	65.8	65.3	65.4	65.3
23:00 - 00:00	66.0	65.5	65.7	65.9	65.4	65.6	65.4
00:00 - 01:00	65.7	65.4	65.5	65.9	65.4	65.4	65.4
01:00 - 02:00	65.8	65.6	65.8	65.8	65.5	65.5	65.4
02:00 - 03:00	65.7	65.6	65.7	65.8	65.5	65.6	65.5
03:00 - 04:00	65.6	65.3	65.5	65.9	65.6	65.6	65.4
04:00 - 05:00	65.7	65.5	65.6	66.0	65.6	65.7	65.5
05:00 - 06:00	65.8	65.6	65.9	66.1	65.8	65.7	65.6
06:00 - 07:00	65.6	65.6	65.8	66.0	65.7	65.7	65.4
07:00 - 08:00	65.3	65.5	65.6	65.7	65.6	65.4	65.5
08:00 - 09:00	65.1	65.2	65.2	65.3	65.1	65.0	65.8
09:00 - 10:00	64.9	65.2	64.8	64.9	64.6	64.6	65.3
10:00 - 11:00	65.0	65.2	64.7	64.7	64.4	64.5	64.8
L90(avg)*	65.6	65.3	65.3	65.3	65.3	65.2	65.4

Remark : \* Average time between 11:00-11:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team



## Noise Monitoring Result : Community Noise

### MTR-SPRC PLC-Refinery

Location : Northern Refinery Boundary Station 1

Monitor Period : 16-23 Nov 2023

SLM Model : Cirrus CR162B

Serial No : G302738

Site Operator : Mr. Suphachai Sukmai

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : 20 Dec 2022

SLM Reading / Adjust dB(A) : 93.6/0.1

Expire Date : 19 Dec 2023

Cal Sheet No.: CR-515-2023-229

Time	Equivalent Sound Pressure Level (dB(A))						
	16-17 Nov 2023	17-18 Nov 2023	18-19 Nov 2023	19-20 Nov 2023	20-21 Nov 2023	21-22 Nov 2023	22-23 Nov 2023
12:00 - 13:00	56.8	55.6	58.1	54.5	55.3	55.6	56.4
13:00 - 14:00	56.2	55.5	56.4	55.7	55.3	54.8	58.4
14:00 - 15:00	53.8	53.7	59.8	54.6	56.4	54.8	55.7
15:00 - 16:00	53.8	54.7	57.4	55.5	57.1	57.1	57.8
16:00 - 17:00	62.6	59.8	60.0	56.7	60.4	60.5	60.8
17:00 - 18:00	60.6	59.3	57.8	56.3	59.0	61.1	59.9
18:00 - 19:00	60.2	58.6	56.8	58.1	59.2	59.4	59.5
19:00 - 20:00	56.7	55.5	55.1	54.6	55.8	56.1	57.5
20:00 - 21:00	57.0	54.6	53.1	52.4	55.1	54.7	53.7
21:00 - 22:00	52.7	52.4	53.4	52.1	54.3	52.6	52.2
22:00 - 23:00	53.8	53.2	55.6	52.6	52.3	51.9	50.8
23:00 - 00:00	49.9	52.1	52.5	52.3	52.3	52.3	50.2
00:00 - 01:00	48.1	50.0	51.9	52.2	51.1	51.5	49.5
01:00 - 02:00	48.3	49.9	50.6	50.8	51.4	51.4	50.9
02:00 - 03:00	48.5	49.9	50.4	50.9	51.5	51.3	51.2
03:00 - 04:00	48.4	51.3	48.7	50.3	51.2	50.9	51.5
04:00 - 05:00	48.7	51.6	49.9	51.4	53.7	51.3	51.3
05:00 - 06:00	52.5	52.6	51.7	53.1	53.6	53.2	53.0
06:00 - 07:00	61.1	60.4	57.5	60.5	60.9	60.1	61.1
07:00 - 08:00	63.1	63.0	59.0	62.7	62.7	63.1	62.8
08:00 - 09:00	59.9	75.1	56.4	57.5	58.8	58.4	58.8
09:00 - 10:00	56.5	53.6	57.5	55.5	55.3	54.4	56.4
10:00 - 11:00	55.0	58.3	55.3	57.5	55.3	53.6	55.9
11:00 - 12:00	57.2	56.3	57.5	57.7	56.0	55.4	58.5
Leq(24)*	57.3	62.5	56.2	56.1	56.8	56.8	57.2
Ldn	61.3	64.2	60.4	61.1	61.6	61.2	61.5
Lmax **	84.8	93.3	88.1	85.1	84.2	88.3	85.4
Standard-24Hr	70 dB(A)						
Standard-Max	115 dB(A)						

Remark : \* Average time between 12:00-12:00

\*\* Maximum Sound Pressure Level between 12:00-12:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team





## Noise Monitoring Result : Background Noise

### MTR-SPRC PLC-Refinery

Location : Northern Refinery Boundary Station 1

Monitor Period : 16-23 Nov 2023

SLM Model : Cirrus CR162B

Serial No : G302738

Site Operator : Mr. Suphachai Sukmai

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : 20 Dec 2022

SLM Reading / Adjust dB(A) : 93.6/0.1

Expire Date : 19 Dec 2023

Cal Sheet No.: CR-515-2023-229

Time	L90 (dB(A))						
	16-17 Nov 2023	17-18 Nov 2023	18-19 Nov 2023	19-20 Nov 2023	20-21 Nov 2023	21-22 Nov 2023	22-23 Nov 2023
12:00 - 13:00	47.5	48.3	47.9	49.1	47.3	49.6	51.0
13:00 - 14:00	49.9	47.3	48.7	50.3	46.8	47.1	52.1
14:00 - 15:00	45.6	46.8	51.4	49.4	48.1	46.2	52.5
15:00 - 16:00	46.8	47.0	49.4	49.5	51.6	50.0	52.6
16:00 - 17:00	51.3	49.4	50.4	49.8	52.4	51.7	52.8
17:00 - 18:00	53.4	50.1	48.5	50.0	53.3	53.5	53.3
18:00 - 19:00	51.8	48.4	49.0	49.1	51.9	51.9	53.7
19:00 - 20:00	49.8	48.3	49.0	48.8	49.7	51.1	51.3
20:00 - 21:00	48.2	47.9	49.1	48.7	48.5	49.0	48.0
21:00 - 22:00	48.3	47.9	49.0	49.4	48.4	48.7	48.2
22:00 - 23:00	47.9	48.5	48.7	49.8	50.2	50.0	47.8
23:00 - 00:00	47.6	49.3	50.1	50.0	49.9	50.4	47.8
00:00 - 01:00	46.0	48.1	49.9	50.6	49.6	50.3	48.1
01:00 - 02:00	46.3	48.2	49.2	49.4	50.0	49.7	49.8
02:00 - 03:00	46.8	47.8	48.2	49.2	50.0	49.9	50.1
03:00 - 04:00	46.2	48.4	47.1	49.0	49.6	49.4	49.9
04:00 - 05:00	46.2	48.6	47.5	49.2	49.8	49.7	49.8
05:00 - 06:00	47.5	48.8	48.9	49.5	49.9	49.6	50.3
06:00 - 07:00	51.5	50.9	50.5	52.1	52.1	52.0	51.8
07:00 - 08:00	52.8	51.1	50.4	51.5	51.5	51.7	54.0
08:00 - 09:00	50.9	54.1	50.1	49.6	49.2	48.1	51.5
09:00 - 10:00	49.6	49.4	50.6	49.0	47.9	46.5	50.3
10:00 - 11:00	48.6	49.1	49.9	48.9	46.7	46.8	49.5
11:00 - 12:00	47.7	48.5	49.5	48.6	47.6	47.0	50.1
L90(avg)*	49.3	49.2	49.4	49.7	50.0	50.0	51.1

Remark : \* Average time between 12:00-12:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team





## Noise Monitoring Result : Community Noise

### MTR-SPRC PLC-Refinery

Location : Northern Refinery Boundary Station 2

Monitor Period : 16-23 Nov 2023

SLM Model : Cirrus CR162B

Serial No : G302737

Site Operator : Mr. Suphachai Sukmai

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : 20 Dec 2022

SLM Reading / Adjust dB(A) : 93.4/0.3

Expire Date : 19 Dec 2023

Cal Sheet No.: CR-515-2023-229

Time	Equivalent Sound Pressure Level (dB(A))						
	16-17 Nov 2023	17-18 Nov 2023	18-19 Nov 2023	19-20 Nov 2023	20-21 Nov 2023	21-22 Nov 2023	22-23 Nov 2023
12:00 - 13:00	55.2	51.6	52.2	51.4	52.0	52.9	58.2
13:00 - 14:00	53.5	51.8	53.1	51.3	57.3	52.1	56.5
14:00 - 15:00	52.0	51.5	52.4	50.8	54.5	53.3	56.8
15:00 - 16:00	51.7	51.7	52.6	51.1	53.5	53.8	56.1
16:00 - 17:00	58.6	53.9	54.0	51.7	55.4	56.2	56.9
17:00 - 18:00	53.3	53.5	51.0	50.8	53.9	54.7	54.6
18:00 - 19:00	53.4	53.0	52.7	50.5	54.8	55.8	55.7
19:00 - 20:00	51.1	50.8	50.9	50.1	50.6	53.6	55.2
20:00 - 21:00	50.1	50.4	51.1	50.3	51.9	50.9	52.8
21:00 - 22:00	50.7	50.7	51.4	51.9	51.1	50.4	50.3
22:00 - 23:00	49.4	50.9	51.1	51.1	50.8	50.1	49.1
23:00 - 00:00	49.1	52.3	52.0	51.1	51.1	50.3	49.8
00:00 - 01:00	48.4	52.4	51.1	50.3	50.7	50.4	48.3
01:00 - 02:00	50.3	52.1	50.6	51.1	50.8	50.4	49.0
02:00 - 03:00	49.1	52.5	50.6	49.7	50.6	50.2	49.5
03:00 - 04:00	48.8	50.8	49.7	49.6	49.7	49.7	51.0
04:00 - 05:00	48.9	51.0	50.5	49.8	51.0	49.6	51.6
05:00 - 06:00	51.1	51.3	51.5	51.3	51.3	50.8	51.7
06:00 - 07:00	54.6	54.2	52.5	55.0	52.5	54.6	54.8
07:00 - 08:00	54.9	55.0	52.8	55.0	52.8	54.0	55.0
08:00 - 09:00	53.0	51.8	53.0	53.8	53.0	55.1	56.5
09:00 - 10:00	51.8	50.7	51.7	52.0	52.0	53.3	54.8
10:00 - 11:00	52.8	51.3	51.6	51.0	51.4	53.5	53.0
11:00 - 12:00	53.0	52.6	51.8	52.1	50.9	54.8	52.3
Leq(24)*	52.6	52.2	51.9	51.6	52.7	53.0	54.2
Ldn	57.5	58.5	57.7	57.8	57.9	57.9	58.4
Lmax **	84.7	69.8	74.1	70.4	75.6	73.9	73.3
Standard-24Hr	70 dB(A)						
Standard-Max	115 dB(A)						

Remark : \* Average time between 12:00-12:00

\*\* Maximum Sound Pressure Level between 12:00-12:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team



## Noise Monitoring Result : Background Noise

### MTR-SPRC PLC-Refinery

Location : Northern Refinery Boundary Station 2

Monitor Period : 16-23 Nov 2023

SLM Model : Cirrus CR162B

Serial No : G302737

Site Operator : Mr. Suphachai Sukmai

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : 20 Dec 2022

SLM Reading / Adjust dB(A) : 93.4/0.3

Expire Date : 19 Dec 2023

Cal Sheet No.: CR-515-2023-229

Time	L90 (dB(A))						
	16-17 Nov 2023	17-18 Nov 2023	18-19 Nov 2023	19-20 Nov 2023	20-21 Nov 2023	21-22 Nov 2023	22-23 Nov 2023
12:00 - 13:00	49.1	49.7	50.1	48.8	49.0	49.1	52.9
13:00 - 14:00	50.9	49.8	50.9	48.2	50.1	49.8	53.7
14:00 - 15:00	49.9	49.6	49.4	48.6	50.4	50.3	53.7
15:00 - 16:00	49.6	49.9	49.2	48.2	51.3	51.0	54.0
16:00 - 17:00	51.0	50.4	49.1	48.6	51.8	52.6	53.8
17:00 - 18:00	51.5	50.8	49.3	49.2	52.4	52.9	52.8
18:00 - 19:00	49.8	49.7	49.6	48.9	52.0	53.8	53.7
19:00 - 20:00	49.6	48.9	49.5	49.0	48.9	49.7	53.5
20:00 - 21:00	48.0	49.0	49.8	48.9	48.6	48.5	50.4
21:00 - 22:00	48.5	48.8	49.7	49.8	48.7	47.9	48.0
22:00 - 23:00	48.1	49.3	49.7	49.8	49.3	48.8	47.6
23:00 - 00:00	47.9	50.2	50.4	49.8	49.6	48.8	47.4
00:00 - 01:00	47.1	50.5	49.7	48.9	49.3	48.6	46.9
01:00 - 02:00	47.6	50.3	49.4	48.8	49.5	48.5	47.7
02:00 - 03:00	48.0	49.7	49.3	48.4	49.3	48.6	48.4
03:00 - 04:00	47.6	49.5	48.6	48.3	48.6	48.2	48.9
04:00 - 05:00	47.6	49.6	48.7	48.4	49.6	48.2	49.2
05:00 - 06:00	48.7	49.6	49.5	48.9	49.6	48.4	49.6
06:00 - 07:00	50.7	51.0	50.6	51.6	50.6	50.9	51.6
07:00 - 08:00	52.0	51.1	50.7	51.8	50.7	50.9	51.8
08:00 - 09:00	50.7	49.4	50.0	50.4	50.0	50.1	51.4
09:00 - 10:00	49.3	49.2	49.6	49.5	49.5	49.7	50.1
10:00 - 11:00	50.7	48.9	49.5	48.4	48.8	50.0	49.7
11:00 - 12:00	50.8	49.1	49.5	48.6	48.1	51.6	50.0
L90(avg)*	49.6	49.8	49.7	49.3	50.0	50.2	51.3

Remark : \* Average time between 12:00-12:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team





## Noise Monitoring Result : Community Noise

### MTR-SPRC PLC-Refinery

Location : Northern Refinery Boundary Station 3

Monitor Period : 16-23 Nov 2023

SLM Model : Cirrus CR162B

Serial No : G302237

Site Operator : Mr. Suphachai Sukmai

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : 20 Dec 2022

SLM Reading / Adjust dB(A) : 93.4/0.3

Expire Date : 19 Dec 2023

Cal Sheet No.: CR-515-2023-229

Time	Equivalent Sound Pressure Level (dB(A))						
	16-17 Nov 2023	17-18 Nov 2023	18-19 Nov 2023	19-20 Nov 2023	20-21 Nov 2023	21-22 Nov 2023	22-23 Nov 2023
11:00 - 12:00	55.2	54.7	54.0	54.6	52.5	52.2	53.2
12:00 - 13:00	54.3	53.0	54.0	54.0	52.0	52.1	55.7
13:00 - 14:00	54.9	52.8	53.5	54.0	52.7	52.6	57.8
14:00 - 15:00	55.3	52.6	53.3	52.8	54.6	52.7	56.8
15:00 - 16:00	54.3	53.1	52.7	53.1	56.5	55.4	56.6
16:00 - 17:00	54.3	54.0	53.5	53.6	56.9	57.5	57.4
17:00 - 18:00	54.9	54.9	54.4	54.7	57.2	57.6	57.1
18:00 - 19:00	55.3	54.7	54.4	54.6	57.7	58.2	57.8
19:00 - 20:00	53.0	55.2	54.6	54.7	55.4	57.7	58.4
20:00 - 21:00	53.3	53.8	55.3	54.7	55.5	55.7	57.2
21:00 - 22:00	54.2	53.9	54.8	55.5	54.6	55.4	56.6
22:00 - 23:00	56.8	54.8	54.9	55.6	54.8	54.7	54.7
23:00 - 00:00	59.1	57.0	56.7	57.1	57.9	56.2	56.4
00:00 - 01:00	60.6	56.0	55.8	54.7	55.3	54.3	55.0
01:00 - 02:00	60.0	55.9	54.7	54.3	55.2	54.2	55.0
02:00 - 03:00	57.5	55.4	54.7	54.3	55.2	54.6	54.2
03:00 - 04:00	56.4	55.0	54.1	54.1	55.1	54.5	54.7
04:00 - 05:00	55.6	55.3	54.9	54.1	55.1	54.4	56.9
05:00 - 06:00	55.5	54.9	54.9	54.4	54.7	54.6	54.9
06:00 - 07:00	54.6	54.7	55.4	55.3	55.4	55.3	55.1
07:00 - 08:00	53.6	55.9	55.8	55.8	55.9	56.0	57.8
08:00 - 09:00	53.4	54.2	54.6	54.1	53.7	53.6	53.6
09:00 - 10:00	53.1	53.8	53.6	52.8	52.9	53.2	52.9
10:00 - 11:00	53.2	54.0	54.7	52.3	52.8	52.7	53.1
Leq(24)*	55.9	54.7	54.6	54.5	55.3	55.2	56.1
Ldn	63.9	61.7	61.5	61.3	61.9	61.3	61.9
Lmax **	74.8	75.1	76.6	74.0	82.1	76.3	78.4
Standard-24Hr	70 dB(A)						
Standard-Max	115 dB(A)						

Remark : \* Average time between 11:00-11:00

\*\* Maximum Sound Pressure Level between 11:00-11:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team





## Noise Monitoring Result : Background Noise

### MTR-SPRC PLC-Refinery

Location : Northern Refinery Boundary Station 3

Monitor Period : 16-23 Nov 2023

SLM Model : Cirrus CR162B

Serial No : G302237

Site Operator : Mr. Suphachai Sukmai

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : 20 Dec 2022

SLM Reading / Adjust dB(A) : 93.4/0.3

Expire Date : 19 Dec 2023

Cal Sheet No.: CR-515-2023-229

Time	L90 (dB(A))						
	16-17 Nov 2023	17-18 Nov 2023	18-19 Nov 2023	19-20 Nov 2023	20-21 Nov 2023	21-22 Nov 2023	22-23 Nov 2023
11:00 - 12:00	52.1	51.5	51.8	52.6	49.5	49.2	50.3
12:00 - 13:00	51.8	50.7	52.0	51.7	49.1	49.0	52.1
13:00 - 14:00	51.9	50.6	51.0	51.2	50.1	49.9	54.7
14:00 - 15:00	51.5	50.6	50.8	50.6	50.5	50.0	54.7
15:00 - 16:00	51.1	50.8	50.5	51.0	54.3	50.6	54.8
16:00 - 17:00	51.8	51.9	51.5	51.0	54.8	55.1	55.5
17:00 - 18:00	51.9	52.6	52.4	52.4	55.6	55.9	55.3
18:00 - 19:00	51.5	52.8	52.3	52.8	56.0	56.5	56.0
19:00 - 20:00	49.2	52.4	52.7	52.8	53.4	56.0	57.2
20:00 - 21:00	49.7	52.2	53.2	52.8	53.1	53.0	55.5
21:00 - 22:00	50.7	52.2	53.2	53.8	52.7	52.4	53.8
22:00 - 23:00	52.5	53.1	53.3	54.2	53.1	52.7	52.7
23:00 - 00:00	54.1	54.1	53.8	54.1	54.1	53.1	53.7
00:00 - 01:00	56.2	54.4	53.6	53.0	53.8	52.6	53.0
01:00 - 02:00	56.2	54.2	53.2	52.6	53.8	52.6	52.7
02:00 - 03:00	52.8	53.8	53.1	52.6	53.2	53.0	52.7
03:00 - 04:00	52.0	53.6	52.6	52.5	53.5	52.8	53.1
04:00 - 05:00	52.0	53.8	53.1	52.4	53.3	52.7	53.0
05:00 - 06:00	52.6	53.4	53.6	52.6	53.0	52.9	53.1
06:00 - 07:00	51.9	53.3	53.9	53.8	53.7	53.5	53.5
07:00 - 08:00	51.4	53.4	53.9	53.4	53.0	53.3	53.6
08:00 - 09:00	51.3	52.2	52.5	52.2	51.1	51.0	51.0
09:00 - 10:00	51.2	51.7	51.8	50.6	50.1	49.8	50.1
10:00 - 11:00	51.4	51.1	52.4	49.6	49.4	49.4	50.2
L90(avg)*	52.4	52.7	52.7	52.5	53.1	52.9	53.8

Remark : \* Average time between 11:00-11:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team



## Noise Monitoring Result : Community Noise

### MTR-SPRC PLC-Refinery

Location : Eastern Refinery Boundary

Monitor Period : 16-23 Nov 2023

SLM Model : Cirrus CR162B

Serial No : G300833

Site Operator : Mr. Suphachai Sukmai

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : 20 Dec 2022

SLM Reading / Adjust dB(A) : 93.7/0.0

Expire Date : 19 Dec 2023

Cal Sheet No.: CR-515-2023-229

Time	Equivalent Sound Pressure Level (dB(A))						
	16-17 Nov 2023	17-18 Nov 2023	18-19 Nov 2023	19-20 Nov 2023	20-21 Nov 2023	21-22 Nov 2023	22-23 Nov 2023
11:00 - 12:00	61.3	60.7	61.0	61.0	59.7	60.8	58.6
12:00 - 13:00	60.1	60.5	61.7	59.3	58.7	58.7	59.6
13:00 - 14:00	61.0	60.2	58.6	60.2	58.8	60.2	59.5
14:00 - 15:00	57.6	59.9	58.4	59.9	59.1	58.2	59.8
15:00 - 16:00	59.0	59.8	60.5	59.0	60.5	59.6	60.1
16:00 - 17:00	64.3	62.9	62.0	64.3	61.8	62.2	62.5
17:00 - 18:00	65.7	65.8	64.2	64.2	64.7	64.5	63.9
18:00 - 19:00	63.5	64.0	63.8	63.8	63.7	63.2	64.3
19:00 - 20:00	64.3	63.0	65.1	64.6	64.6	63.7	64.5
20:00 - 21:00	63.3	63.6	62.7	63.3	63.3	62.8	64.7
21:00 - 22:00	63.3	62.8	62.5	61.5	61.5	62.9	62.6
22:00 - 23:00	62.5	62.0	61.9	58.2	60.8	58.2	59.3
23:00 - 00:00	58.6	61.0	60.4	59.1	57.7	59.1	56.3
00:00 - 01:00	56.3	59.9	58.6	59.0	54.8	59.0	60.4
01:00 - 02:00	54.0	53.7	57.3	53.3	54.6	53.3	55.0
02:00 - 03:00	53.4	57.5	58.3	53.4	57.5	58.1	53.9
03:00 - 04:00	54.2	54.3	55.9	54.2	54.5	54.0	53.2
04:00 - 05:00	56.2	55.4	56.2	55.4	57.2	55.0	56.4
05:00 - 06:00	59.1	57.1	56.9	57.1	59.8	58.4	58.1
06:00 - 07:00	63.5	63.7	63.5	63.7	64.2	64.6	65.3
07:00 - 08:00	67.1	66.5	63.0	63.0	66.5	66.3	66.3
08:00 - 09:00	62.9	62.2	61.1	61.1	61.9	63.0	61.6
09:00 - 10:00	60.3	61.4	60.2	60.3	59.2	60.3	62.6
10:00 - 11:00	58.9	60.2	60.7	62.2	58.8	62.7	59.3
Leq(24)*	61.8	61.8	61.3	61.1	61.3	61.5	61.6
Ldn	66.2	66.6	66.4	65.6	66.1	66.2	66.3
Lmax **	89.1	88.8	88.0	89.1	87.9	87.0	87.4
Standard-24Hr	70 dB(A)						
Standard-Max	115 dB(A)						

Remark : \* Average time between 11:00-11:00

\*\* Maximum Sound Pressure Level between 11:00-11:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team





## Noise Monitoring Result : Background Noise

### MTR-SPRC PLC-Refinery

Location : Eastern Refinery Boundary

Monitor Period : 16-23 Nov 2023

SLM Model : Cirrus CR162B

Serial No : G300833

Site Operator : Mr. Suphachai Sukmai

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : 20 Dec 2022

SLM Reading / Adjust dB(A) : 93.7/0.0

Expire Date : 19 Dec 2023

Cal Sheet No.: CR-515-2023-229

Time	L90 (dB(A))						
	16-17 Nov 2023	17-18 Nov 2023	18-19 Nov 2023	19-20 Nov 2023	20-21 Nov 2023	21-22 Nov 2023	22-23 Nov 2023
11:00 - 12:00	49.5	51.2	50.9	50.2	50.2	48.8	48.8
12:00 - 13:00	49.6	51.1	48.6	49.5	48.7	49.1	49.9
13:00 - 14:00	50.2	49.8	47.1	49.8	46.9	48.2	50.5
14:00 - 15:00	47.0	48.2	47.5	48.2	47.7	46.7	50.1
15:00 - 16:00	49.8	49.6	48.0	49.8	49.7	48.5	50.4
16:00 - 17:00	55.5	53.7	51.7	55.5	53.7	53.4	54.0
17:00 - 18:00	58.0	57.6	54.9	54.9	56.6	57.4	57.4
18:00 - 19:00	55.8	55.5	55.1	55.1	55.5	55.4	55.9
19:00 - 20:00	54.4	53.9	53.4	55.2	55.2	55.0	54.7
20:00 - 21:00	52.2	51.8	51.3	51.9	51.9	51.1	51.5
21:00 - 22:00	49.2	49.5	49.1	49.4	49.4	49.0	49.5
22:00 - 23:00	47.7	48.2	47.9	47.5	47.8	47.5	47.2
23:00 - 00:00	46.0	48.1	48.4	47.3	47.3	47.3	46.6
00:00 - 01:00	45.1	46.6	47.5	46.8	47.0	46.8	46.2
01:00 - 02:00	44.5	46.3	46.7	46.4	46.9	46.4	46.1
02:00 - 03:00	45.1	46.2	46.4	45.1	47.0	46.4	46.8
03:00 - 04:00	44.8	46.2	45.7	44.8	46.5	46.1	46.8
04:00 - 05:00	45.5	46.5	46.2	46.5	47.1	46.5	47.5
05:00 - 06:00	48.9	48.1	47.8	48.1	49.3	48.2	49.2
06:00 - 07:00	55.6	54.0	52.9	54.0	55.9	55.6	55.8
07:00 - 08:00	58.9	57.2	53.9	53.9	58.4	57.8	58.2
08:00 - 09:00	53.8	51.7	50.6	50.6	52.2	52.9	52.4
09:00 - 10:00	50.6	49.8	49.1	49.4	50.5	49.4	49.2
10:00 - 11:00	49.4	49.3	50.2	48.8	48.0	48.1	48.0
L90(avg)*	52.5	51.9	50.6	51.2	52.1	51.9	52.2

Remark : \* Average time between 11:00-11:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team





## Noise Monitoring Result : Community Noise

### MTR-SPRC PLC-Refinery

Location : Southern Refinery Boundary Station 1

Monitor Period : 16-23 Nov 2023

SLM Model : Cirrus CR162B

Serial No : G300846

Site Operator : Mr. Suphachai Sukmai

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : 20 Dec 2022

SLM Reading / Adjust dB(A) : 93.7/0.0

Expire Date : 19 Dec 2023

Cal Sheet No.: CR-515-2023-229

Time	Equivalent Sound Pressure Level (dB(A))						
	16-17 Nov 2023	17-18 Nov 2023	18-19 Nov 2023	19-20 Nov 2023	20-21 Nov 2023	21-22 Nov 2023	22-23 Nov 2023
11:00 - 12:00	55.2	57.1	55.2	55.3	56.6	55.4	54.8
12:00 - 13:00	54.0	56.1	54.8	54.0	53.8	53.6	53.1
13:00 - 14:00	55.8	54.9	53.3	52.2	53.2	53.4	54.0
14:00 - 15:00	54.2	54.3	53.0	53.3	53.4	53.5	52.9
15:00 - 16:00	52.9	56.0	53.8	54.2	51.9	53.3	53.7
16:00 - 17:00	53.3	57.7	55.9	57.2	53.0	57.0	54.0
17:00 - 18:00	54.2	59.7	57.7	57.9	57.2	59.5	56.5
18:00 - 19:00	56.8	58.9	60.9	58.9	58.9	60.6	58.7
19:00 - 20:00	59.0	59.5	59.8	57.2	60.2	58.9	59.5
20:00 - 21:00	60.6	57.9	58.9	57.2	60.3	58.0	59.0
21:00 - 22:00	59.9	56.7	56.3	55.0	57.9	56.6	55.8
22:00 - 23:00	57.6	54.8	56.0	54.4	56.8	55.9	54.8
23:00 - 00:00	56.4	54.0	55.3	54.2	56.2	56.0	54.0
00:00 - 01:00	55.6	53.6	55.2	54.6	56.2	55.6	54.6
01:00 - 02:00	55.5	52.7	53.7	53.8	55.7	55.0	53.9
02:00 - 03:00	54.6	53.2	53.3	54.0	55.4	55.2	53.9
03:00 - 04:00	53.6	53.8	53.3	54.6	55.4	55.1	54.4
04:00 - 05:00	53.4	53.8	53.1	55.2	54.8	56.6	54.9
05:00 - 06:00	53.1	54.6	54.3	56.1	56.5	56.5	54.7
06:00 - 07:00	53.2	55.9	57.9	58.0	58.0	58.2	56.5
07:00 - 08:00	55.3	57.3	59.7	57.1	58.7	58.9	59.4
08:00 - 09:00	58.8	55.7	57.6	56.1	57.2	55.4	59.1
09:00 - 10:00	58.2	55.2	55.6	54.4	55.3	54.0	57.5
10:00 - 11:00	56.9	54.3	55.3	55.2	54.7	53.5	57.0
Leq(24)*	56.4	56.2	56.5	55.7	56.7	56.6	56.2
Ldn	61.8	61.1	61.8	61.7	62.7	62.6	61.5
Lmax **	76.2	82.5	74.8	79.3	77.2	79.7	75.4
Standard-24Hr	70 dB(A)						
Standard-Max	115 dB(A)						

Remark : \* Average time between 11:00-11:00

\*\* Maximum Sound Pressure Level between 11:00-11:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team



## Noise Monitoring Result : Background Noise

### MTR-SPRC PLC-Refinery

Location : Southern Refinery Boundary Station 1

Monitor Period : 16-23 Nov 2023

SLM Model : Cirrus CR162B

Serial No : G300846

Site Operator : Mr. Suphachai Sukmai

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : 20 Dec 2022

SLM Reading / Adjust dB(A) : 93.7/0.0

Expire Date : 19 Dec 2023

Cal Sheet No.: CR-515-2023-229

Time	L90 (dB(A))						
	16-17 Nov 2023	17-18 Nov 2023	18-19 Nov 2023	19-20 Nov 2023	20-21 Nov 2023	21-22 Nov 2023	22-23 Nov 2023
11:00 - 12:00	52.1	53.1	51.9	50.4	52.4	50.0	49.9
12:00 - 13:00	51.6	52.3	51.1	48.3	49.5	49.1	49.1
13:00 - 14:00	52.2	51.3	49.9	47.2	48.7	48.8	49.3
14:00 - 15:00	51.0	50.8	49.4	47.8	50.2	49.1	48.4
15:00 - 16:00	49.2	52.2	50.4	49.1	47.6	48.1	49.4
16:00 - 17:00	49.7	54.0	52.0	51.2	49.5	52.6	51.0
17:00 - 18:00	50.6	54.6	53.7	52.6	53.3	55.0	52.8
18:00 - 19:00	52.5	56.1	56.2	53.5	55.4	56.9	55.0
19:00 - 20:00	54.0	54.7	56.2	53.0	56.1	55.3	55.6
20:00 - 21:00	56.2	53.4	53.3	52.0	54.1	54.2	54.9
21:00 - 22:00	56.1	52.7	52.0	52.0	54.2	53.7	53.0
22:00 - 23:00	52.8	52.6	52.0	52.1	53.0	53.0	52.6
23:00 - 00:00	52.0	51.9	52.5	52.3	53.8	53.5	51.4
00:00 - 01:00	52.0	51.5	52.2	52.2	53.7	53.6	52.7
01:00 - 02:00	52.6	51.3	51.4	52.3	54.0	53.4	52.6
02:00 - 03:00	51.9	51.5	51.3	52.4	53.9	54.0	52.5
03:00 - 04:00	51.4	51.8	51.4	52.8	53.7	54.0	53.1
04:00 - 05:00	51.3	51.9	51.3	53.4	53.0	54.1	53.7
05:00 - 06:00	51.2	52.2	51.8	53.4	53.9	54.6	53.0
06:00 - 07:00	51.4	53.9	53.8	55.6	55.3	56.1	53.8
07:00 - 08:00	52.2	54.9	54.4	54.8	55.4	55.5	55.1
08:00 - 09:00	54.4	52.7	52.6	53.5	52.5	51.9	53.7
09:00 - 10:00	54.0	52.0	51.6	51.8	51.9	49.8	53.6
10:00 - 11:00	52.9	51.9	50.8	51.7	50.7	49.3	52.9
L90(avg)*	52.7	52.9	52.6	52.3	53.2	53.4	52.9

Remark : \* Average time between 11:00-11:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team





## Noise Monitoring Result : Community Noise

### MTR-SPRC PLC-Refinery

Location : Southern Refinery Boundary Station 2

Monitor Period : 16-23 Nov 2023

SLM Model : Cirrus CR162B

Serial No : G301027

Site Operator : Mr. Suphachai Sukmai

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : 20 Dec 2022

SLM Reading / Adjust dB(A) : 93.7/0.0

Expire Date : 19 Dec 2023

Cal Sheet No.: CR-515-2023-229

Time	Equivalent Sound Pressure Level (dB(A))						
	16-17 Nov 2023	17-18 Nov 2023	18-19 Nov 2023	19-20 Nov 2023	20-21 Nov 2023	21-22 Nov 2023	22-23 Nov 2023
11:00 - 12:00	61.3	62.3	60.8	59.4	63.4	60.3	60.3
12:00 - 13:00	60.5	61.3	60.3	58.8	59.6	59.3	61.1
13:00 - 14:00	62.3	60.5	59.3	58.2	58.9	59.1	60.7
14:00 - 15:00	61.4	60.5	59.4	58.5	60.0	60.5	60.6
15:00 - 16:00	60.5	61.0	61.3	59.7	61.0	61.1	61.9
16:00 - 17:00	60.4	62.7	62.8	61.9	63.5	63.7	63.5
17:00 - 18:00	61.0	63.0	62.6	62.2	64.2	63.4	63.5
18:00 - 19:00	62.6	63.1	62.6	61.2	63.5	63.4	63.3
19:00 - 20:00	63.1	62.6	62.8	61.4	63.8	63.8	64.4
20:00 - 21:00	63.0	62.5	62.1	61.5	62.4	63.1	63.9
21:00 - 22:00	62.7	60.4	60.3	59.0	60.0	60.5	60.9
22:00 - 23:00	62.5	62.2	61.2	58.0	58.9	60.1	59.9
23:00 - 00:00	60.5	60.7	60.2	58.0	58.1	59.1	58.2
00:00 - 01:00	62.2	59.3	60.8	58.6	59.3	58.7	58.5
01:00 - 02:00	60.8	58.0	60.1	58.0	62.3	58.1	56.6
02:00 - 03:00	59.3	58.2	59.6	59.3	62.4	57.6	56.1
03:00 - 04:00	58.0	58.9	59.7	59.5	59.9	57.6	57.0
04:00 - 05:00	58.2	58.6	58.6	59.5	58.5	57.7	57.4
05:00 - 06:00	58.9	59.2	58.7	60.2	59.6	61.7	58.6
06:00 - 07:00	58.5	61.8	61.8	62.5	61.7	65.1	61.8
07:00 - 08:00	59.1	63.4	62.7	63.6	63.4	63.8	63.8
08:00 - 09:00	61.5	62.2	61.4	62.1	61.8	62.2	62.4
09:00 - 10:00	61.2	60.2	60.0	60.1	59.7	60.4	60.0
10:00 - 11:00	60.5	59.9	59.1	59.7	59.2	59.7	59.5
Leq(24)*	61.1	61.2	61.0	60.3	61.5	61.4	61.2
Ldn	66.8	66.7	66.8	66.1	67.1	67.0	65.8
Lmax **	83.9	83.9	80.5	80.8	79.4	83.4	85.1
Standard-24Hr	70 dB(A)						
Standard-Max	115 dB(A)						

Remark : \* Average time between 11:00-11:00

\*\* Maximum Sound Pressure Level between 11:00-11:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team





## Noise Monitoring Result : Background Noise

### MTR-SPRC PLC-Refinery

Location : Southern Refinery Boundary Station 2

Monitor Period : 16-23 Nov 2023

SLM Model : Cirrus CR162B

Serial No : G301027

Site Operator : Mr. Suphachai Sukmai

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : 20 Dec 2022

SLM Reading / Adjust dB(A) : 93.7/0.0

Expire Date : 19 Dec 2023

Cal Sheet No.: CR-515-2023-229

Time	L90 (dB(A))						
	16-17 Nov 2023	17-18 Nov 2023	18-19 Nov 2023	19-20 Nov 2023	20-21 Nov 2023	21-22 Nov 2023	22-23 Nov 2023
11:00 - 12:00	58.1	58.0	56.9	56.2	56.9	56.1	55.8
12:00 - 13:00	57.0	57.7	56.3	55.7	55.6	55.5	55.5
13:00 - 14:00	58.2	57.2	55.9	55.1	55.1	55.5	55.9
14:00 - 15:00	57.7	57.0	56.3	55.2	54.7	55.6	55.1
15:00 - 16:00	57.2	57.4	58.5	55.7	55.3	55.9	56.2
16:00 - 17:00	57.0	59.4	59.5	56.9	58.5	58.8	59.1
17:00 - 18:00	57.5	59.1	58.5	57.2	61.1	60.2	60.0
18:00 - 19:00	59.0	59.3	58.6	57.1	59.7	59.3	58.9
19:00 - 20:00	59.3	58.5	58.9	57.0	59.5	58.8	58.5
20:00 - 21:00	59.4	57.7	57.4	56.6	57.7	57.6	56.4
21:00 - 22:00	58.8	57.0	56.8	55.9	56.4	57.0	56.0
22:00 - 23:00	57.7	58.2	58.1	56.0	55.9	56.8	56.0
23:00 - 00:00	57.1	58.0	58.1	56.3	56.0	56.7	55.3
00:00 - 01:00	57.9	56.6	58.4	56.3	56.2	56.4	55.4
01:00 - 02:00	58.5	56.4	57.8	56.4	59.6	56.3	54.7
02:00 - 03:00	56.6	56.7	57.7	57.7	59.8	56.3	54.9
03:00 - 04:00	56.4	57.2	58.1	57.9	57.6	56.2	55.3
04:00 - 05:00	56.7	57.0	56.9	57.9	57.3	55.9	55.8
05:00 - 06:00	57.1	57.2	56.9	58.1	57.9	59.2	56.5
06:00 - 07:00	57.0	58.8	58.2	59.5	58.7	61.8	58.7
07:00 - 08:00	57.2	60.6	58.9	60.8	60.3	61.2	60.5
08:00 - 09:00	58.6	58.8	57.5	58.8	57.5	59.0	58.2
09:00 - 10:00	58.1	57.0	57.3	57.5	56.5	57.3	56.6
10:00 - 11:00	57.0	56.8	56.3	56.9	56.4	56.1	56.1
L90(avg)*	57.8	58.0	57.8	57.3	57.9	57.9	57.1

Remark : \* Average time between 11:00-11:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team



## Noise Monitoring Result : Community Noise

### MTR-SPRC PLC-Refinery

Location : Map Ta Phut New Town

Monitor Period : 16-23 Nov 2023

SLM Model : RION NL-21

Serial No : 00187511

Site Operator : Mr. Suphachai Sukmai

Calibrator Model : RION NC-74

Serial No : 34283648

Calibration Ref dB(A) : 94.0

Certified Date : 13 Jan 2023

SLM Reading / Adjust dB(A) : 93.5/0.5

Expire Date : 12 Jan 2024

Cal Sheet No.: NC-74-2023-052

Time	Equivalent Sound Pressure Level (dB(A))						
	16-17 Nov 2023	17-18 Nov 2023	18-19 Nov 2023	19-20 Nov 2023	20-21 Nov 2023	21-22 Nov 2023	22-23 Nov 2023
15:00 - 16:00	49.7	65.4	65.4	72.8	70.0	68.9	60.9
16:00 - 17:00	64.5	65.4	65.0	72.3	69.6	64.7	68.3
17:00 - 18:00	52.2	62.7	64.2	71.6	68.7	70.3	66.3
18:00 - 19:00	51.0	62.5	54.4	70.9	68.2	69.8	66.7
19:00 - 20:00	49.8	63.0	52.0	70.2	66.6	69.9	69.4
20:00 - 21:00	48.8	63.9	50.5	69.1	66.3	68.6	64.7
21:00 - 22:00	50.3	65.1	49.5	70.6	65.8	66.7	64.4
22:00 - 23:00	57.5	63.9	48.6	66.2	66.1	65.7	62.2
23:00 - 00:00	55.6	58.4	50.2	61.9	65.7	62.6	62.9
00:00 - 01:00	55.6	61.6	58.9	59.5	65.1	58.2	63.7
01:00 - 02:00	56.0	63.3	52.5	58.9	64.8	56.8	63.6
02:00 - 03:00	57.6	61.2	58.2	58.4	64.9	58.7	63.2
03:00 - 04:00	75.2	62.1	48.1	62.9	65.3	57.0	63.2
04:00 - 05:00	67.5	62.7	49.7	62.3	65.8	57.9	63.3
05:00 - 06:00	67.9	61.9	55.2	61.8	65.1	58.2	62.3
06:00 - 07:00	59.5	62.1	56.4	62.7	65.3	58.9	61.9
07:00 - 08:00	62.7	63.4	53.8	64.5	65.9	60.2	62.6
08:00 - 09:00	63.4	64.1	75.1	66.6	68.4	60.8	61.2
09:00 - 10:00	61.4	68.0	66.9	65.3	69.1	58.4	61.6
10:00 - 11:00	67.9	66.2	68.6	67.3	69.7	58.0	62.8
11:00 - 12:00	66.9	67.9	69.8	68.9	69.8	60.1	62.6
12:00 - 13:00	66.3	66.5	70.3	70.2	69.8	58.6	62.2
13:00 - 14:00	69.3	66.4	70.9	70.2	69.6	58.3	62.6
14:00 - 15:00	65.3	69.2	72.0	70.2	70.0	57.4	63.0
Leq(24)*	65.5	64.7	66.4	68.3	67.8	64.6	64.2
Ldn	73.3	69.3	67.3	71.0	72.4	68.2	69.7
Lmax **	99.7	99.7	93.8	87.7	79.0	78.8	94.8
Standard-24Hr	70 dB(A)						
Standard-Max	115 dB(A)						

Remark : \* Average time between 15:00-15:00

\*\* Maximum Sound Pressure Level between 15:00-15:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team





## Noise Monitoring Result : Background Noise

### MTR-SPRC PLC-Refinery

Location : Map Ta Phut New Town

Monitor Period : 16-23 Nov 2023

SLM Model : RION NL-21

Serial No : 00187511

Site Operator : Mr. Suphachai Sukmai

Calibrator Model : RION NC-74

Serial No : 34283648

Calibration Ref dB(A) : 94.0

Certified Date : 13 Jan 2023

SLM Reading / Adjust dB(A) : 93.5/0.5

Expire Date : 12 Jan 2024

Cal Sheet No.: NC-74-2023-052

Time	L90 (dB(A))						
	16-17 Nov 2023	17-18 Nov 2023	18-19 Nov 2023	19-20 Nov 2023	20-21 Nov 2023	21-22 Nov 2023	22-23 Nov 2023
15:00 - 16:00	46.3	62.2	62.6	70.7	69.5	63.0	56.0
16:00 - 17:00	48.9	60.9	61.7	70.2	69.0	60.6	62.1
17:00 - 18:00	48.2	57.1	46.5	69.7	67.8	67.1	62.9
18:00 - 19:00	47.5	56.5	49.7	69.0	67.1	68.4	64.5
19:00 - 20:00	47.2	59.7	47.5	68.4	65.4	68.1	65.6
20:00 - 21:00	46.3	61.9	47.6	67.5	64.9	66.8	62.0
21:00 - 22:00	45.8	63.4	46.8	68.4	64.2	63.7	61.9
22:00 - 23:00	45.6	52.5	46.2	60.4	64.7	60.5	60.2
23:00 - 00:00	45.2	51.2	45.8	56.7	63.9	56.3	60.7
00:00 - 01:00	50.6	52.4	45.5	56.7	63.8	54.6	60.4
01:00 - 02:00	47.0	60.4	45.3	49.4	63.3	54.3	61.9
02:00 - 03:00	47.2	59.2	48.2	47.7	63.5	55.4	61.6
03:00 - 04:00	57.3	58.7	46.9	60.2	63.5	54.8	61.4
04:00 - 05:00	58.9	57.9	46.4	60.1	64.0	55.0	61.2
05:00 - 06:00	60.9	55.8	50.6	59.4	63.5	55.1	60.2
06:00 - 07:00	56.9	57.4	47.1	60.8	63.7	55.7	60.6
07:00 - 08:00	58.5	57.7	47.1	62.6	64.3	56.6	60.5
08:00 - 09:00	59.5	58.4	57.9	65.2	67.3	57.9	59.4
09:00 - 10:00	53.7	63.1	58.4	64.2	68.4	55.1	59.8
10:00 - 11:00	53.8	60.2	66.7	64.8	69.0	55.3	60.4
11:00 - 12:00	64.4	53.9	67.8	66.8	69.2	58.0	60.8
12:00 - 13:00	64.3	63.9	69.0	69.3	68.3	55.2	59.9
13:00 - 14:00	64.8	64.2	69.3	69.6	68.7	55.6	60.7
14:00 - 15:00	62.7	65.2	70.7	69.8	69.4	54.6	60.5
L90(avg)*	58.3	60.4	62.7	66.5	66.7	61.7	61.4

Remark : \* Average time between 15:00-15:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team





## Noise Monitoring Result : Community Noise

### MTR-SPRC PLC-Refinery

Location : Soi Ruam Patana Community

Monitor Period : 16-23 Nov 2023

SLM Model : Cirrus CR162B

Serial No : G302740

Site Operator : Mr. Suphachai Sukmai

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : 20 Dec 2022

SLM Reading / Adjust dB(A) : 93.4/0.3

Expire Date : 19 Dec 2023

Cal Sheet No.: CR-515-2023-229

Time	Equivalent Sound Pressure Level (dB(A))						
	16-17 Nov 2023	17-18 Nov 2023	18-19 Nov 2023	19-20 Nov 2023	20-21 Nov 2023	21-22 Nov 2023	22-23 Nov 2023
14:00 - 15:00	55.4	46.4	60.4	46.7	46.7	46.4	46.0
15:00 - 16:00	49.5	47.9	59.9	48.6	48.1	46.2	46.8
16:00 - 17:00	61.2	61.2	62.1	48.1	62.4	47.4	62.2
17:00 - 18:00	51.1	51.8	58.9	50.7	49.9	49.4	48.9
18:00 - 19:00	52.1	51.1	61.4	50.0	49.9	51.2	50.6
19:00 - 20:00	54.0	51.1	62.1	51.5	49.9	49.9	50.6
20:00 - 21:00	53.0	50.6	62.2	52.2	49.5	53.1	49.0
21:00 - 22:00	48.8	47.2	61.2	49.0	46.3	48.0	47.4
22:00 - 23:00	51.9	46.6	58.6	45.4	45.4	45.4	46.2
23:00 - 00:00	45.9	47.8	56.7	46.0	43.8	45.3	47.2
00:00 - 01:00	45.3	44.5	48.3	43.9	47.6	44.2	46.0
01:00 - 02:00	43.4	47.2	43.9	44.1	43.4	50.2	46.2
02:00 - 03:00	46.7	42.8	43.7	40.2	47.4	43.3	41.6
03:00 - 04:00	45.1	42.8	49.1	42.7	41.3	43.3	44.8
04:00 - 05:00	45.7	46.0	49.8	45.1	44.8	45.9	47.5
05:00 - 06:00	47.3	47.4	45.3	49.7	49.1	48.7	49.4
06:00 - 07:00	52.8	51.2	50.6	52.2	52.5	50.7	51.3
07:00 - 08:00	55.7	51.2	50.8	55.4	54.6	56.1	56.1
08:00 - 09:00	61.6	54.4	50.6	60.4	61.5	61.0	62.1
09:00 - 10:00	48.9	48.5	48.8	47.7	46.2	47.1	48.4
10:00 - 11:00	48.8	47.8	50.9	47.5	46.2	48.9	46.1
11:00 - 12:00	48.0	49.0	48.4	50.3	48.8	47.5	52.0
12:00 - 13:00	60.7	47.3	49.2	61.1	62.4	63.3	62.4
13:00 - 14:00	46.4	50.9	47.1	47.4	46.0	47.5	44.3
Leq(24)*	54.3	51.3	57.2	52.5	54.3	53.4	54.5
Ldn	57.0	54.8	60.6	55.4	56.6	56.0	56.7
Lmax **	78.5	78.0	75.1	77.9	75.9	77.2	78.4
Standard-24Hr	70 dB(A)						
Standard-Max	115 dB(A)						

Remark : \* Average time between 14:00-14:00

\*\* Maximum Sound Pressure Level between 14:00-14:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team



## Noise Monitoring Result : Background Noise

### MTR-SPRC PLC-Refinery

Location : Soi Ruam Patana Community

Monitor Period : 16-23 Nov 2023

SLM Model : Cirrus CR162B

Serial No : G302740

Site Operator : Mr. Suphachai Sukmai

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : 20 Dec 2022

SLM Reading / Adjust dB(A) : 93.4/0.3

Expire Date : 19 Dec 2023

Cal Sheet No.: CR-515-2023-229

Time	L90 (dB(A))						
	16-17 Nov 2023	17-18 Nov 2023	18-19 Nov 2023	19-20 Nov 2023	20-21 Nov 2023	21-22 Nov 2023	22-23 Nov 2023
14:00 - 15:00	39.7	40.4	43.6	39.5	37.7	37.1	39.3
15:00 - 16:00	41.9	41.6	54.8	40.9	41.0	38.3	40.2
16:00 - 17:00	45.4	43.4	58.4	42.5	41.7	41.5	41.3
17:00 - 18:00	46.0	44.3	46.2	43.8	41.9	42.5	43.1
18:00 - 19:00	47.7	45.8	47.0	45.0	42.5	44.4	45.2
19:00 - 20:00	47.6	45.4	56.3	43.9	44.2	44.5	47.0
20:00 - 21:00	46.7	44.8	55.9	42.8	42.5	44.1	43.7
21:00 - 22:00	43.8	43.2	52.0	41.0	41.8	44.1	44.4
22:00 - 23:00	42.5	43.2	47.0	41.0	40.7	42.8	41.7
23:00 - 00:00	41.5	42.8	45.8	41.8	40.9	40.9	41.4
00:00 - 01:00	41.5	42.0	41.4	39.4	40.9	39.6	42.3
01:00 - 02:00	41.0	41.3	40.4	38.7	38.8	39.3	39.9
02:00 - 03:00	40.6	39.8	39.5	36.9	38.3	40.1	37.6
03:00 - 04:00	39.4	39.8	37.3	36.8	37.4	38.3	37.6
04:00 - 05:00	37.9	39.3	37.5	36.2	36.9	37.5	43.6
05:00 - 06:00	39.5	40.6	38.7	39.2	39.0	39.3	41.5
06:00 - 07:00	45.8	44.6	43.8	45.8	45.7	45.7	45.5
07:00 - 08:00	46.4	45.2	44.1	45.0	44.2	44.4	45.5
08:00 - 09:00	46.6	43.5	43.7	43.7	41.5	42.2	43.1
09:00 - 10:00	44.4	42.5	43.4	41.8	40.2	39.3	41.1
10:00 - 11:00	39.7	41.5	42.9	40.6	38.7	38.7	40.1
11:00 - 12:00	38.7	41.6	41.4	39.6	36.2	35.7	38.8
12:00 - 13:00	41.4	39.5	39.3	38.1	37.6	37.7	38.2
13:00 - 14:00	40.2	38.9	38.6	37.5	37.3	39.0	37.2
L90(avg)*	43.8	42.8	49.9	41.7	41.0	41.6	42.5

Remark : \* Average time between 14:00-14:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team





## Noise Monitoring Result : Community Noise

### MTR-SPRC PLC-Refinery

Location : Wat Sophon Community

Monitor Period : 16-23 Nov 2023

SLM Model : Cirrus CR162B

Serial No : G300709

Site Operator : Mr. Suphachai Sukmai

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : 20 Dec 2022

SLM Reading / Adjust dB(A) : 93.4/0.3

Expire Date : 19 Dec 2023

Cal Sheet No.: CR-515-2023-229

Time	Equivalent Sound Pressure Level (dB(A))						
	16-17 Nov 2023	17-18 Nov 2023	18-19 Nov 2023	19-20 Nov 2023	20-21 Nov 2023	21-22 Nov 2023	22-23 Nov 2023
14:00 - 15:00	61.6	53.7	54.1	50.8	52.9	52.1	58.5
15:00 - 16:00	58.4	53.5	50.9	52.1	51.8	54.4	60.2
16:00 - 17:00	60.6	55.7	53.7	55.4	55.1	54.6	60.0
17:00 - 18:00	57.7	55.0	52.5	53.9	64.3	59.7	58.0
18:00 - 19:00	54.3	54.2	55.2	54.6	53.9	56.6	54.8
19:00 - 20:00	55.7	54.8	49.5	52.3	51.6	55.5	56.6
20:00 - 21:00	56.5	52.2	49.0	57.2	48.8	54.8	56.8
21:00 - 22:00	56.9	52.2	49.9	50.0	49.1	52.6	57.3
22:00 - 23:00	54.1	51.1	47.2	49.2	48.1	52.4	54.7
23:00 - 00:00	52.3	46.9	48.3	48.3	46.6	52.2	52.4
00:00 - 01:00	51.4	47.6	48.8	49.2	45.0	52.1	52.1
01:00 - 02:00	55.7	46.9	41.7	45.1	43.3	51.4	56.0
02:00 - 03:00	51.0	47.4	41.7	43.7	41.8	51.2	51.4
03:00 - 04:00	51.1	47.8	44.9	45.1	43.2	51.2	51.6
04:00 - 05:00	51.5	51.1	49.7	49.9	49.3	51.4	51.9
05:00 - 06:00	52.0	56.9	55.1	55.4	57.1	52.9	52.6
06:00 - 07:00	53.3	65.4	64.2	53.3	64.2	53.6	53.8
07:00 - 08:00	54.4	56.4	63.4	55.4	63.7	56.1	55.0
08:00 - 09:00	57.3	54.5	52.1	54.8	53.3	54.7	59.9
09:00 - 10:00	73.1	51.2	52.6	51.3	50.0	67.2	73.6
10:00 - 11:00	68.7	52.0	51.6	50.9	52.0	59.8	69.4
11:00 - 12:00	69.3	53.5	61.1	52.7	54.5	53.6	69.2
12:00 - 13:00	55.0	53.9	54.2	54.4	54.2	55.0	67.4
13:00 - 14:00	53.5	52.1	51.5	51.5	52.5	58.3	58.1
Leq(24)*	62.7	55.3	55.8	52.7	56.6	57.2	63.6
Ldn	64.0	63.1	62.1	57.4	62.4	60.3	64.7
Lmax **	95.4	79.7	85.1	86.5	80.8	83.7	95.7
Standard-24Hr	70 dB(A)						
Standard-Max	115 dB(A)						

Remark : \* Average time between 14:00-14:00

\*\* Maximum Sound Pressure Level between 14:00-14:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team





## Noise Monitoring Result : Background Noise

### MTR-SPRC PLC-Refinery

Location : Wat Sophon Community

Monitor Period : 16-23 Nov 2023

SLM Model : Cirrus CR162B

Serial No : G300709

Site Operator : Mr. Suphachai Sukmai

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : 20 Dec 2022

SLM Reading / Adjust dB(A) : 93.4/0.3

Expire Date : 19 Dec 2023

Cal Sheet No.: CR-515-2023-229

Time	L90 (dB(A))						
	16-17 Nov 2023	17-18 Nov 2023	18-19 Nov 2023	19-20 Nov 2023	20-21 Nov 2023	21-22 Nov 2023	22-23 Nov 2023
14:00 - 15:00	52.0	45.9	44.6	45.1	45.2	44.7	53.6
15:00 - 16:00	52.5	45.9	44.7	44.9	45.5	45.7	53.0
16:00 - 17:00	54.4	48.3	46.3	48.0	46.9	47.0	55.2
17:00 - 18:00	52.3	48.2	47.0	47.8	52.7	49.0	52.7
18:00 - 19:00	51.3	47.0	45.2	47.5	48.2	52.1	52.0
19:00 - 20:00	51.1	46.1	44.3	45.9	46.0	51.9	51.8
20:00 - 21:00	51.3	45.4	42.6	46.0	43.7	51.6	51.9
21:00 - 22:00	51.6	44.1	42.7	44.9	43.0	51.5	52.1
22:00 - 23:00	51.0	44.2	41.8	44.1	42.9	51.6	51.6
23:00 - 00:00	50.7	42.0	41.4	43.9	40.6	51.5	51.2
00:00 - 01:00	50.5	41.8	41.7	44.0	40.0	51.2	51.0
01:00 - 02:00	50.5	41.7	38.8	40.7	39.3	50.9	51.0
02:00 - 03:00	50.3	41.3	39.3	40.1	38.9	50.7	50.9
03:00 - 04:00	50.4	41.4	39.7	40.0	39.4	50.7	51.0
04:00 - 05:00	50.6	41.8	40.5	40.7	39.5	50.9	51.1
05:00 - 06:00	50.9	43.0	41.9	42.1	41.4	51.2	51.4
06:00 - 07:00	51.8	57.8	56.6	46.4	56.7	52.4	52.3
07:00 - 08:00	52.3	49.1	54.2	48.1	54.8	53.0	52.8
08:00 - 09:00	51.6	47.3	45.3	46.9	46.2	52.4	52.1
09:00 - 10:00	59.6	45.4	45.5	44.2	44.2	55.6	60.0
10:00 - 11:00	56.5	46.6	44.6	45.5	45.0	52.0	56.6
11:00 - 12:00	53.1	49.0	54.2	46.1	47.1	52.0	53.2
12:00 - 13:00	52.9	52.1	50.8	45.9	46.7	52.4	52.5
13:00 - 14:00	47.4	44.0	45.2	46.3	45.2	52.2	52.1
L90(avg)*	52.8	48.2	48.2	45.4	48.1	51.5	53.3

Remark : \* Average time between 14:00-14:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team

## ใบรับรองผลการตรวจวัดทรัพยากรทางน้ำ



สถานีวิจัยประมงศรีราชา  
101/12 หมู่ 9 ต.บางพระ  
อ.ศรีราชา จ.ชลบุรี 20110  
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รายงานผลการวิเคราะห์แพลงก์ตอนพืชและแพลงก์ตอนสัตว์  
ตาราง ผลการวิเคราะห์แพลงก์ตอนพืชและแพลงก์ตอนสัตว์ (เก็บตัวอย่างวันที่ 10 สิงหาคม 2566)

กลุ่ม/สกุลของแพลงก์ตอน	ปริมาณแพลงก์ตอน (หน่วยต่อลูกบาศก์เมตร)			
	S1	S2	S3	S4
<b>แพลงก์ตอนพืช</b>				
<b>Division Cyanophyta</b>				
<b>Class Cyanophyceae</b>				
<b>Order Nostocales</b>				
<b>Family Oscillatoriaceae</b>				
<i>Oscillatoria prolifica</i>	-	9,000	-	27,000
<i>Oscillatoria</i> sp.	-	-	16,000	27,000
<i>Oscillatoria tenuis</i>	79,000	140,000	32,000	9,000
<b>Family Nostocaceae</b>				
<i>Pseudanabaena</i> sp.	26,000	61,000	8,000	-
<b>Division Chlorophyta</b>				
<b>Class Euglenophyceae</b>				
<b>Order Euglenales</b>				
<b>Family Euglenaceae</b>				
<i>Euglena oxyuris</i>	-	-	16,000	9,000



**ตาราง ผลการวิเคราะห์แพลงก์ตอนพืชและแพลงก์ตอนสัตว์ (เก็บตัวอย่างวันที่ 10 สิงหาคม 2566)**  
(ต่อ)

กลุ่ม/สกุลของแพลงก์ตอน	ปริมาณแพลงก์ตอน (หน่วยต่อลูกบาศก์เมตร)			
	S1	S2	S3	S4
<b>Division Chromophyta</b>				
<b>Class Bacillariophyceae</b>				
<b>Order Biddulphales</b>				
<b>Suborder Coscinodiscineae</b>				
<b>Family Thalassiosiraceae</b>				
<i>Cyclotella striata</i>	466,000	114,000	729,000	125,000
<i>Lauderia annulata</i>	880,000	3,500,000	130,000	627,000
<i>Planktoniella blanda</i>	-	9,000	-	125,000
<i>Thalassiosira eccentrica</i>	141,000	61,000	41,000	-
<i>Thalassiosira rotula</i>	26,000	70,000	-	-
<i>Thalassiosira</i> sp.	-	-	122,000	-
<b>Family Melosiraceae</b>				
<i>Paralia sulcata</i>	26,000	9,000	113,000	54,000
<b>Family Leptocylindraceae</b>				
<i>Corethron criophilum</i>	176,000	105,000	41,000	36,000
<b>Family Coscinodiscaceae</b>				
<i>Coscinodiscus concinnus</i>	9,000	61,000	-	-
<i>Coscinodiscus gigas</i>	62,000	53,000	24,000	27,000
<i>Coscinodiscus radiatus</i>	70,000	35,000	24,000	134,000
<i>Coscinodiscus</i> sp.	88,000	26,000	-	-
<i>Coscinodiscus wailesii</i>	-	9,000	-	-
<i>Palmeria hardmaniana</i>	-	44,000	24,000	18,000
<b>Family Asterolampraceae</b>				
<i>Asterolampra marylandica</i>	18,000	70,000	24,000	27,000
<b>Family Heliopeltaceae</b>				
<i>Actinoptychus grundleri</i>	97,000	105,000	65,000	-

**ตาราง ผลการวิเคราะห์แพลงก์ตอนพืชและแพลงก์ตอนสัตว์ (เก็บตัวอย่างวันที่ 10 สิงหาคม 2566)**  
(ต่อ)

กลุ่ม/สกุลของแพลงก์ตอน	ปริมาณแพลงก์ตอน (หน่วยต่อลูกบาศก์เมตร)			
	S1	S2	S3	S4
<b>Suborder Rhizosoleniineae</b>				
<b>Family Rhizosoleniaceae</b>				
<i>Dactylosolen antarcticus</i>	44,000	114,000	-	45,000
<i>Guinardia delicatula</i>	-	26,000	-	27,000
<i>Guinardia flaccida</i>	968,000	508,000	186,000	895,000
<i>Guinardia striata</i>	2,816,000	2,275,000	1,053,000	394,000
<i>Proboscia alata</i>	1,760,000	3,850,000	518,000	4,296,000
<i>Pseudosolenia calcar-avis</i>	414,000	131,000	24,000	215,000
<i>Rhizosolenia acuminata</i>	26,000	350,000	32,000	81,000
<i>Rhizosolenia imbricata</i>	616,000	700,000	41,000	1,969,000
<i>Rhizosolenia pungens</i>	2,112,000	280,000	429,000	143,000
<i>Rhizosolenia robusta</i>	9,000	-	-	36,000
<i>Rhizosolenia setigera</i>	1,936,000	245,000	227,000	179,000
<i>Rhizosolenia</i> sp.	106,000	53,000	-	-
<i>Rhizosolenia striata</i>	2,288,000	525,000	227,000	2,506,000
<i>Rhizosolenia styliformis</i>	9,000	9,000	-	18,000
<b>Suborder Biddulphiineae</b>				
<b>Family Hemiaulaceae</b>				
<i>Cerataulina bicornis</i>	2,464,000	3,675,000	1,944,000	2,551,000
<i>Cerataulina pelagica</i>	3,344,000	2,975,000	2,592,000	716,000
<i>Climacodium frauenfeldianum</i>	352,000	613,000	-	465,000
<i>Hemiaulus hauckii</i>	792,000	184,000	567,000	161,000
<i>Hemiaulus indicus</i>	1,408,000	201,000	97,000	45,000
<b>Family Chaetoceraceae</b>				
<i>Bacteriastrum delicatulum</i>	18,000	88,000	-	-
<i>Bacteriastrum elongatum</i>	9,000	-	-	9,000

**ตาราง ผลการวิเคราะห์แพลงก์ตอนพืชและแพลงก์ตอนสัตว์ (เก็บตัวอย่างวันที่ 10 สิงหาคม 2566)**

(ต่อ)

กลุ่ม/สกุลของแพลงก์ตอน	ปริมาณแพลงก์ตอน (หน่วยต่อลูกบาศก์เมตร)			
	S1	S2	S3	S4
<i>Bacteriastrum furcatum</i>	18,000	44,000	-	-
<i>Bacteriastrum</i> sp.	62,000	18,000	-	-
<i>Chaetoceros affinis</i>	-	18,000	-	-
<i>Chaetoceros borealis</i>	-	-	24,000	18,000
<i>Chaetoceros compressus</i>	26,000	35,000	32,000	45,000
<i>Chaetoceros costatus</i>	-	-	-	9,000
<i>Chaetoceros curvisetus</i>	308,000	79,000	24,000	98,000
<i>Chaetoceros debilis</i>	-	18,000	16,000	-
<i>Chaetoceros diadema</i>	9,000	-	8,000	18,000
<i>Chaetoceros didymus</i>	26,000	61,000	-	36,000
<i>Chaetoceros diversus</i>	282,000	-	32,000	9,000
<i>Chaetoceros lauderi</i>	26,000	26,000	-	-
<i>Chaetoceros lorenzianus</i>	35,000	44,000	41,000	-
<i>Chaetoceros mitra</i>	18,000	-	-	18,000
<i>Chaetoceros peruvianus</i>	211,000	70,000	32,000	72,000
<i>Chaetoceros pseudocurvisetus</i>	18,000	-	24,000	54,000
<i>Chaetoceros radicans</i>	26,000	-	-	-
<i>Chaetoceros</i> sp.	1,768,000	700,000	729,000	63,000
<i>Chaetoceros teres</i>	9,000	-	-	-
<b>Family Lithodesmaceae</b>				
<i>Ditylum brightwellii</i>	35,000	-	-	-
<i>Ditylum sol</i>	-	9,000	-	18,000
<i>Helicotheca tamesis</i>	493,000	44,000	24,000	-
<b>Family Eupodiscaceae</b>				
<i>Odontella aurita</i>	150,000	-	57,000	36,000
<i>Odontella mobiliensis</i>	528,000	481,000	122,000	36,000
<i>Odontella sinensis</i>	26,000	245,000	49,000	45,000



**ตาราง ผลการวิเคราะห์แพลงก์ตอนพืชและแพลงก์ตอนสัตว์ (เก็บตัวอย่างวันที่ 10 สิงหาคม 2566)**

(ต่อ)

กลุ่ม/สกุลของแพลงก์ตอน	ปริมาณแพลงก์ตอน (หน่วยต่อลูกบาศก์เมตร)			
	S1	S2	S3	S4
<i>Odontella</i> sp.	35,000	-	-	-
<i>Triceratium favus</i>	-	35,000	-	-
<b>Order Bacillariales</b>				
<b>Suborder Fragilariineae</b>				
<b>Family Fragilariaceae</b>				
<i>Synedra ulna</i>	-	-	8,000	18,000
<b>Family Thalassionemataceae</b>				
<i>Thalassionema frauenfeldii</i>	422,000	193,000	235,000	116,000
<i>Thalassionema nitzschioides</i>	1,478,000	788,000	486,000	63,000
<b>Family Licmophoriaceae</b>				
<i>Licmophora paradoxa</i>	-	-	-	54,000
<b>Family Striatella</b>				
<i>Striatella unipunctata</i>	1,356,000	289,000	1,620,000	-
<b>Suborder Bacillariineae</b>				
<b>Family Cymbellaceae</b>				
<i>Anomoeoneis serians</i>	-	-	-	18,000
<b>Family Naviculaceae</b>				
<i>Amphora exigua</i>	-	-	-	9,000
<i>Amphora robusta</i>	26,000	9,000	-	36,000
<i>Amphora</i> sp.	-	26,000	32,000	27,000
<i>Diploneis smithii</i>	-	-	-	9,000
<i>Haslea tromphii</i>	-	18,000	-	81,000
<i>Haslea wawriake</i>	-	-	-	152,000
<i>Meuniera membranacea</i>	35,000	79,000	57,000	107,000
<i>Navicula</i> sp.	18,000	-	-	54,000
<i>Pleurosigma aestuarii</i>	-	-	-	27,000

**ตาราง** ผลการวิเคราะห์แพลงก์ตอนพืชและแพลงก์ตอนสัตว์ (เก็บตัวอย่างวันที่ 10 สิงหาคม 2566)

(ต่อ)

กลุ่ม/สกุลของแพลงก์ตอน	ปริมาณแพลงก์ตอน (หน่วยต่อลูกบาศก์เมตร)			
	S1	S2	S3	S4
<i>Pleurosigma angulatum</i>	176,000	175,000	49,000	170,000
<i>Pleurosigma elongatum</i>	9,000	26,000	-	72,000
<i>Pleurosigma narmanii</i>	194,000	131,000	16,000	27,000
<i>Pleurosigma</i> sp.	-	-	32,000	-
<i>Trachyneis</i> sp.	70,000	70,000	-	161,000
<b>Family Bacillariaceae</b>				
<i>Bacillaria paxillifer</i>	572,000	88,000	113,000	537,000
<i>Cylindrotheca closterium</i>	642,000	210,000	3,564,000	161,000
<i>Nitzschia lorenziana</i>	79,000	26,000	405,000	152,000
<i>Nitzschia</i> sp.	44,000	-	-	-
<i>Pseudo-nitzschia heimii</i>	202,000	61,000	65,000	90,000
<i>Pseudo-nitzschia</i> sp.	194,000	140,000	259,000	45,000
<i>Tryblionella victorieae</i>	9,000	-	-	63,000
<b>Family Surirellaceae</b>				
<i>Entomoneis alata</i>	-	-	8,000	18,000
<i>Entomoneis robusta</i>	150,000	26,000	-	-
<b>Class Dictyochophyceae</b>				
<b>Order Dictyochales</b>				
<b>Family Dictyochophyceae</b>				
<i>Dictyocha fibula</i>	62,000	44,000	-	-
<b>Class Dinophyceae</b>				
<b>Order Gonyaulacalea</b>				
<b>Family Ceratiaceae</b>				
<i>Ceratium furca</i>	-	-	-	27,000
<i>Ceratium fusus</i>	-	9,000	8,000	-
<i>Ceratium macroceros</i>	-	9,000	-	9,000

**ตาราง ผลการวิเคราะห์แพลงก์ตอนพืชและแพลงก์ตอนสัตว์ (เก็บตัวอย่างวันที่ 10 สิงหาคม 2566)**

(ต่อ)

กลุ่ม/สกุลของแพลงก์ตอน	ปริมาณแพลงก์ตอน (หน่วยต่อลูกบาศก์เมตร)			
	S1	S2	S3	S4
<i>Ceratium porrectum</i>	-	18,000	-	-
<b>Family Gonyaulacaceae</b>				
<i>Gonyaulax</i> sp.	-	-	-	9,000
<b>Order Peridiniales</b>				
<b>Family Peridiniaceae</b>				
<i>Peridinium quinquecorne</i>	18,000	-	-	-
<b>Family Protoperidiniaceae</b>				
<i>Protoperidinium conicum</i>	-	35,000	32,000	-
<i>Protoperidinium curtipes</i>	88,000	61,000	16,000	45,000
<i>Protoperidinium pellucidum</i>	-	18,000	-	-
<i>Protoperidinium punctulatum</i>	-	-	-	9,000
<i>Prptoperidinium depressum</i>	-	18,000	-	9,000
<b>แพลงก์ตอนสัตว์</b>				
<b>Phylum Protozoa</b>				
<b>Subphylum Ciliophora</b>				
<b>Class Ciliata</b>				
<b>Subclass Spirotricha</b>				
<b>Order Tintinnida</b>				
<b>Family Tintinnididae</b>				
<i>Leprotintinnus nordquisti</i>	-	9,000	-	-
<b>Family Codonellidae</b>				
<i>Tintinnopsis beroidea</i>	9,000	79,000	32,000	18,000
<i>Tintinnopsis gracilis</i>	-	-	-	9,000
<i>Tintinnopsis loricata</i>	62,000	9,000	32,000	9,000
<i>Tintinnopsis mortensii</i>	-	-	8,000	-
<i>Tintinnopsis radix</i>	-	-	8,000	-



**ตาราง ผลการวิเคราะห์แพลงก์ตอนพืชและแพลงก์ตอนสัตว์ (เก็บตัวอย่างวันที่ 10 สิงหาคม 2566)**  
(ต่อ)

กลุ่ม/สกุลของแพลงก์ตอน	ปริมาณแพลงก์ตอน (หน่วยต่อลูกบาศก์เมตร)			
	S1	S2	S3	S4
<i>Tintinnopsis</i> sp.	9,000	-	-	-
<i>Tintinnopsis tocaninensis</i>	-	44,000	16,000	-
<b>Family Codonellopsidae</b>				
<i>Codonellopsis ostenfeldi</i>	-	-	16,000	9,000
<i>Stenosemella nivalis</i>	-	18,000	8,000	56,000
<b>Family Petalotrichidae</b>				
<i>Metacylis mereschkowskii</i>	9,000	18,000	-	-
<b>Family Rhabdonellidae</b>				
<i>Rhabdonella poculum</i>	-	-	-	9,000
<b>Family Tintinnidae</b>				
<i>Amphorella infundibutum</i>	-	9,000	8,000	-
<i>Eutintinnus colligatus</i>	-	-	-	9,000
<b>Subclass Peritricha</b>				
<b>Order Peritrichida</b>				
<i>Vorticella</i> sp.	18,000	-	-	63,000
<b>Phylum Rotifera</b>				
<b>Class Monogononta</b>				
<b>Order Ploima</b>				
<b>Family Tricercidae</b>				
<i>Trichocerca pusilla</i>	-	-	-	9,000
<b>Phylum Arthropoda</b>				
<b>Class Crustacea</b>				
<b>Subclass Copepoda</b>				
Copepod nauplii	308,000	158,000	154,000	152,000
<b>Order Calanoida</b>				
Calanoid copepod	9,000	-	-	18,000

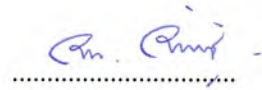
**ตาราง ผลการวิเคราะห์แพลงก์ตอนพืชและแพลงก์ตอนสัตว์ (เก็บตัวอย่างวันที่ 10 สิงหาคม 2566)**  
(ต่อ)

กลุ่ม/สกุลของแพลงก์ตอน	ปริมาณแพลงก์ตอน (หน่วยต่อลูกบาศก์เมตร)			
	S1	S2	S3	S4
<b>Order Harpacticoida</b>				
<b>Family Ectinosomidae</b>				
<i>Microsetella norvegica</i>	-	-	-	9,000
<b>Phylum Mollusca</b>				
<b>Class Bivalvia</b>				
Pelecypod larvae	9,000	26,000	-	18,000
<b>Phylum Chordata</b>				
<b>Subphylum Urochordata</b>				
<b>Class Larvacea</b>				
<b>Family Oikopleuridae</b>				
<i>Oikopleura</i> sp.	62,000	53,000	8,000	9,000
ชนิดของแพลงก์ตอนพืช	76	78	60	78
ชนิดของแพลงก์ตอนสัตว์	9	10	10	14
ชนิดแพลงก์ตอนรวม	85	88	70	92
ปริมาณแพลงก์ตอนพืช	33,608,000	25,777,000	17,565,000	18,946,000
ปริมาณแพลงก์ตอนสัตว์	495,000	423,000	290,000	397,000
ปริมาณแพลงก์ตอนรวม	34,103,000	26,200,000	17,855,000	19,343,000
ค่าดัชนีความหลากหลายแพลงก์ตอนพืช	3.3408	3.0002	2.8638	2.9039
ค่าดัชนีความหลากหลายแพลงก์ตอนสัตว์	1.3004	1.8628	1.6375	2.0435
ค่าดัชนีความสม่ำเสมอแพลงก์ตอนพืช	0.7714	0.6886	0.6995	0.6665
ค่าดัชนีความสม่ำเสมอแพลงก์ตอนสัตว์	0.5918	0.8090	0.7112	0.7743

- หมายเหตุ :
1. สถานี S1 : เกาะสะเก็ด
  2. สถานี S2 : หาดทรายทอง
  3. สถานี S3 : จุดระบายน้ำทิ้งของโรงกลั่นน้ำมันลงทะเล
  4. สถานี S4 : ทะเลเปิด



(นางสาวกนกวรรณ ขาวค้อน)  
ผู้วิเคราะห์



(นายอลงกต อินทรชาติ)  
หัวหน้าสถานีวิจัยประมงศรีราชา





สถานีวิจัยประมงศรีราชา

101/12 หมู่ 9 ต. บางพระ

อ. ศรีราชา จ. ชลบุรี 20110

โทร./โทรสาร. (038) 311379

รายงานผลการวิเคราะห์สัตว์หน้าดิน

ตาราง ผลการวิเคราะห์สัตว์หน้าดิน (เก็บตัวอย่างวันที่ 10 สิงหาคม 2566)

ชนิดสัตว์หน้าดิน	ปริมาณสัตว์หน้าดิน (ตัวต่อตารางเมตร)			
	S1	S2	S3	S4
<b>Phylum Annelida</b>				
<b>Class Polychaeta</b>				
<b>Order Opheliida</b>				
<b>Family Opheliidae</b>				
<i>Armandia</i> sp. (ไส้เดือนทะเล)	-	15	163	-
<b>Order Orbiniida</b>				
<b>Family Orbiniidae</b>				
<i>Scoloplos</i> sp. (ไส้เดือนทะเล)	15	30	-	163
<b>Order Phyllodocida</b>				
<b>Family Glyceridae</b>				
<i>Glycera</i> sp. (ไส้เดือนทะเล)	30	-	-	-
<b>Family Nereididae</b>				
<i>Nereis</i> sp. (แม่เพรียง)	-	-	-	30
<b>Phylum Arthropoda</b>				
<b>Class Malacostraca</b>				
<b>Order Decapoda</b>				
<b>Family Diogenidae</b>				
<i>Diogenes</i> sp. (ปูเสฉวน)	15	-	-	-

**ตาราง ผลการวิเคราะห์สัตว์หน้าดิน** (เก็บตัวอย่างวันที่ 10 สิงหาคม 2566)(ต่อ)

ชนิดสัตว์หน้าดิน	ปริมาณสัตว์หน้าดิน (ตัวต่อตารางเมตร)			
	S1	S2	S3	S4
<b>Phylum Mollusca</b>				
<b>Class Gastropoda</b>				
<b>Order Neogastropoda</b>				
<b>Family Nassariidae</b>				
<i>Nassarius</i> sp. (หอยปากกระเจาด)	30	-	-	-
<b>Class Bivalvia</b>				
<b>Order Cardiida</b>				
<b>Family Donacidae</b>				
<i>Donax</i> sp. (หอยเสียบ)	15	-	-	-
<b>Family Tellinidae</b>				
<i>Tellina</i> sp. (หอยสองฝาชนิดหนึ่ง)	-	-	119	15
<b>Order Venerida</b>				
<b>Family Mactridae</b>				
<i>Mactra</i> sp. (หอยสองฝาชนิดหนึ่ง)	45	-	-	-
<b>Phylum Chordata</b>				
<b>Class Leptocardii</b>				
<b>Order Amphioxiformes</b>				
<b>Family Branchiostomidae</b>				
<i>Branchiostoma</i> sp. (แอมฟิออกซัส)	30	-	-	60
<b>ชนิดสัตว์หน้าดิน</b>	<b>7</b>	<b>2</b>	<b>2</b>	<b>4</b>
<b>ปริมาณสัตว์หน้าดิน</b>	<b>180</b>	<b>45</b>	<b>282</b>	<b>268</b>
<b>ค่าดัชนีความหลากหลายสัตว์หน้าดิน</b>	<b>1.8637</b>	<b>0.6365</b>	<b>0.6809</b>	<b>1.0440</b>

หมายเหตุ : 1. สถานี S1 : เกาะสะเก็ด

2. สถานี S2 : หาดทรายทอง

4. สถานี S4 : ทะเลเปิด

(นายอรรถวุฒิ กันทะวงศ์)

(นายอรรถวุฒิ กันทะวงศ์)  
ผู้วิเคราะห์

(นายอลงกต อินทราชาติ)

(นายอลงกต อินทราชาติ)

หัวหน้าสถานีวิจัยประมงศรีราชา





สถานีวิจัยประมงศรีราชา  
101/12 หมู่ 9 ต.บางพระ  
อ.ศรีราชา จ.ชลบุรี 20110  
โทร./โทรสาร. (038) 311379

รายงานผลการวิเคราะห์แพลงก์ตอนพืชและแพลงก์ตอนสัตว์  
ตาราง ผลการวิเคราะห์แพลงก์ตอนพืชและแพลงก์ตอนสัตว์ (เก็บตัวอย่างวันที่ 4 ธันวาคม 2566)

กลุ่ม/สกุลของแพลงก์ตอน	ปริมาณแพลงก์ตอน (หน่วยต่อลูกบาศก์เมตร)			
	S1	S2	S3	S4
<b>แพลงก์ตอนพืช</b>				
<b>Division Cyanophyta</b>				
<b>Class Cyanophyceae</b>				
<b>Order Nostocales</b>				
<b>Family Oscillatoriaceae</b>				
<i>Lyngbya</i> sp.	-	-	-	93,000
<i>Oscillatoria</i> sp.	-	-	9,000	13,000
<i>Oscillatoria tenuis</i>	31,000	6,000	-	186,000
<b>Family Nostocaceae</b>				
<i>Pseudanabaena</i> sp.	74,000	55,000	-	47,000
<b>Division Chlorophyta</b>				
<b>Class Chlorophyceae</b>				
<b>Order Chlorococcales</b>				
<b>Family Scenedesmaceae</b>				
<i>Scenedesmus opoliensis</i>	-	-	9,000	-
<b>Order Zygnematales</b>				
<b>Family Desmidiaceae</b>				
<i>Cosmarium nudum</i>	-	-	9,000	-
<i>Staurastrum manfeldtii</i>	-	-	9,000	-

**ตาราง ผลการวิเคราะห์แพลงก์ตอนพืชและแพลงก์ตอนสัตว์ (เก็บตัวอย่างวันที่ 4 ธันวาคม 2566)**

(ต่อ)

กลุ่ม/สกุลของแพลงก์ตอน	ปริมาณแพลงก์ตอน (หน่วยต่อลูกบาศก์เมตร)			
	S1	S2	S3	S4
<b>Class Euglenophyceae</b>				
<b>Order Euglenales</b>				
<b>Family Euglenaceae</b>				
<i>Euglena</i> sp.	-	-	26,000	-
<b>Division Chromophyta</b>				
<b>Class Bacillariophyceae</b>				
<b>Order Biddulphales</b>				
<b>Suborder Coscinodiscineae</b>				
<b>Family Thalassiosiraceae</b>				
<i>Cyclotella striata</i>	143,000	646,000	60,000	100,000
<i>Lauderia annulata</i>	31,000	49,000	-	113,000
<i>Planktoniella blanda</i>	-	-	9,000	-
<i>Thalassiosira eccentrica</i>	-	92,000	9,000	33,000
<i>Thalassiosira pacifica</i>	-	18,000	9,000	67,000
<b>Family Melosiraceae</b>				
<i>Melosira dubia</i>	-	-	9,000	-
<i>Paralia sulcata</i>	-	12,000	-	20,000
<b>Family Coscinodiscaceae</b>				
<i>Coscinodiscus concinnus</i>	-	6,000	9,000	-
<i>Coscinodiscus granii</i>	-	43,000	-	33,000
<i>Coscinodiscus radiatus</i>	-	6,000	-	27,000
<i>Coscinodiscus</i> sp.	6,000	-	-	-
<i>Coscinodiscus wailesii</i>	-	6,000	-	7,000
<i>Palmeria hardmaniana</i>	-	-	-	13,000
<b>Family Asterolampraceae</b>				
<i>Asterolampra marylandica</i>	-	-	-	13,000
<i>Asteromphalus flabellatus</i>	-	-	-	7,000

**ตาราง ผลการวิเคราะห์แพลงก์ตอนพืชและแพลงก์ตอนสัตว์ (เก็บตัวอย่างวันที่ 4 ธันวาคม 2566)**

(ต่อ)

กลุ่ม/สกุลของแพลงก์ตอน	ปริมาณแพลงก์ตอน (หน่วยต่อลูกบาศก์เมตร)			
	S1	S2	S3	S4
<b>Family Heliopeltaceae</b>				
<i>Actinoptychus grundleri</i>	-	80,000	-	27,000
<b>Suborder Rhizosoleniineae</b>				
<b>Family Rhizosoleniaceae</b>				
<i>Dactyliosolen antarcticus</i>	6,000	12,000	-	13,000
<i>Dactyliosolen fragillissima</i>	-	-	-	67,000
<i>Guinardia flaccida</i>	25,000	49,000	-	120,000
<i>Guinardia striata</i>	6,000	98,000	-	67,000
<i>Proboscia alata</i>	12,000	25,000	-	40,000
<i>Pseudosolenia calcar-avis</i>	-	-	-	7,000
<i>Rhizosolenia formosa</i>	6,000	-	-	-
<i>Rhizosolenia imbricata</i>	-	-	-	20,000
<i>Rhizosolenia robusta</i>	50,000	-	-	67,000
<i>Rhizosolenia setigera</i>	149,000	615,000	-	-
<i>Rhizosolenia striata</i>	-	-	-	7,000
<b>Suborder Biddulphiineae</b>				
<b>Family Hemiaulaceae</b>				
<i>Cerataulina bicornis</i>	6,000	18,000	-	20,000
<i>Cerataulina pelagica</i>	19,000	461,000	26,000	53,000
<i>Climacodium frauenfeldianum</i>	-	-	-	47,000
<i>Eucampia zodiacus</i>	-	-	-	60,000
<i>Hemiaulus hauckii</i>	-	18,000	-	-
<i>Hemiaulus indicus</i>	6,000	-	-	20,000
<b>Family Cymatosiraceae</b>				
<i>Cymatosira belgica</i>	12,000	-	-	67,000
<b>Family Chaetoceraceae</b>				
<i>Bacteriastrum delicatulum</i>	-	12,000	-	-



**ตาราง ผลการวิเคราะห์แพลงก์ตอนพืชและแพลงก์ตอนสัตว์ (เก็บตัวอย่างวันที่ 4 ธันวาคม 2566)**

(ต่อ)

กลุ่ม/สกุลของแพลงก์ตอน	ปริมาณแพลงก์ตอน (หน่วยต่อลูกบาศก์เมตร)			
	S1	S2	S3	S4
<i>Bacteriastrum furcatum</i>	-	98,000	-	20,000
<i>Bacteriastrum</i> sp.	12,000	-	-	-
<i>Chaetoceros anastomosans</i>	-	62,000	-	-
<i>Chaetoceros compressus</i>	12,000	-	-	86,000
<i>Chaetoceros curvisetus</i>	155,000	677,000	17,000	80,000
<i>Chaetoceros debilis</i>	-	25,000	-	-
<i>Chaetoceros didymus</i>	6,000	43,000	17,000	80,000
<i>Chaetoceros diversus</i>	25,000	55,000	-	27,000
<i>Chaetoceros laciniosus</i>	19,000	221,000	-	466,000
<i>Chaetoceros lorenzianus</i>	19,000	18,000	-	73,000
<i>Chaetoceros mitra</i>	-	37,000	-	-
<i>Chaetoceros peruvianus</i>	12,000	12,000	-	27,000
<i>Chaetoceros pseudocurvisetus</i>	-	148,000	-	100,000
<i>Chaetoceros socialis</i>	68,000	111,000	-	599,000
<i>Chaetoceros</i> sp.	56,000	406,000	34,000	532,000
<i>Chaetoceros tortissimus</i>	-	-	-	40,000
<b>Family Lithodesmaceae</b>				
<i>Ditylum brightwellii</i>	-	18,000	-	13,000
<i>Ditylum sol</i>	12,000	-	-	13,000
<i>Helicotheca tamesis</i>	-	123,000	-	-
<b>Family Eupodiscaceae</b>				
<i>Odontella aurita</i>	-	12,000	9,000	-
<i>Odontella mobiliensis</i>	6,000	105,000	-	7,000
<i>Odontella sinensis</i>	19,000	74,000	-	67,000

**ตาราง ผลการวิเคราะห์แพลงก์ตอนพืชและแพลงก์ตอนสัตว์ (เก็บตัวอย่างวันที่ 4 ธันวาคม 2566)**

(ต่อ)

กลุ่ม/สกุลของแพลงก์ตอน	ปริมาณแพลงก์ตอน (หน่วยต่อลูกบาศก์เมตร)			
	S1	S2	S3	S4
<b>Family Eupodiscaceae</b>				
<i>Odontella aurita</i>	-	12,000	9,000	-
<i>Odontella mobiliensis</i>	6,000	105,000	-	7,000
<i>Odontella sinensis</i>	19,000	74,000	-	67,000
<b>Order Bacillariales</b>				
<b>Suborder Fragilariineae</b>				
<b>Family Fragilariaceae</b>				
<i>Fragilaria capucina</i>	-	-	9,000	-
<b>Family Licmophoriaceae</b>				
<i>Licmophora abbreviata</i>	-	12,000	-	73,000
<b>Family Thalassionemataceae</b>				
<i>Thalassionema bacillare</i>	-	-	-	7,000
<i>Thalassionema frauenfeldii</i>	25,000	369,000	-	-
<i>Thalassionema nitzschioides</i>	-	154,000	-	53,000
<b>Suborder Bacillariineae</b>				
<b>Family Naviculaceae</b>				
<i>Amphora exigua</i>	-	-	17,000	-
<i>Amphora robusta</i>	-	-	-	60,000
<i>Diploneis smithii</i>	-	-	-	106,000
<i>Haslea tromphii</i>	19,000	12,000	-	60,000
<i>Meunier membranacea</i>	-	-	-	100,000
<i>Navicula cuspidata</i>	-	-	17,000	-
<i>Navicula lanceolata</i>	-	-	9,000	53,000
<i>Navicula</i> sp.	-	-	9,000	67,000
<i>Pleurosigma aestuarii</i>	-	-	-	53,000
<i>Pleurosigma angulatum</i>	-	62,000	-	399,000
<i>Pleurosigma elongatum</i>	-	-	-	53,000

**ตาราง ผลการวิเคราะห์แพลงก์ตอนพืชและแพลงก์ตอนสัตว์ (เก็บตัวอย่างวันที่ 4 ธันวาคม 2566)**

(ต่อ)

กลุ่ม/สกุลของแพลงก์ตอน	ปริมาณแพลงก์ตอน (หน่วยต่อลูกบาศก์เมตร)			
	S1	S2	S3	S4
<i>Pleurosigma normanii</i>	25,000	12,000	-	865,000
<i>Stauroneis salina</i>	-	-	-	13,000
<b>Family Bacillariaceae</b>				
<i>Bacillaria paxillaria</i>	-	-	-	7,000
<i>Cylindrotheca closterium</i>	645,000	431,000	17,000	931,000
<i>Nitzschia lorenziana</i>	-	6,000	17,000	732,000
<i>Nitzschia</i> sp.	-	-	-	93,000
<i>Pseudo-nitzschia heimii</i>	-	117,000	-	-
<i>Pseudo-nitzschia</i> sp.	-	-	-	47,000
<i>Tryblionella hungarica</i>	-	-	9,000	-
<b>Family Surirellaceae</b>				
<i>Entomoneis robusta</i>	-	-	-	73,000
<b>Class Dinophyceae</b>				
<b>Order Prorocentrales</b>				
<b>Family Prorocentraceae</b>				
<i>Prorocentrum mexicanum</i>	25,000	-	-	-
<i>Prorocentrum micans</i>	6,000	-	-	-
<b>Order Dinophysiales</b>				
<b>Family Dinophysiales</b>				
<i>Dinophysis caudata</i>	-	12,000	-	-
<i>Phalacroma rudgei</i>	-	6,000	-	20,000
<b>Order Gymnodiniales</b>				
<b>Family Gymnodiniaceae</b>				
<i>Gymnodinium sanguineum</i>	-	-	-	7,000
<i>Gyrodinium spirale</i>	-	-	-	7,000



ตาราง ผลการวิเคราะห์แพลงก์ตอนพืชและแพลงก์ตอนสัตว์ (เก็บตัวอย่างวันที่ 4 ธันวาคม 2566)

(ต่อ)

กลุ่ม/สกุลของแพลงก์ตอน	ปริมาณแพลงก์ตอน (หน่วยต่อลูกบาศก์เมตร)			
	S1	S2	S3	S4
<b>Order Gonyaulacalea</b>				
<b>Family Ceratiaceae</b>				
<i>Ceratium furca</i>	-	12,000	-	-
<i>Ceratium fusus</i>	-	18,000	-	60,000
<i>Ceratium macroceros</i>	-	31,000	-	100,000
<b>Family Pyrophacaceae</b>				
<i>Pyrophacus horologium</i>	-	-	-	7,000
<b>Order Peridiniales</b>				
<b>Family Calciodinellaceae</b>				
<i>Scrippsiella trocoidea</i>	19,000	86,000	-	60,000
<b>Family Protoperidiniaceae</b>				
<i>Protoperidinium angustum</i>	6,000	6,000	-	-
<i>Protoperidinium curtipes</i>	-	68,000	-	20,000
<i>Protoperidinium</i> sp.	37,000	49,000	-	-
<i>Protoperidinium spinulosum</i>	-	6,000	-	-
<b>แพลงก์ตอนสัตว์</b>				
<b>Phylum Protozoa</b>				
<b>Subphylum Plasmodroma</b>				
<b>Class Sarcodina</b>				
<b>Subclass Rhizopoda</b>				
<b>Order Foraminiferida</b>				
<i>Globorotalia</i> sp.	6,000	-	-	-

**ตาราง ผลการวิเคราะห์แพลงก์ตอนพืชและแพลงก์ตอนสัตว์ (เก็บตัวอย่างวันที่ 4 ธันวาคม 2566)**

(ต่อ)

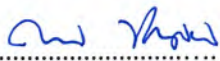
กลุ่ม/สกุลของแพลงก์ตอน	ปริมาณแพลงก์ตอน (หน่วยต่อลูกบาศก์เมตร)			
	S1	S2	S3	S4
<b>Subphylum Ciliophora</b>				
<b>Class Ciliata</b>				
<b>Subclass Spirotricha</b>				
<b>Order Tintinnida</b>				
<b>Family Tintinnididae</b>				
<i>Leprotintinnus nordquisti</i>	6,000	55,000	-	7,000
<b>Family Codonellidae</b>				
<i>Tintinnopsis gracilis</i>	-	6,000	-	-
<i>Tintinnopsis tocaninensis</i>	6,000	-	-	-
<b>Family Codonellopsidae</b>				
<i>Stenosemella nivalis</i>	-	-	-	7,000
<b>Family Cyttarocylis</b>				
<i>Favella panamensis</i>	-	12,000	-	13,000
<b>Subclass Peritricha</b>				
<b>Order Peritrichida</b>				
<i>Vorticella</i> sp.	-	25,000	-	-
<b>Phylum Rotifera</b>				
<b>Class Monogononta</b>				
<b>Order Ploima</b>				
<b>Family Lecanidae</b>				
<i>Lecane inopinata</i>	-	-	9,000	-
<b>Phylum Arthropoda</b>				
<b>Class Crustacea</b>				
<b>Subclass Copepoda</b>				
Copepod nauplii	12,000	185,000	26,000	73,000

**ตาราง ผลการวิเคราะห์แพลงก์ตอนพืชและแพลงก์ตอนสัตว์ (เก็บตัวอย่างวันที่ 4 ธันวาคม 2566)**

(ต่อ)

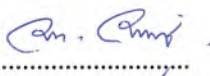
กลุ่ม/สกุลของแพลงก์ตอน	ปริมาณแพลงก์ตอน (หน่วยต่อลูกบาศก์เมตร)			
	S1	S2	S3	S4
<b>Order Calanoida</b>				
Calanoid copepod	6,000	-	9,000	-
<b>Order Cyclopoida</b>				
Cyclopoid copepod	-	-	-	40,000
<b>Order Harpacticoida</b>				
Harpacticoid copepod	-	-	-	7,000
<b>Phylum Mollusca</b>				
<b>Class Bivalvia</b>				
Pelecypod larvae	-	-	436,000	7,000
<b>Phylum Chordata</b>				
<b>Subphylum Urochordata</b>				
<b>Class Larvacea</b>				
<b>Family Oikopleuridae</b>				
<i>Oikopleura</i> sp.	6,000	18,000	-	13,000
ชนิดของแพลงก์ตอนพืช	38	58	24	75
ชนิดของแพลงก์ตอนสัตว์	6	6	4	8
ชนิดแพลงก์ตอนรวม	44	64	28	83
ปริมาณแพลงก์ตอนพืช	1,810,000	6,041,000	374,000	7,830,000
ปริมาณแพลงก์ตอนสัตว์	42,000	301,000	480,000	167,000
ปริมาณแพลงก์ตอนรวม	1,852,000	6,342,000	854,000	7,997,000
ค่าดัชนีความหลากหลายแพลงก์ตอนพืช	2.6353	3.2318	2.9809	3.4465
ค่าดัชนีความหลากหลายแพลงก์ตอนสัตว์	1.7479	1.1914	0.3944	1.6334
ค่าดัชนีความสม่ำเสมอแพลงก์ตอนพืช	0.7245	0.7959	0.9380	0.7983
ค่าดัชนีความสม่ำเสมอแพลงก์ตอนสัตว์	0.9755	0.6649	0.2845	0.7855

- หมายเหตุ :
1. สถานี S1 : เกาะสะเก็ด
  2. สถานี S2 : หาดทรายทอง
  3. สถานี S3 : จุดระบายน้ำทิ้งของโรงกลั่นน้ำมันลงทะเล
  4. สถานี S4 : ทะเลเปิด



(นางสาวกนกวรรณ ขาวดอน)

ผู้วิเคราะห์



(นายอลงกต อินทรชาติ)

หัวหน้าสถานีวิจัยประมงศรีราชา





สถานีวิจัยประมงศรีราชา  
101/12 หมู่ 9 ต. บางพระ  
อ. ศรีราชา จ. ชลบุรี 20110  
โทร./โทรสาร. (038) 311379

รายงานผลการวิเคราะห์สัตว์หน้าดิน

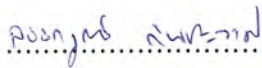
ตาราง ผลการวิเคราะห์สัตว์หน้าดิน (เก็บตัวอย่างวันที่ 4 ธันวาคม 2566)

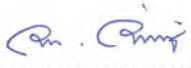
ชนิดสัตว์หน้าดิน	ปริมาณสัตว์หน้าดิน (ตัวต่อตารางเมตร)			
	S1	S2	S3	S4
<b>Phylum Annelida</b>				
<b>Class Polychaeta</b>				
<b>Order Capitellida</b>				
<b>Family Capitellidae</b>				
<i>Heteromastus</i> sp. (ไส้เดือนทะเล)	30	30	-	-
<b>Order Eunicida</b>				
<b>Family Eunicidae</b>				
<i>Marphysa</i> sp. (ไส้เดือนทะเล)	15	-	15	45
<b>Order Opheliida</b>				
<b>Family Opheliidae</b>				
<i>Armandia</i> sp. (ไส้เดือนทะเล)	30	30	-	-
<b>Order Orbiniida</b>				
<b>Family Orbiniidae</b>				
<i>Scoloplos</i> sp. (ไส้เดือนทะเล)	-	-	30	30
<b>Order Phyllodocida</b>				
<b>Family Nereididae</b>				
<i>Nereis</i> sp. (แม่เพรียง)	-	-	-	30

ตาราง ผลการวิเคราะห์สัตว์หน้าดิน (เก็บตัวอย่างวันที่ 4 ธันวาคม 2566) (ต่อ)

ชนิดสัตว์หน้าดิน	ปริมาณสัตว์หน้าดิน (ตัวต่อตารางเมตร)			
	S1	S2	S3	S4
<b>Phylum Arthropoda</b> <b>Class Malacostraca</b> <b>Order Amphipoda</b> <b>Family Ampeliscidae</b> <i>Ampelisca</i> sp. (แอมพีพอด)	-	-	-	15
<b>Phylum Mollusca</b> <b>Class Bivalvia</b> <b>Order Cardiida</b> <b>Family Tellinidae</b> <i>Tellina</i> sp. (หอยสองฝาชนิดหนึ่ง)	-	15	-	-
<b>Order Myida</b> <b>Family Corbulidae</b> <i>Corbula</i> sp. (หอยสองฝาชนิดหนึ่ง)	-	-	-	15
<b>Order Venerida</b> <b>Family Veneridae</b> <i>Dosinia</i> sp. (หอยสองฝาชนิดหนึ่ง)	-	-	-	15
<b>ชนิดสัตว์หน้าดิน</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>6</b>
<b>ปริมาณสัตว์หน้าดิน</b>	<b>75</b>	<b>75</b>	<b>45</b>	<b>150</b>
<b>ค่าดัชนีความหลากหลายสัตว์หน้าดิน</b>	<b>1.0549</b>	<b>1.0549</b>	<b>0.6365</b>	<b>1.6957</b>

- หมายเหตุ :
1. สถานี S1 : เกาะสะเก็ด
  2. สถานี S2 : หาดทรายทอง
  3. สถานี S3 : จุดระบายน้ำทิ้งของโรงกลั่นน้ำมันลงทะเล
  4. สถานี S4 : ทะเลเปิด

  
 .....  
 (นายอรรถวุฒิ กันทะวงศ์)  
 ผู้วิเคราะห์

  
 .....  
 (นายอลงกต อินทรชาติ)  
 หัวหน้าสถานีวิจัยประมงศรีราชา

## ใบรับรองผลการตรวจวัดคุณภาพน้ำใต้ดิน



บริษัท ซีคอต จำกัด  
SECOT CO., LTD.

239 ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพมหานคร 10800  
239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND

TEL. (662) 959-3600 FAX (662) 959-3535 Website : secot.co.th E-mail : envserv@secot.co.th

GROUND WATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No	: 0486/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 20-21/03/2023	SAMPLING TIME	: 11:14-11:27, 14:13-14:25
RECEIVED DATE	: 25/03/2023	ANALYTICAL DATE	: 27-28/03/2023
REPORT DATE	: 01/04/2023	SITE OPERATOR	: Mr. Aniwat Pimwhanna
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_GW_March

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD <sup>1/</sup>
				MW-101B	MW-102A	
Chromium (Cr)	mg/l	3120 B	< 0.001	ND	ND	≤ 6.0
Manganese (Mn)	mg/l	3120 B	< 0.001	0.02	0.02	≤ 33
Mercury (Hg)	mg/l	3112 B	< 0.0001	ND	ND	≤ 0.7
Nickel (Ni)	mg/l	3120 B	< 0.002	ND	ND	≤ 5.0

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 21<sup>st</sup> ED. 2017 (AWWA.APHA.WEF)

  
(Miss Krisana Chanthoom)

Analyst

REG. NO. ๖-239-๖-7802

  
(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. ๖-239-ก-5863

- Remark :**
1. Reported analysis refers to submitted sample only.
  2. This report shall not be reproduced, except in full, without official approval.
  3. <sup>1/</sup> Notification of the Ministry of Industry, B.E.2559 (2016).





บริษัท ซีคอต จำกัด  
SECOT CO., LTD.

239 ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพมหานคร 10800  
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TEL. (662) 959-3600 FAX (662) 959-3535 Website : secot.co.th E-mail : envserv@secot.co.th

GROUND WATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No. :	0486/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 20-21/03/2023	SAMPLING TIME	: 11:14-11:27, 14:13-14:25
RECEIVED DATE	: 25/03/2023	ANALYTICAL DATE	: 29-30/03/2023
REPORT DATE	: 01/04/2023	SITE OPERATOR	: Mr. Aniwat Pimwhanna
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_GW_March

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD <sup>1/</sup>
				MW-101B	MW-102A	
Benzene	mg/l	6200 B	< 0.0002	ND	ND	< 0.2
Ethylbenzene	mg/l	6200 B	< 0.0002	ND	ND	< 2.0
Toluene	mg/l	6200 B	< 0.0002	ND	ND	< 5.0
m-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
o-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
p-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
Total Xylenes	mg/l	6200 B	< 0.0006	ND	ND	≤ 24

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED. 2017 (AWWA, APHA, WEF)

Jutarat Jaemruen  
( Miss Jutarat Jaemruen )

Analyst

REG. NO. 3-239-ก-5827

Araya Tipparuk  
(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 3-239-ก-5863

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3. <sup>1/</sup> Notification of the Ministry of Industry, B.E.2559 (2016).



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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No	: 0486/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 20-21/03/2023	SAMPLING TIME	: 11:14-11:27, 14:13-14:25
RECEIVED DATE	: 25/03/2023	ANALYTICAL DATE	: 29-30/03/2023
REPORT DATE	: 01/04/2023	SITE OPERATOR	: Mr. Aniwat Pimwhanna
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_GW_March

PARAMETER	UNIT	ANALYSIS	ND	STATION		STANDARD <sup>1/</sup>
		METHODS	(non-detectable)	MW-101B	MW-102A	
<u>Total Petroleum Hydrocarbon</u>						
- TPH (C <sub>5</sub> - C <sub>8</sub> )	mg/l	5030 C/8260 D	< 0.003	ND	ND	≤ 1.4
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
- TPH (C <sub>9</sub> - C <sub>16</sub> )	mg/l	3510 C/8015 D	< 0.025	ND	ND	≤ 1.7
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
- TPH (C <sub>17</sub> - C <sub>35</sub> )	mg/l	3510 C/8015 D	< 0.050	ND	ND	≤ 0.1
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- n-Dotriacontane						
- n-Tetratriacontane						
- Pentatriacontane						

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED. 2017 (AWWA, APHA, WEF)

Sudaporn Soonthorn  
(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-ก-0001

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-ก-5863

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No	: 0486/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 20/03/2023	SAMPLING TIME	: 10:31-10:39, 10:01-10:06
RECEIVED DATE	: 25/03/2023	ANALYTICAL DATE	: 27-28/03/2023
REPORT DATE	: 01/04/2023	SITE OPERATOR	: Mr. Aniwat Pimwhanna
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_GW_March


PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD <sup>1)</sup>
				MW-103A	MW-104A	
Chromium (Cr)	mg/l	3120 B	< 0.001	< 0.01	< 0.01	≤ 6.0
Manganese (Mn)	mg/l	3120 B	< 0.001	< 0.01	0.07	≤ 33
Mercury (Hg)	mg/l	3112 B	< 0.0001	ND	ND	≤ 0.7
Nickel (Ni)	mg/l	3120 B	< 0.002	ND	< 0.01	≤ 5.0

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED. 2017 (AWWA, APHA, WEF)

  
(Miss Krisana Chanthoom)

Analyst

REG. NO. ๓-239-๖-7802

  
(Mrs. Araya Tipparuk)

Technical Management Team

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 0486/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 20/03/2023	SAMPLING TIME	: 10:31-10:39, 10:01-10:06
RECEIVED DATE	: 25/03/2023	ANALYTICAL DATE	: 29-30/03/2023
REPORT DATE	: 01/04/2023	SITE OPERATOR	: Mr. Aniwat Pimwhanna
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_GW_March

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD <sup>1/</sup>
				MW-103A	MW-104A	
Benzene	mg/l	6200 B	< 0.0002	ND	ND	< 0.2
Ethylbenzene	mg/l	6200 B	< 0.0002	ND	ND	< 2.0
Toluene	mg/l	6200 B	< 0.0002	ND	ND	< 5.0
m-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
o-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
p-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
Total Xylenes	mg/l	6200 B	< 0.0006	ND	ND	≤ 24

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED. 2017 (AWWA, APHA, WEF)

Jutarat Jaemruen  
( Miss Jutarat Jaemruen )

Analyst

REG. NO. 3-239-ก-5827

Araya Tipparuk  
(Mrs. Araya Tipparuk)

Technical Management Team

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GROUND WATER ANALYSIS REPORT

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SAMPLING DATE	: 20/03/2023	SAMPLING TIME	: 10:31-10:39, 10:01-10:06
RECEIVED DATE	: 25/03/2023	ANALYTICAL DATE	: 29-30/03/2023
REPORT DATE	: 01/04/2023	SITE OPERATOR	: Mr. Aniwat Pimwhanna
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_GW_March

PARAMETER	UNIT	ANALYSIS	ND	STATION		STANDARD <sup>1/</sup>
		METHODS	(non-detectable)	MW-103A	MW-104A	
<u>Total Petroleum Hydrocarbon</u>						
- TPH (C <sub>5</sub> - C <sub>8</sub> )	mg/l	5030 C/8260 D	< 0.003	ND	ND	≤ 1.4
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
- TPH (C <sub>&gt;8</sub> - C <sub>16</sub> )	mg/l	3510 C/8015 D	< 0.025	ND	ND	≤ 1.7
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
- TPH (C <sub>&gt;16</sub> - C <sub>35</sub> )	mg/l	3510 C/8015 D	< 0.050	ND	ND	≤ 0.1
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- n-Dotriacontane						
- n-Tetratriacontane						
- Pentatriacontane						

REFERENCE: STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED. 2017 (AWWA, APHA, WEF)

*Sudaporn Soonthorn*  
(Miss Sudaporn Soonthorn)

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*(Mrs. Araya Tipparuk)*

Technical Management Team

REG. NO. 7-239-0-5863

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No	: 0486/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 21/03/2023	SAMPLING TIME	: 09:22-09:30, 09:49-09:55
RECEIVED DATE	: 25/03/2023	ANALYTICAL DATE	: 27-28/03/2023
REPORT DATE	: 01/04/2023	SITE OPERATOR	: Mr. Aniwat Pimwhanna
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_GW_March

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD <sup>1/</sup>
				MW-105B	MW-106B	
Chromium (Cr)	mg/l	3120 B	< 0.001	ND	< 0.01	≤ 6.0
Manganese (Mn)	mg/l	3120 B	< 0.001	2.93	0.37	≤ 33
Mercury (Hg)	mg/l	3112 B	< 0.0001	ND	ND	≤ 0.7
Nickel (Ni)	mg/l	3120 B	< 0.002	< 0.01	< 0.01	≤ 5.0

REFERENCE: STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED., 2017 (AWWA, APHA, WEF)

  
(Miss Krisana Chanthoom)

Analyst

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(Mrs. Araya Tipparuk)

Technical Management Team

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 0486/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
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REPORT DATE	: 01/04/2023	SITE OPERATOR	: Mr. Aniwat Pimwhanna
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_GW_March

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD <sup>1/</sup>
				MW-105B	MW-106B	
Benzene	mg/l	6200 B	< 0.0002	ND	ND	< 0.2
Ethylbenzene	mg/l	6200 B	< 0.0002	ND	ND	< 2.0
Toluene	mg/l	6200 B	< 0.0002	ND	ND	< 5.0
m-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
o-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
p-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
Total Xylenes	mg/l	6200 B	< 0.0006	ND	ND	≤ 24

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED. 2017 (AWWA, APHA, WEF)

Jutarat Jaemruen  
( Miss Jutarat Jaemruen )

Analyst

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Technical Management Team

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GROUND WATER ANALYSIS REPORT

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RECEIVED DATE	: 25/03/2023	ANALYTICAL DATE	: 29-30/03/2023
REPORT DATE	: 01/04/2023	SITE OPERATOR	: Mr. Aniwat Pimwhanna
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_GW_March

PARAMETER	UNIT	ANALYSIS	ND	STATION		STANDARD <sup>1/</sup>
		METHODS	(non-detectable)	MW-105B	MW-106B	
<u>Total Petroleum Hydrocarbon</u>						
- TPH (C <sub>5</sub> - C <sub>8</sub> )	mg/l	5030 C/8260 D	< 0.003	ND	ND	≤ 1.4
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
- TPH (C <sub>9</sub> - C <sub>16</sub> )	mg/l	3510 C/8015 D	< 0.025	ND	ND	≤ 1.7
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
- TPH (C <sub>17</sub> - C <sub>35</sub> )	mg/l	3510 C/8015 D	< 0.050	ND	ND	≤ 0.1
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- n-Dotriacontane						
- n-Tetratriacontane						
- Pentatriacontane						

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED. 2017 (AWWA, APHA, WEF)

Sudaporn Soonthorn

(Miss Sudaporn Soonthorn)

Analyst

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Technical Management Team

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No	: 0486/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 21-22/03/2023	SAMPLING TIME	: 14:13-14:30, 09:59-10:05
RECEIVED DATE	: 25/03/2023	ANALYTICAL DATE	: 27-28/03/2023
REPORT DATE	: 01/04/2023	SITE OPERATOR	: Mr. Aniwat Pimwhanna
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_GW_March

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD <sup>U</sup>
				MW-107C	MW-108B	
Chromium (Cr)	mg/l	3120 B	< 0.001	< 0.01	< 0.01	≤ 6.0
Manganese (Mn)	mg/l	3120 B	< 0.001	0.30	0.22	≤ 33
Mercury (Hg)	mg/l	3112 B	< 0.0001	ND	ND	≤ 0.7
Nickel (Ni)	mg/l	3120 B	< 0.002	< 0.01	< 0.01	≤ 5.0

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED. 2017 (AWWA, APHA, WEF)

  
(Miss Krisana Chanthoom)

Analyst

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No. :	0486/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 21-22/03/2023	SAMPLING TIME	: 14:13-14:30, 09:59-10:05
RECEIVED DATE	: 25/03/2023	ANALYTICAL DATE	: 29-30/03/2023
REPORT DATE	: 01/04/2023	SITE OPERATOR	: Mr. Aniwat Pimwhanna
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_GW_March

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD <sup>1/</sup>
				MW-107C	MW-108B	
Benzene	mg/l	6200 B	< 0.0002	ND	ND	< 0.2
Ethylbenzene	mg/l	6200 B	< 0.0002	ND	ND	< 2.0
Toluene	mg/l	6200 B	< 0.0002	ND	ND	< 5.0
m-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
o-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
p-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
Total Xylenes	mg/l	6200 B	< 0.0006	ND	ND	≤ 24

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED., 2017 (AWWA, APHA, WEF)

Jutarat Jaemruen  
( Miss Jutarat Jaemruen )

Analyst

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No	: 0486/66
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SAMPLING DATE	: 21-22/03/2023	SAMPLING TIME	: 14:13-14:30, 09:59-10:05
RECEIVED DATE	: 25/03/2023	ANALYTICAL DATE	: 29-30/03/2023
REPORT DATE	: 01/04/2023	SITE OPERATOR	: Mr. Aniwat Pimwhanna
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_GW_March

PARAMETER	UNIT	ANALYSIS	ND	STATION		STANDARD <sup>1/</sup>
		METHODS	(non-detectable)	MW-107C	MW-108B	
<u>Total Petroleum Hydrocarbon</u>						
- TPH (C <sub>5</sub> - C <sub>8</sub> )	mg/l	5030 C/8260 D	< 0.003	ND	ND	≤ 1.4
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
- TPH (C <sub>&gt;8</sub> - C <sub>16</sub> )	mg/l	3510 C/8015 D	< 0.025	ND	ND	≤ 1.7
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
- TPH (C <sub>&gt;16</sub> - C <sub>35</sub> )	mg/l	3510 C/8015 D	< 0.050	ND	ND	≤ 0.1
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- Dotriacontane						
- n-Tetracontane						
- Pentatriacontane						

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED. 2017 (AWWA, APHA, WEF)

*Sudaporn Soonthorn*

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. ๖-239-๖-0001

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(Mrs. Araya Tipparuk)

Technical Management Team

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No	: 0486/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 23-24/03/2023	SAMPLING TIME	: 09:55-10:01, 15:00-15:11
RECEIVED DATE	: 25/03/2023	ANALYTICAL DATE	: 27-28/03/2023
REPORT DATE	: 01/04/2023	SITE OPERATOR	: Mr. Aniwat Pimwhanna
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_GW_March

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD <sup>1/</sup>
				MW-109A	MW-111A	
Chromium (Cr)	mg/l	3120 B	< 0.001	< 0.01	< 0.01	≤ 6.0
Manganese (Mn)	mg/l	3120 B	< 0.001	0.20	0.26	≤ 33
Mercury (Hg)	mg/l	3112 B	< 0.0001	ND	ND	≤ 0.7
Nickel (Ni)	mg/l	3120 B	< 0.002	< 0.01	ND	≤ 5.0

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED. 2017 (AWWA, APHA, WEF)

  
(Miss Krisana Chanthoom)

Analyst

REG. NO. 3-239-0-7802

  
(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 3-239-0-5863

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No. :	0486/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 23-24/03/2023	SAMPLING TIME	: 09:55-10:01, 15:00-15:11
RECEIVED DATE	: 25/03/2023	ANALYTICAL DATE	: 29-30/03/2023
REPORT DATE	: 01/04/2023	SITE OPERATOR	: Mr. Aniwat Pimwhanna
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_GW_March

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD <sup>1/</sup>
				MW-109A	MW-111A	
Benzene	mg/l	6200 B	< 0.0002	ND	ND	< 0.2
Ethylbenzene	mg/l	6200 B	< 0.0002	ND	ND	< 2.0
Toluene	mg/l	6200 B	< 0.0002	ND	ND	< 5.0
m-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
o-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
p-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
Total Xylenes	mg/l	6200 B	< 0.0006	ND	ND	≤ 24

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED., 2017 (AWWA, APHA, WEF)

Jutarat Jaemruen  
( Miss Jutarat Jaemruen )

Analyst

REG. NO. ๖-239-๖-5827

Araya Tipparuk  
(Mrs. Araya Tipparuk)

Technical Management Team

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No	: 0486/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 23-24/03/2023	SAMPLING TIME	: 09:55-10:01, 15:00-15:11
RECEIVED DATE	: 25/03/2023	ANALYTICAL DATE	: 29-30/03/2023
REPORT DATE	: 01/04/2023	SITE OPERATOR	: Mr. Aniwat Pimwhanna
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_GW_March

PARAMETER	UNIT	ANALYSIS	ND	STATION		STANDARD <sup>1/</sup>
		METHODS	(non-detectable)	MW-109A	MW-111A	
<u>Total Petroleum Hydrocarbon</u>						
- TPH (C <sub>5</sub> - C <sub>8</sub> )	mg/l	5030 C/8260 D	< 0.003	ND	ND	≤ 1.4
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
- TPH (C <sub>9</sub> - C <sub>16</sub> )	mg/l	3510 C/8015 D	< 0.025	ND	ND	≤ 1.7
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
- TPH (C <sub>16</sub> - C <sub>35</sub> )	mg/l	3510 C/8015 D	< 0.050	ND	ND	≤ 0.1
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- n-Dotriacontane						
- n-Tetratriacontane						
- Pentatriacontane						

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 21<sup>st</sup> ED. 2017 (AWWA, APHA, WEF)

Sudaporn Soonthorn  
(Miss Sudaporn Soonthorn)

Analyst

REG. NO. ๓-239-๓-0001

Araya Tipparuk  
(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. ๓-239-๓-5863

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No	: 0486/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 22-23/03/2023	SAMPLING TIME	: 14:32-14:40, 14:14-14:20
RECEIVED DATE	: 25/03/2023	ANALYTICAL DATE	: 27-28/03/2023
REPORT DATE	: 01/04/2023	SITE OPERATOR	: Mr. Aniwat Pimwhanna
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_GW_March

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD <sup>1/</sup>
				MW-112A	MW-113A	
Chromium (Cr)	mg/l	3120 B	< 0.001	ND	ND	≤ 6.0
Manganese (Mn)	mg/l	3120 B	< 0.001	0.03	0.02	≤ 33
Mercury (Hg)	mg/l	3112 B	< 0.0001	ND	ND	≤ 0.7
Nickel (Ni)	mg/l	3120 B	< 0.002	< 0.01	< 0.01	≤ 5.0

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED, 2017 (AWWA, APHA, WEF)

  
(Miss Krisana Chanthoom)

Analyst

REG. NO. ๖-239-๖-7802

  
(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. ๖-239-๓-5863

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No. :	0486/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 22-23/03/2023	SAMPLING TIME	: 14:32-14:40, 14:14-14:20
RECEIVED DATE	: 25/03/2023	ANALYTICAL DATE	: 29-30/03/2023
REPORT DATE	: 01/04/2023	SITE OPERATOR	: Mr. Aniwat Pimwhanna
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_GW_March

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD <sup>1)</sup>
				MW-112A	MW-113A	
Benzene	mg/l	6200 B	< 0.0002	ND	ND	< 0.2
Ethylbenzene	mg/l	6200 B	< 0.0002	ND	ND	< 2.0
Toluene	mg/l	6200 B	< 0.0002	ND	ND	< 5.0
m-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
o-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
p-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
Total Xylenes	mg/l	6200 B	< 0.0006	ND	ND	≤ 24

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED. 2017 (AWWA, APHA, WEF)

Jutarat Jaemruen

( Miss Jutarat Jaemruen )

Analyst

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Araya Tipparuk

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Technical Management Team

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No	: 0486/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 22-23/03/2023	SAMPLING TIME	: 14:32-14:40, 14:14-14:20
RECEIVED DATE	: 25/03/2023	ANALYTICAL DATE	: 29-30/03/2023
REPORT DATE	: 01/04/2023	SITE OPERATOR	: Mr. Aniwat Pimwhanna
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_GW_March

PARAMETER	UNIT	ANALYSIS	ND	STATION		STANDARD <sup>1/</sup>
		METHODS	(non-detectable)	MW-112A	MW-113A	
<u>Total Petroleum Hydrocarbon</u>						
- TPH (C <sub>5</sub> - C <sub>8</sub> )	mg/l	5030 C/8260 D	< 0.003	ND	ND	≤ 1.4
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
- TPH (C <sub>9</sub> - C <sub>16</sub> )	mg/l	3510 C/8015 D	< 0.025	ND	ND	≤ 1.7
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
- TPH (C <sub>17</sub> - C <sub>35</sub> )	mg/l	3510 C/8015 D	< 0.050	ND	ND	≤ 0.1
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- n-Dotriacontane						
- n-Tetratriacontane						
- Pentatriacontane						

REFERENCE: STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED. 2017 (AWWA, APHA, WEF)

Sudaporn Soonthorn  
(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 2-239-ก-0001

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 2-239-ก-5863

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No	: 0486/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 21, 24/03/2023	SAMPLING TIME	: 09:27-09:35, 10:28-10:34
RECEIVED DATE	: 25/03/2023	ANALYTICAL DATE	: 27-28/03/2023
REPORT DATE	: 01/04/2023	SITE OPERATOR	: Mr. Aniwat Pimwhanna
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_GW_March

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD <sup>1/</sup>
				MW-114A	MW-115A	
Chromium (Cr)	mg/l	3120 B	< 0.001	ND	< 0.01	≤ 6.0
Manganese (Mn)	mg/l	3120 B	< 0.001	0.05	0.45	≤ 33
Mercury (Hg)	mg/l	3112 B	< 0.0001	ND	ND	≤ 0.7
Nickel (Ni)	mg/l	3120 B	< 0.002	ND	0.01	≤ 5.0

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED, 2017 (AWWA, APHA, WEF)

  
(Miss Krisana Chanthoom)

Analyst

REG. NO. 3-239-ก-7802

  
(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 3-239-ก-5863

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No. :	0486/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 21, 24/03/2023	SAMPLING TIME	: 09:27-09:35, 10:28-10:34
RECEIVED DATE	: 25/03/2023	ANALYTICAL DATE	: 29-30/03/2023
REPORT DATE	: 01/04/2023	SITE OPERATOR	: Mr. Aniwat Pimwhanna
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_GW_March

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD <sup>1/</sup>
				MW-114A	MW-115A	
Benzene	mg/l	6200 B	< 0.0002	ND	ND	< 0.2
Ethylbenzene	mg/l	6200 B	< 0.0002	ND	ND	< 2.0
Toluene	mg/l	6200 B	< 0.0002	ND	ND	< 5.0
m-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
o-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
p-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
Total Xylenes	mg/l	6200 B	< 0.0006	ND	ND	≤ 24

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 21<sup>st</sup> ED, 2017 (AWWA, APHA, WEF)

Jutarat Jaemruen  
( Miss Jutarat Jaemruen )

Analyst

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No	: 0486/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 21, 24/03/2023	SAMPLING TIME	: 09:27-09:35, 10:28-10:34
RECEIVED DATE	: 25/03/2023	ANALYTICAL DATE	: 29-30/03/2023
REPORT DATE	: 01/04/2023	SITE OPERATOR	: Mr. Aniwat Pimwhanna
SAMPLE CONDITION	: Normal	FILE CODE	: 223003_GW_March

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD <sup>1/</sup>
				MW-114A	MW-115A	
<u>Total Petroleum Hydrocarbon</u>						
- TPH (C <sub>5</sub> - C <sub>8</sub> )	mg/l	5030 C/8260 D	< 0.003	ND	ND	≤ 1.4
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
- TPH (C <sub>9</sub> - C <sub>16</sub> )	mg/l	3510 C/8015 D	< 0.025	ND	ND	≤ 1.7
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
- TPH (C <sub>17</sub> - C <sub>35</sub> )	mg/l	3510 C/8015 D	< 0.050	ND	ND	≤ 0.1
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- n-Dotriacontane						
- n-Tetratriacontane						
- Pentatriacontane						

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 23<sup>rd</sup> ED., 2017 (AWWA, APHA, WEF)

Sudaporn Soonthorn  
(Miss Sudaporn Soonthorn)

Analyst

REG. NO. ๖-239-๓-0001

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. ๖-239-๓-5863

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SOIL SAMPLES ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 0662/64
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Hand Auger
SAMPLING DATE	: 22,24/03/2021	SAMPLING TIME	: 10.20-10.40 , 09.30-09.50
RECEIVED DATE	: 27/03/2021	ANALYTICAL DATE	: 02/04/2021
REPORT DATE	: 08/04/2021	SITE OPERATOR	: Mr. Baworn Deechaiya
SAMPLE CONDITION	: Normal	FILE CODE	: 221003_Soil_March

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD <sup>1/</sup>
				MW-101 B	MW-102 A	
Naphthalene	mg/kg	3540 C / 8270 D	< 0.005	ND	ND	≤ 1,000
Hexane	mg/kg	5035 A / 8260 D	< 0.001	ND	ND	≤ 1,000
Benzene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 15
Toluene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 520
m-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 210
o-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 210
p-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 210
Total Xylenes	mg/kg	5035 A / 8260 D	< 0.00075	ND	ND	≤ 210

REFERENCE : US EPA SW 846 TEST METHODS FOR EVALUATING WATER AND SOLID WASTE, 3<sup>rd</sup> ED., 2020

Natsiri L.

( Miss Natsiri Lerterapipat )

Analyst

REG. NO. 7-239-ท-6423

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-ท-5863

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  4. - Not available.



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SOIL SAMPLES ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 0662/64
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Hand Auger
SAMPLING DATE	: 22,24/03/2021	SAMPLING TIME	: 10.20-10.40 , 09.30-09.50
RECEIVED DATE	: 27/03/2021	ANALYTICAL DATE	: 30/03/2021-02/04/2021
REPORT DATE	: 08/04/2021	SITE OPERATOR	: Mr. Baworn Deechaiya
SAMPLE CONDITION	: Normal	FILE CODE	: 221003_Soil_March

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD <sup>1/</sup>
				MW-101 B	MW-102 A	
<u>Total Petroleum Hydrocarbons</u>						
- TPH (C <sub>5</sub> - C <sub>8</sub> )	mg/kg	5035A /8260 D	< 0.003	ND	ND	≤ 25
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
- TPH (C <sub>9</sub> - C <sub>16</sub> )	mg/kg	3540C/8015 D	< 0.25	ND	ND	≤ 25
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
- TPH (C <sub>17</sub> - C <sub>35</sub> )	mg/kg	3540C/8015 D	< 1.85	ND	ND	≤ 8
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- n-Dotriacontane						
- n-Tetratriacontane						
- Pentatriacontane						

REFERENCE : US EPA SW 846 TEST METHODS FOR EVALUATING WATER AND SOLID WASTE, 3<sup>rd</sup> ED., 2020.

*Kesvarin Sinsueg*  
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Analyst

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Technical Management Team

REG. NO. 7-239-ก-5863

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SOIL SAMPLES ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 0662/64
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Hand Auger
SAMPLING DATE	: 22-23/03/2021	SAMPLING TIME	: 10:50-11:10 ,09:40-09:53
RECEIVED DATE	: 27/03/2021	ANALYTICAL DATE	: 02/04/2021
REPORT DATE	: 08/04/2021	SITE OPERATOR	: Mr. Baworn Deechaiya
SAMPLE CONDITION	: Normal	FILE CODE	: 221003_Soil_March

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD <sup>1/</sup>
				MW-103 A	MW-104 A	
Naphthalene	mg/kg	3540 C / 8270 D	< 0.005	ND	ND	≤ 1,000
Hexane	mg/kg	5035 A / 8260 D	< 0.001	ND	ND	≤ 1,000
Benzene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 15
Toluene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 520
m-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 210
o-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 210
p-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 210
Total Xylenes	mg/kg	5035 A / 8260 D	< 0.00075	ND	ND	≤ 210

REFERENCE : US EPA SW 846 TEST METHODS FOR EVALUATING WATER AND SOLID WASTE 3<sup>rd</sup> ED. 2020

Natsiri L.

(Miss Natsiri Lertterapipat)

Analyst

REG. NO. ๓-239-๓-6423

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SOIL SAMPLES ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 0662/64
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Hand Auger
SAMPLING DATE	: 22-23/03/2021	SAMPLING TIME	: 10:50-11.10 ,09.40-09.53
RECEIVED DATE	: 27/03/2021	ANALYTICAL DATE	: 30/03/2021-02/04/2021
REPORT DATE	: 08/04/2021	SITE OPERATOR	: Mr. Baworn Dechaiya
SAMPLE CONDITION	: Normal	FILE CODE	: 221003_Soil_March

PARAMETER	UNIT	ANALYSIS	ND	STATION		STANDARD <sup>1/</sup>
		METHODS	(non-detectable)	MW-103 A	MW-104 A	
Total Petroleum Hydrocarbons						
- TPH (C <sub>5</sub> - C <sub>8</sub> )	mg/kg	5035A /8260 D	< 0.003	ND	ND	≤ 25
- Pentane	mg/kg					
- Benzene	mg/kg					
- Toluene	mg/kg					
- m,p-Xylene	mg/kg					
- o-Xylene	mg/kg					
- Ethylbenzene	mg/kg					
- TPH (C <sub>&gt;8</sub> - C <sub>16</sub> )	mg/kg	3540C/8015 D	< 0.25	ND	ND	≤ 25
- n-Nonane	mg/kg					
- n-Decane	mg/kg					
- n-Dodecane	mg/kg					
- n-Tetradecane	mg/kg					
- n-Hexadecane	mg/kg					
- TPH (C <sub>&gt;16</sub> - C <sub>35</sub> )	mg/kg	3540C/8015 D	< 1.85	ND	ND	≤ 8
- n-Octadecane	mg/kg					
- n-Eicosane	mg/kg					
- n-Docosane	mg/kg					
- n-Tetracosane	mg/kg					
- n-Hexacosane	mg/kg					
- n-Octacosane	mg/kg					
- n-Triacontane	mg/kg					
- n-Dotriacontane	mg/kg					
- n-Tetratriacontane	mg/kg					
- Pentatriacontane	mg/kg					

REFERENCE : US EPA SW 846 TEST METHODS FOR EVALUATING WATER AND SOLID WASTE, 1<sup>st</sup> ED., 2020.

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(Miss Kesvarin Sinsueg)  
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REG. NO. 2-239-ก-5863

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SOIL SAMPLES ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 0662/64
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Hand Auger
SAMPLING DATE	: 23/03/2021	SAMPLING TIME	: 10.15-10.30, 11.00-11.15
RECEIVED DATE	: 27/03/2021	ANALYTICAL DATE	: 02/04/2021
REPORT DATE	: 08/04/2021	SITE OPERATOR	: Mr. Baworn Deechaiya
SAMPLE CONDITION	: Normal	FILE CODE	: 221003_Soil_March

PARAMETER	UNIT	ANALYSIS	ND (non-detectable)	STATION		STANDARD <sup>1/</sup>
		METHODS		MW-105 B	MW-106 B	
Naphthalene	mg/kg	3540 C / 8270 D	< 0.005	ND	ND	≤ 1,000
Hexane	mg/kg	5035 A / 8260 D	< 0.001	ND	ND	≤ 1,000
Benzene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 15
Toluene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 520
m-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 210
o-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 210
p-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 210
Total Xylenes	mg/kg	5035 A / 8260 D	< 0.00075	ND	ND	≤ 210

REFERENCE : US EPA SW 846 TEST METHODS FOR EVALUATING WATER AND SOLID WASTE, 3<sup>rd</sup> ED., 2020

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( Miss Natsiri Lertterapipat )  
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SOIL SAMPLES ANALYSIS REPORT

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SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Hand Auger
SAMPLING DATE	: 23/03/2021	SAMPLING TIME	: 10.15-10.30, 11.00-11.15
RECEIVED DATE	: 27/03/2021	ANALYTICAL DATE	: 30/03/2021-02/04/2021
REPORT DATE	: 08/04/2021	SITE OPERATOR	: Mr. Baworn Deechaiya
SAMPLE CONDITION	: Normal	FILE CODE	: 221003_Soil_March

PARAMETER	UNIT	ANALYSIS	ND	STATION		STANDARD <sup>1/</sup>
		METHODS	(non-detectable)	MW-105 B	MW-106 B	
<u>Total Petroleum Hydrocarbons:</u>						
- TPH (C <sub>5</sub> - C <sub>8</sub> )	mg/kg	5035A /8260 D	< 0.003	ND	ND	≤ 25
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
- TPH (C <sub>9</sub> - C <sub>16</sub> )	mg/kg	3540C/8015 D	< 0.25	ND	ND	≤ 25
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
- TPH (C <sub>17</sub> - C <sub>35</sub> )	mg/kg	3540C/8015 D	< 1.85	ND	ND	≤ 8
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- n-Dotriacontane						
- n-Tetracontane						
- Pentatriacontane						

REFERENCE : US EPA SW 846 TEST METHODS FOR EVALUATING WATER AND SOLID WASTE, 1<sup>st</sup> ED., 2020.

  
(Miss Kesvarin Sinsueg)

Analyst

REG. NO. 3-239-0-6424

  
(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 3-239-0-5863

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SOIL SAMPLES ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 0662/64
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Hand Auger
SAMPLING DATE	: 23,26/03/2021	SAMPLING TIME	: 14.15-14.30, 09.30-09.50
RECEIVED DATE	: 27/03/2021	ANALYTICAL DATE	: 02/04/2021
REPORT DATE	: 08/04/2021	SITE OPERATOR	: Mr. Baworn Deechaiya
SAMPLE CONDITION	: Normal	FILE CODE	: 221003_Soil_March

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD <sup>1)</sup>
				MW-108 B	MW-109 A	
Naphthalene	mg/kg	3540 C / 8270 D	< 0.005	ND	ND	≤ 1,000
Hexane	mg/kg	5035 A / 8260 D	< 0.001	ND	ND	≤ 1,000
Benzene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 15
Toluene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 520
m-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 210
o-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	0.00556	≤ 210
p-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	0.05908	≤ 210
Total Xylenes	mg/kg	5035 A / 8260 D	< 0.00075	ND	0.06464	≤ 210

REFERENCE : US EPA SW 846 TEST METHODS FOR EVALUATING WATER AND SOLID WASTE, 3<sup>rd</sup> ED., 2020

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SOIL SAMPLES ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 0662/64
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Hand Auger
SAMPLING DATE	: 23,26/03/2021	SAMPLING TIME	: 14.15-14.30,09.30-09.50
RECEIVED DATE	: 27/03/2021	ANALYTICAL DATE	: 30/03/2021-02/04/2021
REPORT DATE	: 08/04/2021	SITE OPERATOR	: Mr. Baworn Deechaiya
SAMPLE CONDITION	: Normal	FILE CODE	: 221003_Soil_March

PARAMETER	UNIT	ANALYSIS	ND	STATION		STANDARD <sup>1/</sup>
		METHODS	(non-detectable)	MW-108 B	MW-109 A	
<u>Total Petroleum Hydrocarbons</u>						
- TPH (C <sub>5</sub> - C <sub>8</sub> )	mg/kg	5035A /8260 D	< 0.003	ND	0.14	≤ 25
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
- TPH (C <sub>9</sub> - C <sub>16</sub> )	mg/kg	3540C/8015 D	< 0.25	ND	ND	≤ 25
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
- TPH (C <sub>17</sub> - C <sub>35</sub> )	mg/kg	3540C/8015 D	< 1.85	ND	ND	≤ 8
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- n-Dotriacontane						
- n-Tetratriacontane						
- Pentatriacontane						

REFERENCE : US EPA SW 846 TEST METHODS FOR EVALUATING WATER AND SOLID WASTE, 3<sup>rd</sup> ED., 2020.

*Kesvarin Sinsueg*  
( Miss Kesvarin Sinsueg )

Analyst

REG. NO. 2-239-ก-6424

*Araya Tipparuk*  
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Technical Management Team

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SOIL SAMPLES ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 0662/64
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Hand Auger
SAMPLING DATE	: 24-25/03/2021	SAMPLING TIME	: 08.35-08.55 , 09.20-09.40
RECEIVED DATE	: 27/03/2021	ANALYTICAL DATE	: 02/04/2021
REPORT DATE	: 08/04/2021	SITE OPERATOR	: Mr. Baworn Deechaiya
SAMPLE CONDITION	: Normal	FILE CODE	: 221003_Soil_March

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD <sup>1/</sup>
				MW-112 A	MW-113 A	
Naphthalene	mg/kg	3540 C / 8270 D	< 0.005	ND	ND	≤ 1,000
Hexane	mg/kg	5035 A / 8260 D	< 0.001	ND	ND	≤ 1,000
Benzene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 15
Toluene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 520
m-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 210
o-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 210
p-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 210
Total Xylenes	mg/kg	5035 A / 8260 D	< 0.00075	ND	ND	≤ 210

REFERENCE : US EPA SW 846 TEST METHODS FOR EVALUATING WATER AND SOLID WASTE, 3<sup>rd</sup> ED., 2020

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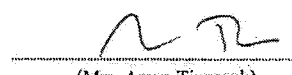
SOIL SAMPLES ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REQUEST SERVICE No.	: 0662/64
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Hand Auger
SAMPLING DATE	: 24-25/03/2021	SAMPLING TIME	: 08.35-08.55 , 09.20-09.40
RECEIVED DATE	: 27/03/2021	ANALYTICAL DATE	: 30/03/2021-02/04/2021
REPORT DATE	: 08/04/2021	SITE OPERATOR	: Mr. Baworn Deechaiya
SAMPLE CONDITION	: Normal	FILE CODE	: 221003_Soil_March

PARAMETER	UNIT	ANALYSIS	ND	STATION		STANDARD <sup>1/</sup>
		METHODS	(non-detectable)	MW-112 A	MW-113 A	
<u>Total Petroleum Hydrocarbons</u>						
- TPH (C <sub>5</sub> - C <sub>8</sub> )	mg/kg	5035A /8260.D	< 0.003	ND	ND	≤ 25
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
- TPH (C <sub>9</sub> - C <sub>16</sub> )	mg/kg	3540C/8015.D	< 0.25	ND	ND	≤ 25
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
- TPH (C <sub>17</sub> - C <sub>35</sub> )	mg/kg	3540C/8015.D	< 1.85	ND	ND	≤ 8
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- n-Dotriacontane						
- n-Tetratriacontane						
- Pentatriacontane						

REFERENCE : US EPA SW 846 TEST METHODS FOR EVALUATING WATER AND SOLID WASTE, 3<sup>rd</sup> ED., 2020.

  
(Miss Kesvarin Sinsueg)  
Analyst  
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3. <sup>1/</sup> Notification of the Ministry of Industry, B.E.2559 (2016).  
4. - Not available.

## ใบรับรองผลการตรวจวัดระดับเสียงภายในสถานประกอบการ





## Noise Monitoring Result : Working Noise

### MTR-SPRC PLC-Refinery

Location : CDU (Near 02GM102A)

Monitor Period : Aug 10, 2023

SLM Model : SCARLET ST-21D

Serial No : 820723

Site Operator : Mr. Watcharakan Pramakhate

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : Sep 12, 2022

SLM Reading / Adjust dB(A) : 93.8/0.0

Expire Date : Sep 11, 2023

Cal Sheet No.: CR-515-2023-121

Time	Equivalent Sound Pressure Level (dB(A))	
	Aug 10, 2023	
00:00 - 01:00		
01:00 - 02:00		
02:00 - 03:00		
03:00 - 04:00		
04:00 - 05:00		
05:00 - 06:00		
06:00 - 07:00		
07:00 - 08:00		
08:00 - 09:00	84.2	
09:00 - 10:00	84.1	
10:00 - 11:00	83.9	
11:00 - 12:00	84.0	
12:00 - 13:00	83.9	
13:00 - 14:00	84.0	
14:00 - 15:00	84.0	
15:00 - 16:00	84.0	
16:00 - 17:00		
17:00 - 18:00		
18:00 - 19:00		
19:00 - 20:00		
20:00 - 21:00		
21:00 - 22:00		
22:00 - 23:00		
23:00 - 24:00		
Leq(8)*	84.0	
Lmax **	87.4	
Standard-8Hr	90 dB(A)	
Standard-Max	140 dB(A)	

Remark : \* Average time between 08:00-16:00

\*\* Maximum Sound Pressure Level between 08:00-16:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Sununta Sirawuttinanon)  
Technical Management Team



## Noise Monitoring Result : Working Noise MTR-SPRC PLC-Refinery

Location : NHTU (Near 08G102A-B)  
SLM Model : SCARLET ST-21D  
Site Operator : Mr. Watcharakan Pramakhate

Monitor Period : Aug 10, 2023  
Serial No : 820722

Calibrator Model : Cirrus CR:515  
Calibration Ref dB(A) : 94.0  
SLM Reading / Adjust dB(A) : 93.8/0.0  
Cal Sheet No.: CR-515-2023-121

Serial No : 94296  
Certified Date : Sep 12, 2022  
Expire Date : Sep 11, 2023

Time	Equivalent Sound Pressure Level (dB(A))	
	Aug 10, 2023	
00:00 - 01:00		
01:00 - 02:00		
02:00 - 03:00		
03:00 - 04:00		
04:00 - 05:00		
05:00 - 06:00		
06:00 - 07:00		
07:00 - 08:00		
08:00 - 09:00	86.3	
09:00 - 10:00	86.4	
10:00 - 11:00	86.4	
11:00 - 12:00	86.4	
12:00 - 13:00	86.5	
13:00 - 14:00	86.5	
14:00 - 15:00	86.6	
15:00 - 16:00	86.4	
16:00 - 17:00		
17:00 - 18:00		
18:00 - 19:00		
19:00 - 20:00		
20:00 - 21:00		
21:00 - 22:00		
22:00 - 23:00		
23:00 - 24:00		
Leq(8)*	86.4	
Lmax **	97.1	
Standard-8Hr	90 dB(A)	
Standard-Max	140 dB(A)	

Remark : \* Average time between 08:00-16:00

\*\* Maximum Sound Pressure Level between 08:00-16:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Sununta Sirawuttinanon)  
Technical Management Team



## Noise Monitoring Result : Working Noise

### MTR-SPRC PLC-Refinery

Location : Utility (During 41G103A-B)

Monitor Period : Aug 10, 2023

SLM Model : SCARLET ST-21D

Serial No : 820729

Site Operator : Mr. Watcharakan Pramakhate

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : Sep 12, 2022

SLM Reading / Adjust dB(A) : 93.8/0.0

Expire Date : Sep 11, 2023

Cal Sheet No.: CR-515-2023-121

Time	Equivalent Sound Pressure Level (dB(A))	
	Aug 10, 2023	
00:00 - 01:00		
01:00 - 02:00		
02:00 - 03:00		
03:00 - 04:00		
04:00 - 05:00		
05:00 - 06:00		
06:00 - 07:00		
07:00 - 08:00		
08:00 - 09:00	88.4	
09:00 - 10:00	88.4	
10:00 - 11:00	88.4	
11:00 - 12:00	88.3	
12:00 - 13:00	88.3	
13:00 - 14:00	88.3	
14:00 - 15:00	88.3	
15:00 - 16:00	88.4	
16:00 - 17:00		
17:00 - 18:00		
18:00 - 19:00		
19:00 - 20:00		
20:00 - 21:00		
21:00 - 22:00		
22:00 - 23:00		
23:00 - 24:00		
Leq(8)*	88.4	
Lmax **	90.7	
Standard-8Hr	90 dB(A)	
Standard-Max	140 dB(A)	

Remark : \* Average time between 08:00-16:00

\*\* Maximum Sound Pressure Level between 08:00-16:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Sununta Sirawuttinanon)  
Technical Management Team





## Noise Monitoring Result : Working Noise

### MTR-SPRC PLC-Refinery

Location : RFCCU (Near 17GM102A-B)  
 SLM Model : SCARLET ST-21D  
 Site Operator : Mr. Watcharakan Pramakhate

Monitor Period : Aug 10, 2023  
 Serial No : 820726


Calibrator Model : Cirrus CR:515  
 Calibration Ref dB(A) : 94.0  
 SLM Reading / Adjust dB(A) : 93.8/0.0  
 Cal Sheet No.: CR-515-2023-121

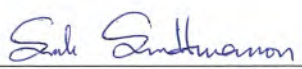
Serial No : 94296  
 Certified Date : Sep 12, 2022  
 Expire Date : Sep 11, 2023

Time	Equivalent Sound Pressure Level (dB(A))	
	Aug 10, 2023	
00:00 - 01:00		
01:00 - 02:00		
02:00 - 03:00		
03:00 - 04:00		
04:00 - 05:00		
05:00 - 06:00		
06:00 - 07:00		
07:00 - 08:00		
08:00 - 09:00	86.6	
09:00 - 10:00	86.3	
10:00 - 11:00	86.3	
11:00 - 12:00	86.3	
12:00 - 13:00	86.1	
13:00 - 14:00	86.2	
14:00 - 15:00	86.5	
15:00 - 16:00	86.6	
16:00 - 17:00		
17:00 - 18:00		
18:00 - 19:00		
19:00 - 20:00		
20:00 - 21:00		
21:00 - 22:00		
22:00 - 23:00		
23:00 - 24:00		
Leq(8)*	86.4	
Lmax **	88.3	
Standard-8Hr	90 dB(A)	
Standard-Max	140 dB(A)	

Remark : \* Average time between 08:00-16:00

\*\* Maximum Sound Pressure Level between 08:00-16:00

  
 (Miss Katesarin Vorradetwittaya)  
 Environmental Scientist

  
 (Miss Sununta Sirawuttinanon)  
 Technical Management Team





## Noise Monitoring Result : Working Noise

### MTR-SPRC PLC-Refinery

Location : CDU (Near 02GM102A)

Monitor Period : Nov 03, 2023

SLM Model : SCARLET ST-21D

Serial No : 820725

Site Operator : Miss Salisa Ainree

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : Sep 11, 2023

SLM Reading / Adjust dB(A) : 93.8/0.0

Expire Date : Sep 10, 2024

Cal Sheet No.: CR-515-2023-196

Time	Equivalent Sound Pressure Level (dB(A))	
	Nov 03, 2023	
00:00 - 01:00		
01:00 - 02:00		
02:00 - 03:00		
03:00 - 04:00		
04:00 - 05:00		
05:00 - 06:00		
06:00 - 07:00		
07:00 - 08:00		
08:00 - 09:00	85.5	
09:00 - 10:00	85.7	
10:00 - 11:00	85.5	
11:00 - 12:00	85.6	
12:00 - 13:00	85.6	
13:00 - 14:00	85.8	
14:00 - 15:00	85.7	
15:00 - 16:00	85.6	
16:00 - 17:00		
17:00 - 18:00		
18:00 - 19:00		
19:00 - 20:00		
20:00 - 21:00		
21:00 - 22:00		
22:00 - 23:00		
23:00 - 24:00		
Leq(8)*	85.6	
Lmax **	92.9	
Standard-8Hr	90 dB(A)	
Standard-Max	140 dB(A)	

Remark : \* Average time between 08:00-16:00

\*\* Maximum Sound Pressure Level between 08:00-16:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Sununta Sirawuttinanon)  
Technical Management Team



## Noise Monitoring Result : Working Noise

### MTR-SPRC PLC-Refinery

Location : NHTU (Near 08G102A-B)

Monitor Period : Nov 03, 2023

SLM Model : SCARLET ST-21D

Serial No : 820723

Site Operator : Miss Salisa Ainree

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : Sep 11, 2023

SLM Reading / Adjust dB(A) : 93.8/0.0

Expire Date : Sep 10, 2024

Cal Sheet No.: CR-515-2023-196

Time	Equivalent Sound Pressure Level (dB(A))	
	Nov 03, 2023	
00:00 - 01:00		
01:00 - 02:00		
02:00 - 03:00		
03:00 - 04:00		
04:00 - 05:00		
05:00 - 06:00		
06:00 - 07:00		
07:00 - 08:00		
08:00 - 09:00	87.6	
09:00 - 10:00	87.6	
10:00 - 11:00	87.6	
11:00 - 12:00	87.6	
12:00 - 13:00	87.8	
13:00 - 14:00	87.6	
14:00 - 15:00	87.6	
15:00 - 16:00	87.6	
16:00 - 17:00		
17:00 - 18:00		
18:00 - 19:00		
19:00 - 20:00		
20:00 - 21:00		
21:00 - 22:00		
22:00 - 23:00		
23:00 - 24:00		
Leq(8)*	87.6	
Lmax **	94.5	
Standard-8Hr	90 dB(A)	
Standard-Max	140 dB(A)	

Remark : \* Average time between 08:00-16:00

\*\* Maximum Sound Pressure Level between 08:00-16:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Sununta Sirawuttinanon)  
Technical Management Team



## Noise Monitoring Result : Working Noise

### MTR-SPRC PLC-Refinery

Location : RFCCU (Near 17GM102A-B)

Monitor Period : Nov 03, 2023

SLM Model : SCARLET ST-21D

Serial No : 820728

Site Operator : Miss Salisa Ainree

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : Sep 11, 2023

SLM Reading / Adjust dB(A) : 93.8/0.0

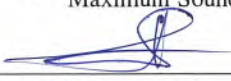
Expire Date : Sep 10, 2024

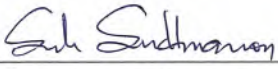
Cal Sheet No.: CR-515-2023-196

Time	Equivalent Sound Pressure Level (dB(A))	
	Nov 03, 2023	
00:00 - 01:00		
01:00 - 02:00		
02:00 - 03:00		
03:00 - 04:00		
04:00 - 05:00		
05:00 - 06:00		
06:00 - 07:00		
07:00 - 08:00		
08:00 - 09:00	89.5	
09:00 - 10:00	88.7	
10:00 - 11:00	88.7	
11:00 - 12:00	89.5	
12:00 - 13:00	88.7	
13:00 - 14:00	88.6	
14:00 - 15:00	89.1	
15:00 - 16:00	88.5	
16:00 - 17:00		
17:00 - 18:00		
18:00 - 19:00		
19:00 - 20:00		
20:00 - 21:00		
21:00 - 22:00		
22:00 - 23:00		
23:00 - 24:00		
Leq(8)*	88.9	
Lmax **	113.1	
Standard-8Hr	90 dB(A)	
Standard-Max	140 dB(A)	

Remark : \* Average time between 08:00-16:00

\*\* Maximum Sound Pressure Level between 08:00-16:00

  
 (Miss Katesarin Vorradetwittaya)  
 Environmental Scientist

  
 (Miss Sununta Sirawuttinanon)  
 Technical Management Team





## Noise Monitoring Result : Working Noise

### MTR-SPRC PLC-Refinery

Location : Utility (During 41G103A-B)

Monitor Period : Dec 21, 2023

SLM Model : SCARLET ST-21D

Serial No : 820722

Site Operator : Miss Wiraya Patchimboon

Calibrator Model : Cirrus CR:515

Serial No : 94296

Calibration Ref dB(A) : 94.0

Certified Date : Sep 11, 2023

SLM Reading / Adjust dB(A) : 93.8/0.0

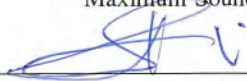
Expire Date : Sep 10, 2024

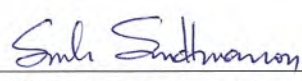
Cal Sheet No.: CR-515-2023-241

Time	Equivalent Sound Pressure Level (dB(A))	
	Dec 21, 2023	
00:00 - 01:00		
01:00 - 02:00		
02:00 - 03:00		
03:00 - 04:00		
04:00 - 05:00		
05:00 - 06:00		
06:00 - 07:00		
07:00 - 08:00	89.7	
08:00 - 09:00	89.8	
09:00 - 10:00	89.7	
10:00 - 11:00	90.1	
11:00 - 12:00	90.1	
12:00 - 13:00	89.8	
13:00 - 14:00	89.9	
14:00 - 15:00	89.8	
15:00 - 16:00		
16:00 - 17:00		
17:00 - 18:00		
18:00 - 19:00		
19:00 - 20:00		
20:00 - 21:00		
21:00 - 22:00		
22:00 - 23:00		
23:00 - 24:00		
Leq(8)*	89.9	
Lmax **	97.9	
Standard-8Hr	90 dB(A)	
Standard-Max	140 dB(A)	

Remark : \* Average time between 07:00-15:00

\*\* Maximum Sound Pressure Level between 07:00-15:00

  
 (Miss Katesarin Vorradetwittaya)  
 Environmental Scientist

  
 (Miss Sununta Sirawuttinanon)  
 Technical Management Team





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SECOT CO., LTD.

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TEL : +66(0) 2959-3600 FAX : +66(0) 2959-3535 E-mail : envserv@secot.co.th

### NOISE MEASUREMENT REPORT : NOISE DOSE

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REFERENCE NO.	: SPRC-E223005-Dose-Aug23 (Cert)/Aug23(5)
MEASUREMENT BY	: SECOT Co., Ltd.	INSTRUMENT	: Noise Dosimeter
MEASUREMENT DATE	: 10/08/2023	CALIBRATOR TYPE	: Pulsar 22R
MEASUREMENT LOCATION	: Process area	SERIAL NO.	: 79781
SITE OPERATOR	: Miss Salisa Ainree	CALIBRATOR REF.	: 1,000 Hz, 114 dB

USER NAME	AREA/PLANT	TIME	%DOSE	SOUND PRESSURE LEVEL (dB(A))	
				TWA (12-hr)	STANDARD*
Operator ID#110547	Area 1	07.09-19.00	72.4	81.8	83.0
	(CDU/VDU)				

(Miss Katesarin Vorradetwittaya)

Environmental Scientist

(Miss Sununta Sirawuttinanon)

Technical Management Team

- Remark :**
1. Reported analysis refers to submitted sample only.
  2. This report shall not be reproduced, except in full, without official approval.
  3. \*Notification of the Department of Labour Protection and Welfare, B.E.2561 (2018).
  4. TWA means Time Weighted Average.



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TEL : +66(0) 2959-3600 FAX : +66(0) 2959-3535 E-mail : envserv@secot.co.th

NOISE MEASUREMENT REPORT : NOISE DOSE

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REFERENCE NO.	: SPRC-E223005-Dose-Aug23 (Cert)/Aug23(9)
MEASUREMENT BY	: SECOT Co., Ltd.	INSTRUMENT	: Noise Dosimeter
MEASUREMENT DATE	: 24/08/2023	CALIBRATOR TYPE	: Cirrus RC 110A
MEASUREMENT LOCATION	: Process area	SERIAL NO.	: 95168
SITE OPERATOR	: Miss Salisa Ainree	CALIBRATOR REF.	: 1,000 Hz, 114 dB

USER NAME	AREA/PLANT	TIME	%DOSE	SOUND PRESSURE LEVEL (dB(A))	
				TWA (12-hr)	STANDARD*
Operator ID#110242	Area 2	06.57-18.57	31.3	78.2	83.0
(NHTU, DHTU, WCN, BSU)					

(Miss Katesarin Vorradetwittaya)

Environmental Scientist

(Miss Sununta Sirawuttinanon)

Technical Management Team

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NOISE MEASUREMENT REPORT : NOISE DOSE

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REFERENCE NO.	: SPRC-E223005-Dose-Aug23 (Cert)/Aug23(10)
MEASUREMENT BY	: SECOT Co., Ltd.	INSTRUMENT	: Noise Dosimeter
MEASUREMENT DATE	: 24/08/2023	CALIBRATOR TYPE	: Cirrus RC 110A
MEASUREMENT LOCATION	: Process area	SERIAL NO.	: 95168
SITE OPERATOR	: Miss Salisa Ainree	CALIBRATOR REF.	: 1,000 Hz, 114 dB

USER NAME	AREA/PLANT	TIME	%DOSE	SOUND PRESSURE LEVEL (dB(A))	
				TWA (12-hr)	STANDARD*
Operator ID#110784	Area 3 (SRU, Utility)	06.57-18.57	200.7	86.3	83.0
Operator ID#110494	Area 4 (RFCCU)	06.54-18.54	214.5	86.5	83.0

(Miss Katesarin Vorradetwittaya)

Environmental Scientist

(Miss Sununta Sirawuttinanon)

Technical Management Team

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TEL : +66(0) 2959-3600 FAX : +66(0) 2959-3535 E-mail : envserv@secot.co.th

### NOISE MEASUREMENT REPORT : NOISE DOSE

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REFERENCE NO.	: SPRC-E223005-Ns Dose(Cert)/Nov23(4)
MEASUREMENT BY	: SECOT Co., Ltd.	INSTRUMENT	: Noise Dosimeter
MEASUREMENT DATE	: 03/11/2023	CALIBRATOR TYPE	: Cirrus RC110A
MEASUREMENT LOCATION	: Process area	SERIAL NO.	: 95168
SITE OPERATOR	: Miss Salisa Ainree	CALIBRATOR REF.	: 1,000 Hz, 114 dB

USER NAME	AREA/PLANT	TIME	%DOSE	SOUND PRESSURE LEVEL (dB(A))	
				TWA (12-hr)	STANDARD*
Operator ID. : 110843	Area 1 (CDU/VDU)	07.33-19.33	38.9	79.2	83.0
Operator ID. : 110845	Area 2 (NHTU, DHTU, WCN, BSU)	07.38-19.38	39.8	79.3	83.0

(Miss Katesarin Vorradetwittaya)

Environmental Scientist

(Miss Sununta Sirawuttinanon)

Technical Management Team

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  4. TWA means Time Weighted Average.





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TEL : +66(0) 2959-3600 FAX : +66(0) 2959-3535 E-mail : envserv@secot.co.th

### NOISE MEASUREMENT REPORT : NOISE DOSE

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REFERENCE NO.	: SPRC-E223005-Ns Dose(Cert)/Nov23(9)
MEASUREMENT BY	: SECOT Co., Ltd.	INSTRUMENT	: Noise Dosimeter
MEASUREMENT DATE	: 28/11/2023	CALIBRATOR TYPE	: Cirrus RC110A
MEASUREMENT LOCATION	: Process area	SERIAL NO.	: 95168
SITE OPERATOR	: Miss Salisa Ainree	CALIBRATOR REF.	: 1,000 Hz, 114 dB

USER NAME	AREA/PLANT	TIME	%DOSE	SOUND PRESSURE LEVEL (dB(A))	
				TWA (12-hr)	STANDARD*
Operator ID. : 110640	Area 3 (SRU, Utility)	07.17-19.08	32.9	78.4	83.0

(Miss Katesarin Vorradetwittaya)

Environmental Scientist

(Miss Sununta Sirawuttinanon)

Technical Management Team

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  3. \*Notification of the Department of Labour Protection and Welfare, B.E.2561 (2018).
  4. TWA means Time Weighted Average.



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TEL : +66(0) 2959-3600 FAX : +66(0) 2959-3535 E-mail : envserv@secot.co.th

### NOISE MEASUREMENT REPORT : NOISE DOSE

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	REFERENCE NO.	: SPRC-E223005-Ns Dose(Cert)/Nov23(5)
MEASUREMENT BY	: SECOT Co., Ltd.	INSTRUMENT	: Noise Dosimeter
MEASUREMENT DATE	: 03/11/2023	CALIBRATOR TYPE	: Cirrus RC110A
MEASUREMENT LOCATION	: Process area	SERIAL NO.	: 95168
SITE OPERATOR	: Miss Salisa Ainree	CALIBRATOR REF.	: 1,000 Hz, 114 dB

USER NAME	AREA/PLANT	TIME	%DOSE	SOUND PRESSURE LEVEL (dB(A))	
				TWA (12-hr)	STANDARD*
Operator ID. : 110841	Area 4 (RFCCU)	07.38-19.38	111.2	83.7	83.0

(Miss Katesarin Vorradetwittaya)

Environmental Scientist

(Miss Sununta Sirawuttinanon)

Technical Management Team

- Remark :**
1. Reported analysis refers to submitted sample only.
  2. This report shall not be reproduced, except in full, without official approval.
  3. \*Notification of the Department of Labour Protection and Welfare, B.E.2561 (2018).
  4. TWA means Time Weighted Average.

ภาคผนวก จ

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ข้อมูลการตรวจเทียบเครื่องมือ  
(Calibration Data Sheets)



Airgas Specialty Gases  
Airgas USA, LLC  
600 Union Landing Road  
Cinnaminson, NJ 08077-0000  
Airgas.com

## CERTIFICATE OF ANALYSIS

### Grade of Product: EPA Protocol

Part Number:	E04NI99E15AC084	Reference Number:	82-401409170-1
Cylinder Number:	EB0102326	Cylinder Volume:	144.4 CF
Laboratory:	124 - Riverton (SAP) - NJ	Cylinder Pressure:	2015 PSIG
PGVP Number:	B52019	Valve Outlet:	660
Gas Code:	CO,NO,NOX,SO2,BALN	Certification Date:	Feb 05, 2019

Expiration Date: Feb 05, 2027

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS					
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
NOX	50.00 PPM	51.01 PPM	G1	+/- 0.9% NIST Traceable	01/28/2019, 02/05/2019
NITRIC OXIDE	50.00 PPM	50.86 PPM	G1	+/- 0.9% NIST Traceable	01/28/2019, 02/05/2019
SULFUR DIOXIDE	50.00 PPM	50.87 PPM	G1	+/- 1.0% NIST Traceable	01/28/2019, 02/05/2019
CARBON MONOXIDE	0.5000 %	0.5050 %	G1	+/- 0.7% NIST Traceable	01/31/2019
NITROGEN	Balance				

CALIBRATION STANDARDS					
Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	13060206	CC401947	4950 PPM CARBON MONOXIDE/NITROGEN	+/- 0.4%	Feb 15, 2019
PRM	12367	APEX1099237	9.82 PPM NITROGEN DIOXIDE/AIR	+/- 2.0%	Jun 02, 2017
NTRM	12010724	KAL004497	50.03 PPM NITRIC OXIDE/NITROGEN	+/- 0.8%	Mar 12, 2024
GMIS	1114201601	CC506710	4.971 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.0%	Nov 14, 2019
NTRM	14010327	KAL004376	49.08 PPM SULFUR DIOXIDE/NITROGEN	+/- 1.0%	Apr 17, 2024

The SRM, PRM or RGM noted above is only in reference to the GMIS used in the assay and not part of the analysis.

ANALYTICAL EQUIPMENT		
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Siemens Ultramat 6 J3-599 COHIGH	NDIR	Jan 18, 2019
Nicolet 6700 APW1100391 NO	FTIR	Jan 10, 2019
Nicolet 6700 APW1100391 NO2	FTIR	Jan 10, 2019
Nicolet 6700 APW1100391 SO2	FTIR	Jan 10, 2019

Triad Data Available Upon Request

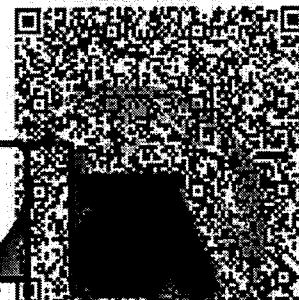
PERMANENT NOTES: PRODUCED IN ACCORDANCE WITH ISO17025 REQUIREMENTS

#### NOTES:

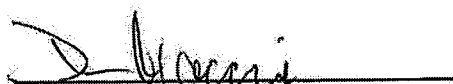
Gross Weight: 27806.3 grams

Net Weight: 4733.2 grams

This calibration std. has been certified in accordance with the May 2012 EPA Traceability Protocol Document EPA-600/R-12/531. All testing processes and measurements conform to the requirements of ISO/IEC 17025 and to Airgas ISO 9001:2008 and relate only to items identified on this certificate. All items are certified to be NIST Traceable with total uncertainty as detailed under Analytical Uncertainty. This document shall not be reproduced in full without written approval of the issuer.



TESTING CERT No. 3082.05

  
Approved for Release





## High Volume TSP & PM-10 Calibration Data Sheet

Calibration Location : SECOT Co.,Ltd. Calibration Date : Jan 9, 2023

Hi-Vol Pump No. : BH-005 Indicator No. : CM-01

Amb. Temp (°C) : 26 Press (mmHg) : 760

Calibration by : Mr.Punkawin K.

Plate	Indicate (X) ( cm. )	True H <sub>2</sub> O ( in. )	Actual Flow (Y) (cfm)	XY	X <sup>2</sup>	Remark
18	19.00	12.60	59.07	1,122.33	361.00	
13	15.40	9.90	52.68	811.27	237.16	
10	12.20	7.00	44.50	542.90	148.84	
7	7.60	4.90	37.44	284.54	57.76	
5	4.60	3.00	29.58	136.07	21.16	
Sum	58.80	37.40	223.27	2,897.11	825.92	

Calibrated by : Punkawin Approved by : Wittaya K.



## High Volume TSP & PM-10 Calibration Data Sheet

Calibration Location : SECOT Co.,Ltd. Calibration Date : Jan 9, 2023

Hi-Vol Pump No. : BH-016 Indicator No. : CM-01

Amb. Temp (°C) : 26 Press (mmHg) : 760

Calibration by : Mr.Punkawin K.

Plate	Indicate (X) ( cm. )	True H <sub>2</sub> O ( in. )	Actual Flow (Y) (cfm)	XY	X <sup>2</sup>	Remark
18	19.90	14.00	62.20	1,237.78	396.01	
13	16.00	11.00	55.46	887.36	256.00	
10	12.40	8.40	48.63	603.01	153.76	
7	8.00	5.40	39.24	313.92	64.00	
5	5.00	3.30	30.96	154.80	25.00	
Sum	61.30	42.10	236.49	3,196.87	894.77	

Calibrated by : Punkawin Approved by : Wittaya K.



## High Volume TSP & PM-10 Calibration Data Sheet

Calibration Location : SECOT Co.,Ltd. Calibration Date : Jan 9, 2023

Hi-Vol Pump No. : BH-004 Indicator No. : CM-01

Amb. Temp (°C) : 26 Press (mmHg) : 760

Calibration by : Mr.Punkawin K.

Plate	Indicate (X) ( cm. )	True H <sub>2</sub> O ( in. )	Actual Flow (Y) (cfm)	XY	X <sup>2</sup>	Remark
18	19.40	12.80	59.53	1,154.88	376.36	
13	15.20	10.00	52.94	804.69	231.04	
10	12.20	7.80	46.90	572.18	148.84	
7	7.80	4.90	37.44	292.03	60.84	
5	4.80	3.00	29.58	141.98	23.04	
Sum	59.40	38.50	226.39	2,965.77	840.12	

Calibrated by : Punkawin Approved by : Mr. Haya



## High Volume TSP & PM-10 Calibration Data Sheet

Calibration Location : SECOT Co.,Ltd. Calibration Date : Jan 12, 2023

Hi-Vol Pump No. : BH-014 Indicator No. : CM-01

Amb. Temp (°C) : 27 Press (mmHg) : 760

Calibration by : Mr.Nattachai C.

Plate	Indicate (X) ( cm. )	True H <sub>2</sub> O ( in. )	Actual Flow (Y) (cfm)	XY	X <sup>2</sup>	Remark
18	18.20	13.30	60.66	1,039.70	309.80	
13	14.80	10.40	53.96	748.30	196.00	
10	12.20	8.20	48.06	525.30	125.40	
7	7.80	5.20	38.53	277.40	51.80	
5	4.60	4.10	34.36	120.20	21.16	
Sum	57.60	41.20	235.57	2,710.90	704.16	

Calibrated by : Nattachai C. Approved by : Wattana H.





## High Volume TSP & PM-10 Calibration Data Sheet

Calibration Location : SECOT Co.,Ltd. Calibration Date : Jan 9, 2023

Hi-Vol Pump No. : BH-031 Indicator No. : CM-01

Amb. Temp (°C) : 26 Press (mmHg) : 760

Calibration by : Mr.Punkawin K.

Plate	Indicate (X) ( cm. )	True H <sub>2</sub> O ( in. )	Actual Flow (Y) (cfm)	XY	X <sup>2</sup>	Remark
18	20.00	13.10	60.21	1,204.20	400.00	
13	16.50	10.30	53.71	886.22	272.25	
10	13.00	8.00	47.48	617.24	169.00	
7	8.60	5.20	38.53	331.36	73.96	
5	5.00	3.10	30.04	150.20	25.00	
Sum	63.10	39.70	229.97	3,189.21	940.21	

Calibrated by : Punkawin Approved by : Wittaya K



## High Volume TSP & PM-10 Calibration Data Sheet

Calibration Location : SECOT Co.,Ltd. Calibration Date : Jan 11, 2023

Hi-Vol Pump No. : BH-034 Indicator No. : CM-01

Amb. Temp (°C) : 27 Press (mmHg) : 760

Calibration by : Mr.Nattachai C.

Plate	Indicate (X) ( cm. )	True H <sub>2</sub> O ( in. )	Actual Flow (Y) (cfm)	XY	X <sup>2</sup>	Remark
18	19.40	13.60	61.32	1,189.61	376.36	
13	15.80	10.90	55.21	872.32	249.64	
10	12.40	8.40	48.63	603.01	153.76	
7	8.00	5.40	39.24	313.92	64.00	
5	4.80	3.30	30.96	148.61	23.04	
Sum	60.40	41.60	235.36	3,127.47	866.80	

Calibrated by : Nattachai C. Approved by : Wittaya K.



# CONTROL UNIT CALIBRATION

(Metric units, mm)

Date 10 Jan 23

	Initial	Final	Average	
Barometric press, Pb	757	757	757	mmHg

## Dry Gas Meter Data

Console No. M50-08

Metering System ID

DGM Number 971415

DGM Model ES-110

Calibrated by : Montri P.

## Reference Dry Gas Meter Data

Serial No. 358794

Model S110

Correction factor (Yr) 1.0079

Last Calibration Date 9 Dec 22

Orifice manometer setting, ΔH mm H <sub>2</sub> O	Ref. DGM Volume V <sub>r</sub> , Liters	DGM Volume V <sub>m</sub> Liters	Temperature (°C)				Time Θ min	DGM Correction factor (Y)	ΔH@ mm
			Ref DGM T <sub>r</sub>	Dry Gas Meter					
				Inlet T <sub>i</sub>	Outlet T <sub>o</sub>	Avg T <sub>m</sub>			
12.5	100.0	98.5	25	25	24	24.5	8.43	1.0203	40.4451
25.0	100.0	100.1	25	25	24	24.5	6.08	1.0028	42.0902
50.0	100.0	99.2	25	25	24	24.5	4.33	1.0095	42.7141
76.0	100.2	98.7	25	25	24	24.5	3.57	1.0141	43.8087
100.0	100.0	98.7	25	25	24	24.5	3.57	1.0097	44.6653
150.0	100.1	96.8	25	25	24	24.5	2.57	1.0256	44.8662
Average								1.0137	43.0983

Approved by : Ladawan W.



## CONTROL UNIT CALIBRATION

### (Metric units, mm)

Date 16 Jan 23

	Initial	Final	Average	
Barometric press, Pb	759	759	759	mmHg

**Dry Gas Meter Data**

Console No. M50-09

Metering System ID

DGM Number 972135

DGM Model ES-110

Calibrated by : Montri P.

**Reference Dry Gas Meter Data**

Serial No. 358794

Model S110

Correction factor (Yr) 1.0079

Last Calibration Date 9 Dec 22

Orifice manometer setting, ΔH mm H <sub>2</sub> O	Ref. DGM Volume V <sub>r</sub> Liters	DGM Volume V <sub>m</sub> Liters	Temperature (°C)				Time ⊙ min	DGM Correction factor (Y)	ΔH@ mm
			Ref DGM T <sub>r</sub>	Dry Gas Meter					
				Inlet T <sub>i</sub>	Outlet T <sub>o</sub>	Avg T <sub>m</sub>			
12.5	100.3	101.9	25	25	24	24.5	9.72	0.9891	53.2869
25.0	100.0	101.6	25	25	24	24.5	6.50	0.9882	47.9400
50.0	100.1	100.5	25	25	24	24.5	4.80	0.9973	52.2127
76.0	100.1	99.3	25	25	24	24.5	3.72	1.0070	47.5062
100.0	100.3	99.0	25	25	24	24.5	3.72	1.0089	47.2038
150.0	100.3	99.0	25	25	24	24.5	2.58	1.0050	45.1359
Average								0.9992	48.8809

Approved by : Ladanah W.





## PITOT TUBE CALIBRATION

Calibration Location: SECOT

Calibration Date : 06-01-2023

Calibrated duct No.: 1

Calibration Standard Pitot tube data

Pitot No. : Std-01

Coefficient (Cp) : 1

Type S Pitot No. : PS20-02

Calibrated by : Mr. Montri P.

## A Side Calibration

Run No.	$\Delta P_{std}$ (mm H <sub>2</sub> O)	$\Delta P_s$ (mm H <sub>2</sub> O)	Cp(s)	Deviation, $\delta$ Cp(s) - Cp(A)
1	7.50	10.75	0.8353	0.0032
2	7.50	11.00	0.8257	-0.0064
3	7.50	10.75	0.8353	0.0032

C<sub>P(A),avg</sub> 0.8321

## B Side Calibration

Run No.	$\Delta P_{std}$ (mm H <sub>2</sub> O)	$\Delta P_s$ (mm H <sub>2</sub> O)	Cp(s)	Deviation, $\delta$ Cp(s) - Cp(B)
1	7.50	10.75	0.8353	-0.0033
2	7.50	10.50	0.8452	0.0066
3	7.50	10.75	0.8353	-0.0033

C<sub>P(B),avg</sub> 0.8386

| CP(A)-CP(B) | = 0.0065

C<sub>P(Avg)</sub> = 0.8353

Approved by : Ladawan W.

\*\*\*  $\delta$  must be  $\leq 0.01$  for the test to be acceptable \*\*\*  
 \*\*\* | Cp(A)-Cp(B) | must also be  $< 0.01$  if average of Cp(A) and Cp(B) is to be used \*\*\*



## PITOT TUBE CALIBRATION

Calibration Location: SECOT

Calibration Date : 06-01-2023

Calibrated duct No.: 1

Calibration Standard Pitot tube data

Pitot No. : Std-01

Coefficient (Cp) : 1

Type S Pitot No. : PS25-01

Calibrated by : Mr. Montri P.

## A Side Calibration

Run No.	$\Delta P_{std}$ (mm H <sub>2</sub> O)	$\Delta P_s$ (mm H <sub>2</sub> O)	Cp(s)	Deviation, $\delta$ Cp(s) - Cp(A)
1	7.50	10.55	0.8431	0.0026
2	7.50	10.75	0.8353	-0.0053
3	7.50	10.55	0.8431	0.0026

 $C_{P(A),avg}$  0.8405

## B Side Calibration

Run No.	$\Delta P_{std}$ (mm H <sub>2</sub> O)	$\Delta P_s$ (mm H <sub>2</sub> O)	Cp(s)	Deviation, $\delta$ Cp(s) - Cp(B)
1	7.50	10.50	0.8452	0.0033
2	7.50	10.75	0.8353	-0.0066
3	7.50	10.50	0.8452	0.0033

 $C_{P(B),avg}$  0.8419

 $|CP(A) - CP(B)| = 0.0013$ 
 $C_{P(Avg)} = 0.8412$ 

Approved by : Ladawan W.

\*\*\*  $\delta$  must be  $\leq 0.01$  for the test to be acceptable \*\*\*\*\*\*  $|Cp(A) - Cp(B)|$  must also be  $< 0.01$  if average of Cp(A) and Cp(B) is to be used \*\*\*



**ELECTRICAL AND ELECTRONICS INSTITUTE  
FOUNDATION FOR INDUSTRIAL DEVELOPMENT**

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Phraek Sa, Mueang Samut Prakan, Samut Prakan 10280

Tel: +66 2709 4860 Fax: +66 2324 0917



Certificate No.: CP20220368EA

Operation No.: CP2022120011

## Certificate of Calibration

Equipment: Sound Calibrator

Manufacturer: Cirrus Research Plc

Model/Type: CR:515

Serial No.: 94296

ID No.: -

Customer: SECOT Co.,Ltd.

Address: 239 Rimklongprapa Rd., Bangsue,  
Bangkok 10800 Thailand

Received Date: 14 December 2022

Calibrated Date: 20 December 2022

Issued Date: 23 December 2022

Calibrated by: Ms. Juntaporn Kunhakom

Approved by: \_\_\_\_\_

( Mr. Sittichai Swaksuriyawong )  
Group Manager

This report was prepared electronically using applicable electronic signature. Printing or copy of file are considered as a copy of the document.

The reported uncertainty of measurement was based on standard uncertainty multiplied by a coverage factor ( $k$ ) providing a level of confidence of approximately 95%. This certificate may not be reproduced other than in full except with the prior written approval of the Electrical and Electronics Institute, Foundation for Industrial Development.

Certificate No.: CP20220368EA

### Calibration Report

Equipment: Sound Calibrator  
Manufacturer: Cirrus Research Plc  
Model/Type: CR:515  
Serial No.: 94296  
ID No.: -  
Ambient Temperature: ( 23 ± 2 ) °C  
Relative Humidity: ( 50 ± 15 ) %  
Pressure: (101.3 ± 1.5) kPa

Method of Calibration :-

IEC 60942:2017

#### Condition of this result of calibration

1. Reference standards instrument :-

Instrument	Model	Serial No.	Cert. No.	Due Date
1) Standard microphone	4180	2661000	AA-1020-22	14 June 2023
2) Waveform Generator	33511B	MY52302264	CK20220058EA	19 June 2023
3) Audio Analyzing DMM	2015-P	4079144	E1U221042	16 March 2023
4) Pressure humidity and Temperature Transmitter	PTU301	F0640002	CL1-P220024 CD20220165EA	17 March 2023 24 July 2023

2. This result of calibration was found accurate as shown on date and place of calibration only.

3. This certification is traceable to the international system of unit maintained at :-

Reference standards instrument for Acoustic function

- National Institute of Metrology (Thailand)

Reference standards instrument for Electrical function

- Electrical and Electronics Institute; NSC Accredited Calibration No.0119

#### Result of Calibration:-

1. Function : Sound pressure level

Normal Frequency (Hz)	Specified Sound Pressure level (dB)	Measured value (dB)	Deviated value <sup>[1]</sup> (dB)	Acceptance limit <sup>[3]</sup> (dB)
1000	94	93.90	-0.10	±0.25

2. Function : Frequency

Normal Sound Pressure level (dB)	Specified Frequency (Hz)	Measured value (Hz)	Deviated value <sup>[2]</sup> (%)	Acceptance limit <sup>[3]</sup> (%)
94	1000	1000.3	0.0	±0.7



Certificate No.: CP20220368EA

### Calibration Report

#### 3. Function : Total distortion + noise

Normal Sound Pressure level (dB)	Normal Frequency (Hz)	Measured value <sup>[4]</sup> (%)	Acceptance limit <sup>[5]</sup> (%)
94	1000	0.9	2.5

#### Uncertainty of measurement

Function	Uncertainty	Maximum-permitted uncertainty of measurement
Sound pressure level	0.10 dB	0.15 dB
Frequency	0.10 %	0.20 %
Total distortion + noise	0.40 %	0.50 %

- Note:
- [1] The deviated value is the absolute value of the difference between the measured value and the corresponding specified sound pressure level.
  - [2] The deviated value is the absolute value of the difference in percent between the measured value and the corresponding specified frequency.
  - [3] The acceptance limit is for the deviated value.
  - [4] The measured value is the total distortion + noise, measured over the frequency range from 20 Hz to 20 kHz.
  - [5] The acceptance limit is for the Measured value.

Remarks: 1. Acceptance limit was IEC 60942:2017 Class 1.  
2. The coverage factor  $k = 2.00$

-- End of Report --



## NOISE DOSE METER CALIBRATION

Calibration Location: SECOT

Calibration Date: Aug 10, 23

### ACOUSTIC CALIBRATOR

Brand	Model	Serial No.	Frequency (Hz)	Ref.Calibrated (dB)	Eff.Calibrated (dB)
Cirrus	CR:515	94296	1000.00	94.0	93.8

No.	Brand	Model	Serial No.	Reading (dB)	dB Adjust
1	SCARLET	ST-21D	820722	93.8	0.0
2	SCARLET	ST-21D	820723	93.8	0.0
4	SCARLET	ST-21D	820725	93.8	0.0
5	SCARLET	ST-21D	820726	93.8	0.0
6	SCARLET	ST-21D	820727	93.8	0.0
7	SCARLET	ST-21D	820728	93.8	0.0
8	SCARLET	ST-21D	820729	93.8	0.0
9	SCARLET	ST-21D	820730	93.8	0.0

Calibrated by :

Approved by :



## SOUND LEVEL METER CALIBRATION

Calibration Location:

SECOT

Calibration Date:

Nov 16, 23

### ACOUSTIC CALIBRATOR

Brand	Model	Serial No.	Frequency (Hz)	Ref.Calibrated (dB)	Eff.Calibrated (dB)
Cirrus	CR:515	94296	1000.00	94.0	93.7

No.	Brand	Model	Serial No.	Reading (dB)	dB Adjust
14	Cirrus	CR162B	G300709	93.4	0.3
15	Cirrus	CR162B	G300769	93.7	0.0
16	Cirrus	CR162B	G300833	93.7	0.0
17	Cirrus	CR162B	G300846	93.7	0.0
23	Cirrus	CR162B	G301027	93.7	0.0
40	Cirrus	CR162B	G302740	93.4	0.3
41	Cirrus	CR162B	G302737	93.4	0.3
42	Cirrus	CR162B	G302738	93.6	0.1
48	Cirrus	CR162B	G302237	93.4	0.3
50	Cirrus	CR162B	G302333	93.4	0.3

Calibrated by :

Approved by :

Preeda S.



## SOUND LEVEL METER CALIBRATION

Calibration Location:

SECOT

Calibration Date:

Nov 3, 23

### ACOUSTIC CALIBRATOR

Brand	Model	Serial No.	Frequency (Hz)	Ref.Calibrated (dB)	Eff.Calibrated (dB)
Cirrus	CR:515	94296	1000.00	94.0	93.8

No.	Brand	Model	Serial No.	Reading (dB)	dB Adjust
1	SCARLET	ST-21D	820722	93.8	0.0
2	SCARLET	ST-21D	820723	93.8	0.0
4	SCARLET	ST-21D	820725	93.8	0.0
6	SCARLET	ST-21D	820727	93.8	0.0
7	SCARLET	ST-21D	820728	93.8	0.0
10	SCARLET	ST-21D	820731	93.8	0.0

Calibrated by :

Approved by :





**ELECTRICAL AND ELECTRONICS INSTITUTE  
FOUNDATION FOR INDUSTRIAL DEVELOPMENT**

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Phraek Sa, Mueang Samut Prakan, Samut Prakan 10280

Tel: +66 2709 4860 Fax: +66 2324 0917



NSC-TISI-TIS 17025  
CALIBRATION 0119

Certificate No.: CP20230033EA

Operation No.: CP2023010024

## Certificate of Calibration

Equipment: Sound Calibrator

Manufacturer: RION

Model/Type: NC-74

Serial No.: 34283648

ID No.: -

Customer: SECOT Co.,Ltd.

Address: 239 Rimklongprapa Rd., Bangsue,  
Bangkok 10800 Thailand

Received Date: 10 January 2023

Calibrated Date: 13 January 2023

Issued Date: 16 January 2023

Calibrated by: Ms. Juntaporn Kunhakom

Approved by: \_\_\_\_\_

( Mr. Sittichai Swaksuriyawong )

Group Manager

This report was prepared electronically using applicable electronic signature. Printing or copy of file are considered as a copy of the document.

The reported uncertainty of measurement was based on standard uncertainty multiplied by a coverage factor ( $k$ ) providing a level of confidence of approximately 95%. This certificate may not be reproduced other than in full except with the prior written approval of the Electrical and Electronics Institute, Foundation for Industrial Development.

Certificate No.: CP20230033EA

### Calibration Report

Equipment: Sound Calibrator  
Manufacturer: RION  
Model/Type: NC-74  
Serial No.: 34283648  
ID No.: -  
Ambient Temperature: ( 23 ± 2 ) °C  
Relative Humidity: ( 50 ± 15 ) %  
Pressure: (101.3 ± 1.5) kPa

Method of Calibration :-

IEC 60942:2017

#### Condition of this result of calibration

1. Reference standards instrument :-

Instrument	Model	Serial No.	Cert. No.	Due Date
1) Standard microphone	4180	2661000	AA-1020-22	14 June 2023
2) Waveform Generator	33511B	MY52302264	CK20220058EA	19 June 2023
3) Audio Analyzing DMM	2015-P	4079144	E1U221042	16 March 2023
4) Pressure humidity and Temperature Transmitter	PTU301	F0640002	CL1-P220024 CD20220165EA	17 March 2023 24 July 2023

2. This result of calibration was found accurate as shown on date and place of calibration only.

3. This certification is traceable to the international system of unit maintained at :-

Reference standards instrument for Acoustic function

- National Institute of Metrology (Thailand)

Reference standards instrument for Electrical function

- Electrical and Electronics Institute; NSC Accredited Calibration No.0119

#### Result of Calibration:-

1. Function : Sound pressure level

Normal	Specified Sound	Measured value	Deviated value <sup>[1]</sup>	Acceptance limit <sup>[3]</sup>
Frequency (Hz)	Pressure level (dB)	(dB)	(dB)	(dB)
1000	94	94.24	0.24	±0.25

2. Function : Frequency

Normal Sound	Specified Frequency	Measured value	Deviated value <sup>[2]</sup>	Acceptance limit <sup>[3]</sup>
Pressure level (dB)	(Hz)	(Hz)	(%)	(%)
94	1000	1003.0	0.3	±0.7

Certificate No.: CP20230033EA

### Calibration Report

#### 3. Function : Total distortion + noise

Normal Sound Pressure level (dB)	Normal Frequency (Hz)	Measured value <sup>[4]</sup> (%)	Acceptance limit <sup>[5]</sup> (%)
94	1000	1.3	2.5

#### Uncertainty of measurement

Function	Uncertainty	Maximum-permitted uncertainty of measurement
Sound pressure level	0.10 dB	0.15 dB
Frequency	0.10 %	0.20 %
Total distortion + noise	0.40 %	0.50 %

- Note:
- [1] The deviated value is the absolute value of the difference between the measured value and the corresponding specified sound pressure level.
  - [2] The deviated value is the absolute value of the difference in percent between the measured value and the corresponding specified frequency.
  - [3] The acceptance limit is for the deviated value.
  - [4] The measured value is the total distortion + noise, measured over the frequency range from 20 Hz to 20 kHz.
  - [5] The acceptance limit is for the Measured value.
- Remarks:
- 1. Using the 1/2-inch microphone adaptor NC-74-002.
  - 2. Acceptance limit was IEC 60942:2017 Class 1.
  - 3. The coverage factor  $k = 2.00$

- - End of Report - -



## SOUND LEVEL METER CALIBRATION

Calibration Location:

SECOT

Calibration Date:

Nov 16, 23

### ACOUSTIC CALIBRATOR

Brand	Model	Serial No.	Frequency (Hz)	Ref.Calibrated (dB)	Eff.Calibrated (dB)
RION	NC-74	34283648	1000.00	94.0	94.0

No.	Brand	Model	Serial No.	Reading (dB)	dB Adjust
56	RION	NL-21	00187511	93.5	0.5

Calibrated by :

Approved by :

Preeda S.





## SOUND LEVEL METER CALIBRATION

Calibration Location:

SECOT

Calibration Date:

Dec 21, 23

### ACOUSTIC CALIBRATOR

Brand	Model	Serial No.	Frequency (Hz)	Ref.Calibrated (dB)	Eff.Calibrated (dB)
Cirrus	CR:515	94296	1000.00	94.0	93.8

No.	Brand	Model	Serial No.	Reading (dB)	dB Adjust
1	SCARLET	ST-21D	820722	93.8	0.0

Calibrated by :

Approved by :

# CERTIFICATE OF CALIBRATION

ISSUED BY                      Noisemeters

DATE OF ISSUE              28 April 2023              CERTIFICATE NUMBER 191319

**NoiseMeters**

NoiseMeters  
Acoustic House  
Bridlington Road  
Hunmanby  
YO14 0PH  
United Kingdom  
www.noisemeters.com

Page 1 of 1

Test engineer:  
Rebecca Thomas  
Electronically signed:



## doseBadge Reader

### Instrument

Manufacturer:    Pulsar Instruments Plc  
Model Number:    Model 22R

Serial Number:    79781  
Notes:

### Calibration Procedure

The tests were carried out in accordance with the requirements of IEC 60942:2003 where applicable.

Date of Calibration:    26 April 2023

### Functionality Results

Function	Result
Keypad	Pass
Battery Power	Pass
Display	Pass
Communication	Pass
2 way IR link	Pass
Clock	Pass

### Calibration Results

	Level (dB)	Frequency (Hz)	Distortion (% THD + Noise)
Result	114.00	999.0	0.47
Uncertainty	$\pm 0.11$	$\pm 0.14$	$\pm 0.10$
Tolerances	$\pm 0.60$	$\pm 2.00$	$\pm 4.00$

No adjustments were made during this calibration.

### Environmental Conditions

Pressure:            101.00 kPa  
Temperature:       22.4 °C  
Humidity:           33.7 %

### Notes

This certificate provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory. The results within this certificate relate only to the items calibrated. The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor  $k=2$ , providing a coverage probability of approximately 95%.



## NOISE DOSE METER CALIBRATION

Calibration Location:

SECOT

Calibration Date:

Aug 10, 23

### ACOUSTIC CALIBRATOR

Brand	Model	Serial No.	Calibrated (dB)	Frequency (Hz)
PULSAR	22R	79781	114.00	1000

No.	Brand	Model	Serial No.	Reading (dB)	dB Adjust
1	Pulsar	22	PB617	114.7	-0.7
2	Pulsar	22	PB644	114.7	-0.7

Calibrated by :

Approved by :

# CERTIFICATE OF CALIBRATION

ISSUED BY Noisemeters

DATE OF ISSUE 16 March 2023 CERTIFICATE NUMBER 189327

**NoiseMeters**

NoiseMeters  
Acoustic House  
Bridlington Road  
Hunmanby  
YO14 0PH  
United Kingdom  
www.noisemeters.com

Page 1 of 1

Test engineer:  
Nigel Smith  
Electronically signed:



## doseBadge Reader

### Instrument

Manufacturer: Cirrus Research plc  
Model Number: RC:110A

Serial Number: 95168  
Notes:

### Calibration Procedure

The tests were carried out in accordance with the requirements of IEC 60942:2003 where applicable.

Date of Calibration: 16 March 2023

### Functionality Results

Function	Result
Keypad	Pass
Battery Power	Pass
Display	Pass
Communication	Pass
2 way IR link	Pass
Clock	Pass

### Calibration Results

	Level (dB)	Frequency (Hz)	Distortion (% THD + Noise)
Initial	113.90	999.3	0.61
Adjusted	114.00	999.2	0.61
Uncertainty	± 0.11	± 0.14	± 0.10
Tolerances	± 0.60	± 2.00	± 4.00

### Environmental Conditions

Pressure: 99.27 kPa  
Temperature: 23.3 °C  
Humidity: 37.6 %

### Notes

This certificate provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory. The results within this certificate relate only to the items calibrated. The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor  $k=2$ , providing a coverage probability of approximately 95%.





## NOISE DOSE METER CALIBRATION

Calibration Location:

SECOT

Calibration Date:

Aug 24, 23

### ACOUSTIC CALIBRATOR

Brand	Model	Serial No.	Calibrated (dB)	Frequency (Hz)
CIRRUS	RC 110A	95168	114.00	1000

No.	Brand	Model	Serial No.	Reading (dB)	dB Adjust
1	Cirrus	CR110A	CB1041	113.9	0.1

Calibrated by :

Approved by :



## NOISE DOSE METER CALIBRATION

Calibration Location:

SECOT

Calibration Date:

Aug 24, 23

### ACOUSTIC CALIBRATOR

Brand	Model	Serial No.	Calibrated (dB)	Frequency (Hz)
CIRRUS	RC 110A	95168	114.00	1000

No.	Brand	Model	Serial No.	Reading (dB)	dB Adjust
1	Cirrus	CR110A	CB1042	114.1	-0.1
2	Cirrus	CR110A	CB1043	114.0	0.0

Calibrated by :

Approved by :



## NOISE DOSE METER CALIBRATION

Calibration Location:

SECOT

Calibration Date:

Nov 3, 23

### ACOUSTIC CALIBRATOR

Brand	Model	Serial No.	Calibrated (dB)	Frequency (Hz)
CIRRUS	RC 110A	95168	114.00	1000

No.	Brand	Model	Serial No.	Reading (dB)	dB Adjust
1	Cirrus	CR110A	CB1052	113.6	0.4
2	Cirrus	CR110A	CB1053	114.1	-0.1
3	Cirrus	CR110A	CB1054	114.0	0.0
4	Cirrus	CR110A	CB1055	114.0	0.0
5	Cirrus	CR110A	CB1056	114.2	-0.2

Calibrated by :

Approved by :



## NOISE DOSE METER CALIBRATION

Calibration Location: SECOT

Calibration Date: Nov 28, 23

### ACOUSTIC CALIBRATOR

Brand	Model	Serial No.	Calibrated (dB)	Frequency (Hz)
CIRRUS	RC 110A	95168	114.00	1000

No.	Brand	Model	Serial No.	Reading (dB)	dB Adjust
1	Cirrus	CR110A	CB1052	113.7	0.3
2	Cirrus	CR110A	CB1053	113.5	0.5

Calibrated by :

Approved by :



ภาคผนวก จ

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หนังสืออนุญาตขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน  
จากกรมโรงงานอุตสาหกรรม



ที่ อก ๐๓๑๐(๑)/ ๑๑ ๐๑ ๖

กรมโรงงานอุตสาหกรรม  
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท  
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๒ ๐ กรกฎาคม ๒๕๖๖

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท ซีคอต จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน  
ลงวันที่ ๗ เมษายน ๒๕๖๖

- สิ่งที่ส่งมาด้วย ๑. รายชื่อผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๑ แผ่น  
๒. รายชื่อเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๑ แผ่น  
๓. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๙ แผ่น

ตามหนังสือที่อ้างถึง บริษัท ซีคอต จำกัด ขอต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๒๓๙ สถานที่ตั้งเลขที่ ๒๓๙ ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพมหานคร ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท ซีคอต จำกัด ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

- ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๑๐ ราย ตามสิ่งที่ส่งมาด้วย ๑  
ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๓๘ ราย ตามสิ่งที่ส่งมาด้วย ๒  
ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย น้ำใต้ดิน อากาศเสีย สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว และดิน ตามสิ่งที่ส่งมาด้วย ๓

หนังสือฉบับนี้จะหมดอายุในวันที่ ๒ พฤษภาคม ๒๕๖๙ หากประสงค์จะต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อกรมโรงงานอุตสาหกรรมภายใน ๓๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ซึ่งคำขอต่ออายุดังกล่าวขอรับได้ที่กรมโรงงานอุตสาหกรรม ทั้งนี้ สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ที่หน้าเว็บไซต์กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายประสม ดำรงพงษ์)

กองวิจัยและเตือนภัยมลพิษโรงงาน  
กลุ่มมาตรฐานวิธีวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ  
โทร. ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕  
โทรสาร ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๙๙  
ไปรษณีย์อิเล็กทรอนิกส์ saraban@diw.mail.go.th



“อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว”



สิ่งที่ส่งมาด้วย ๑

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท ซีคอต จำกัด

เลขทะเบียน ๖-๒๓๙

ที่ อก ๐๓๑๐(๑)/ ๑๑ ๐๑ ๖

ลงวันที่ ๒ ๐ กรกฎาคม ๒๕๖๖

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๑๐ ราย

- ๑) นายขรรชัย เกรียงไกรอุดม  
๒) นางสมฤดี เกรียงไกรอุดม  
๓) นางสาวรยา ทิพริกซ์  
๔) นางสาวเชมซุดา อินทร์ศร  
๕) นางสาวปริดา สมใจ  
๖) นางสาวอริญญา มาตา  
๗) นางสาวลดาวัลย์ วงศ์เจริญ  
๘) นางสาวณัฏรณ เกตะวันดี  
๙) นางสาวนริสา ภูวสรเพ็ชญ์  
๑๐) นางสาวศิริวรรณ นิมสง่า

- ทะเบียนเลขที่ ๖-๒๓๙-ค-๐๐๐๒  
ทะเบียนเลขที่ ๖-๒๓๙-ค-๐๐๐๓  
ทะเบียนเลขที่ ๖-๒๓๙-ค-๐๐๐๔  
ทะเบียนเลขที่ ๖-๒๓๙-ค-๐๐๐๕  
ทะเบียนเลขที่ ๖-๒๓๙-ค-๐๐๐๖  
ทะเบียนเลขที่ ๖-๒๓๙-ค-๐๐๐๗  
ทะเบียนเลขที่ ๖-๒๓๙-ค-๐๐๐๘  
ทะเบียนเลขที่ ๖-๒๓๙-ค-๐๐๐๙  
ทะเบียนเลขที่ ๖-๒๓๙-ค-๐๐๑๐  
ทะเบียนเลขที่ ๖-๒๓๙-ค-๐๐๑๑

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท ชีคอต จำกัด

เลขทะเบียน ๖-๒๓๙

ที่ ออก ๐๓๑๐(๑)/ ๑๑ ๐๑ ๖

ลงวันที่ ๒๐ กรกฎาคม ๒๕๖๖

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๓๘ ราย

๑) นางสาวสุภาพร สุนทร	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๐๑
๒) นางสาวสุธาทิพย์ เทียนเคียว	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๐๓
๓) นางสาวสุนันทา ศิริคุณานนท์	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๐๔
๔) นายบวร ศิขัยยะ	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๐๕
๕) นางสาวเกศรินทร์ วรเศรษฐยา	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๐๖
๖) นายอนันต์ วัฒนินา	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๐๗
๗) นายชัชพร วัฒนประเสริฐ	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๐๘
๘) นางสาวศศิธร พรหมประเสริฐ	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๐๙
๙) นายทัศนัย ภูทอง	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๑๐
๑๐) นางสาวอริยา คณิศรานนท์	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๑๑
๑๑) นางสาวสิริวรรณ แก้วสิงห์	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๑๒
๑๒) นางสาวปัทมาวรรณ สุพรรณโกวิท	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๑๓
๑๓) นางสาวกัญญา เจริญเชื้อ	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๑๔
๑๔) นายวิเศษศักดิ์ ประทุมมา	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๑๕
๑๕) นายชอง เมฆวิบูล	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๑๖
๑๖) นางสาวกฤษณา จันทน	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๑๗
๑๗) นางสาวพรหมมา บุตรธรรม	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๑๘
๑๘) นางสาววชิระ อานเสียว	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๑๙
๑๙) นายธนโชติ ช่างลือ	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๒๐
๒๐) นางสาวพัชรา สมานรัตน์	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๒๑
๒๑) นางสาวจุฑาวิคน์ แจ่มเรือน	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๒๒
๒๒) นางสาวจณิสตา กุ้ยอ่อน	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๒๓
๒๓) นายกิตติพงศ์ ณะกิจสุข	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๒๔
๒๔) นายจิรวัฒน์ โคตรคำหาญ	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๒๕
๒๕) นายชนนพล อัครผล	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๒๖
๒๖) นางสาวทิพย์สุดา วรรณการ	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๒๗
๒๗) นายสิทธิชัย สว่างวงศ์ไชย	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๒๘
๒๘) นายพิษณุ สีนามเพ็ง	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๒๙
๒๙) นายวันชัย ขอบท่ากิจ	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๓๐
๓๐) นายอนุชาติ ตัวนแสง	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๓๑
๓๑) นายณัฐชัย ไชยโคตร	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๓๒
๓๒) นายณัฐดนัย กฤษณะโสม	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๓๓
๓๓) นายศุภชัย สุขใหม่	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๓๔
๓๔) นายรอมฎอน เหลี่ยมมาม	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๓๕
๓๕) นางสาวสุภาวดี บัวแก้ว	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๓๖
๓๖) นางสาวมาเรียณี ฮานว	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๓๗
๓๗) นางสาววิระยา บัณฑิตบุรณ	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๓๘
๓๘) นางสาวกสิชา อินริย์	ทะเบียนเลขที่ ๖-๒๓๙-๖-๐๐๓๙

3/3/21

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท ชีคอต จำกัด

เลขทะเบียน ๖-๒๓๙

ที่ ออก ๐๓๑๐(๑)/ ๑๑ ๐๑ ๖

ลงวันที่ ๒๐ กรกฎาคม ๒๕๖๖

ขอขยายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๕๕ รายการ

น้ำเสีย จำนวน 45 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
2	Arsenic	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
3	Barium	1) Digestion, Direct Nitrous Oxide-Acetylene Flame Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
4	α-BHC	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
5	β-BHC	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
6	δ-BHC	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
7	γ-BHC	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
8	Biochemical Oxygen Demand	1) 5-Day BOD Test, Azide Modification Method <sup>(4)</sup> 2) 5-Day BOD Test, Membrane Electrode Method <sup>(4)</sup>
9	Cadmium	1) Digestion, Direct Air-Acetylene Flame Method <sup>(4)</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>(4)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
10	Chemical Oxygen Demand	1) Open Reflux, Titrimetric method <sup>(4)</sup> 2) Closed Reflux, Colorimetric method <sup>(4)</sup> 3) Closed Reflux, Titrimetric Method <sup>(4)</sup>
11	Chlordane	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
12	Chromium	1) Digestion, Direct Air-Acetylene Flame Method <sup>(4)</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>(4)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
13	Color	ADMI Weighted-Ordinate Spectrophotometric Method <sup>(4)</sup>
14	Copper	1) Digestion, Direct Air-Acetylene Flame Method <sup>(4)</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>(4)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
15	Cyanide	Distillation, Colorimetric method <sup>(4)</sup>
16	4,4'-DDD	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>

17 4,4'-DDE...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
17	4,4'-DDE	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
18	4,4'-DDT	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
19	Dieldrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
20	Endosulfan I	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
21	Endosulfan II	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
22	Endosulfan Sulfate	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
23	Endrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
24	Endrin Aldehyde	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>

25 Formaldehyde...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
25	Formaldehyde	Distillation, Colorimetric Method <sup>(3)</sup>
26	Free Chlorine	1) Iodometric Method <sup>(4)</sup> 2) DPD Colorimetric Method <sup>(4)</sup>
27	Heptachlor	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
28	Heptachlor-epoxide	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
29	Hexavalent Chromium	1) Colorimetric Method <sup>(4)</sup> 2) Extraction, Air-Acetylene Flame Method <sup>(4)</sup>
30	Lead	1) Digestion, Direct Air-Acetylene Flame Method <sup>(4)</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>(4)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
31	Manganese	1) Digestion, Direct Air-Acetylene Flame Method <sup>(4)</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>(4)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
32	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(4)</sup>
33	Methoxychlor	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
34	Nickel	1) Digestion, Direct Air-Acetylene Flame Method <sup>(4)</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>(4)</sup> 3) Digestion...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
		3) Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
35	Oil & Grease	1) Liquid-Liquid, Partition-Gravimetric Method <sup>(4)</sup> 2) Soxhlet Extraction Method <sup>(4)</sup>
36	pH	Electrometric Method <sup>(4)</sup>
37	Phenols	1) Distillation, Chloroform Extraction Method <sup>(4)</sup> 2) Distillation, Direct Photometric Method <sup>(4)</sup>
38	Selenium	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(4)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>
39	Sulfide	1) Iodometric method <sup>(4)</sup> 2) Methylene blue method <sup>(4)</sup>
40	Temperature	Laboratory and Field Methods <sup>(4)</sup>
41	Total Dissolved Solids	Dried at 180 °C <sup>(4)</sup>
42	Total Kjeldahl Nitrogen	1) Macro Kjeldahl Method <sup>(4)</sup> 2) Semi-Micro Kjeldahl Method <sup>(4)</sup>
43	Total Suspended Solids	Dried at 103-105 °C <sup>(4)</sup>
44	Trivalent Chromium	1) Digestion, Direct Air-Acetylene Flame Method; Colorimetric Method; Calculation <sup>(4)</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method; Colorimetric Method; Calculation <sup>(4)</sup> 3) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation <sup>(4)</sup>
45	Zinc	1) Digestion, Direct Air-Acetylene Flame Method <sup>(4)</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>(4)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(4)</sup>



น้ำใต้ดิน จำนวน 125 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
2	Acetone	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
3	Aldrin	1) Liquid-Liquid Extraction, Gas Chromatographic/ Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
4	Anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
5	Antimony	Digestion, Inductively Coupled Plasma Spectrometric Method <sup>(4)</sup>
6	Arsenic	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(4)</sup> 2) Digestion, Inductively-Coupled Plasma Method <sup>(4)</sup>
7	Atrazine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
8	Benzene	1) Digestion, Direct Nitrogen Oxide-Acetylene Flame Method <sup>(4)</sup> 2) Digestion, Inductively-Coupled Plasma Spectrometric Method <sup>(4)</sup>
9	Benzo(a)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
10	Benzene	Purge and Trap Gas Chromatographic/Mass spectrometric Method <sup>(4)</sup>
11	Benzo(b)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
12	Benzo(k)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup> 3mg

13 Benzoic acid...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
13	Benzoic acid	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
14	Benzo(a)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
15	Benzo(g,h,i)perylene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
16	Benzo(k)fluoranthene	Digestion, Inductively-Coupled Plasma Spectrometric Method <sup>(4)</sup>
17	Benzo(e)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
18	Benzo(a)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
19	Benzo(a)anthracene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
20	Bromobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
21	Butanol	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
22	Butyl benzyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
23	Cadmium	1) Digestion, Direct Air-Acetylene Flame Method <sup>(4)</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>(4)</sup> 3) Digestion, Inductively-Coupled Plasma Spectrometric Method <sup>(4)</sup>
24	Carbazole	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(4)</sup>
25	Carbon disulfide	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
26	Carbon tetrachloride	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup> 3mg

27 Chlordane...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
27	Chlordane	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
28	p-Chloroaniline	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
29	Chlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
30	Chlorodibromomethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
31	Chloroform	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
32	o-Chlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
33	Chromium	1) Digestion, Direct Air-Acetylene Flame Method <sup>(4)</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>(4)</sup> 3) Digestion, Inductively-Coupled Plasma Spectrometric Method <sup>(4)</sup>
34	Chromium (III)	1) Digestion, Direct Air-Acetylene Flame Method; Colorimetric Method; Calculation <sup>(4)</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method; Colorimetric Method; Calculation <sup>(4)</sup> 3) Digestion, Inductively Coupled Plasma Spectrometric Method; Colorimetric Method; Calculation <sup>(4)</sup>
35	Chromium (VI)	1) Colorimetric Method <sup>(4)</sup> 2) Extraction, Air-Acetylene Flame Method <sup>(4)</sup>
36	Chrysene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup> <i>Sample</i>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
37	Cyanide	1) Distillation, Titrimetric Method <sup>(4)</sup> 2) Distillation, Colorimetric Method <sup>(4)</sup>
38	2,4-D	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup>
39	DDD	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
40	DDC	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
41	DDT	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
42	Dibenz(a,h)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
43	Di-n-butyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
44	1,2-Dichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
45	1,3-Dichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
46	1,4-Dichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
47	3,3'-Dichlorobenzidine	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
48	1,1-Dichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
49	1,2-Dichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup> <i>Sample</i>

ลำดับที่	สารเคมี	วิธีวิเคราะห์
50	1,1-Dichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
51	cis-1,2-Dichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
52	trans-1,2-Dichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
53	1,1,1-Trichloroethylene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
54	1,1,2-Trichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
55	1,1,2,2-Tetrachloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
56	1,1,2,2-Tetrachloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
57	Dieldrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
58	Diethyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
59	2,4-Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
60	2,4-Dinitrophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
61	2,4-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
62	2,6-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
63	Di-n-Octyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
64	Endosulfan	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid...

2) Liquid-Liquid...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
65	Endrin	2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup> 1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
66	Ethylbenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
67	Fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
68	Fluorene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
69	Heptachlor	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
70	Heptachlor epoxide	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
71	Hexachlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
72	Hexachloro-1,3-butadiene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
73	n-Hexane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
74	$\alpha$ -HCH	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
75	$\beta$ -HCH	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(4)</sup> 2) Liquid-Liquid...

2) Liquid-Liquid...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
76	p-CH	1) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup> 3) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
77	Hexachlorocyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
78	Hexachloroethane	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
79	Indeno(1,2,3-cd)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
80	Isophorone	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
81	Lead	1) Digestion, Direct Air-Acetylene Flame Method <sup>(4)</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>(4)</sup> 3) Digestion, Inductively Coupled Plasma Spectrometric Method <sup>(4)</sup>
82	Manganese	1) Digestion, Direct Air-Acetylene Flame Method <sup>(4)</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>(4)</sup> 3) Digestion, Inductively Coupled Plasma Spectrometric Method <sup>(4)</sup>
83	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(4)</sup>
84	Methanol	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
85	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
86	Methyl bromide	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>

87 Methylene chloride...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
87	Methylene chloride	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
88	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
89	2-Methylnaphthalene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
90	Methyl tert-butyl ether	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
91	Naphthalene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
92	Nickel	1) Digestion, Direct Air-Acetylene Flame Method <sup>(4)</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>(4)</sup> 3) Digestion, Inductively Coupled Plasma Spectrometric Method <sup>(4)</sup>
93	Nitrobenzene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
94	N-Nitrosodiphenylamine	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
95	N-Nitrosodi-n-propylamine	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
96	Polychlorinated Biphenyls - PCB-1016 - PCB-1221 - PCB-1232 - PCB-1242 - PCB-1248 - PCB-1254 - PCB-1260	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
97	Pentachlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
98	pH	Electrometric method <sup>(4)</sup> 3mp

99 Phenanthrene...

ลำดับที่	สารเคมี	วิธีการวิเคราะห์
100	Phenanthrene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[9,25]</sup>
101	Phenol	1) Distillation, Chloroform Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[9]</sup> 2) Distillation, Direct Photometric Method <sup>[9]</sup> 3) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[9]</sup>
102	Pyrene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[9]</sup>
103	Selenium	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[9]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[9]</sup>
104	Silver	1) Digestion, Direct Air-Acetylene Flame Method <sup>[9]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[9]</sup>
105	Styrene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[9]</sup>
106	1,1,2,2-Tetrachloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[9]</sup>
107	Tetrachloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[9]</sup>
108	Toluene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[9]</sup>
109	TPH (C <sub>8</sub> -C <sub>16</sub> )	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[9,25]</sup>
110	TPH (C <sub>10</sub> -C <sub>35</sub> )	1) Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[9,25]</sup> 2) Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass spectrometric Method <sup>[9,25]</sup>
111	1,2,4-Trichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[9]</sup>
112	1,1,1-Trichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[9]</sup>
113	1,1,2-Trichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[9]</sup>
114	Trichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[9]</sup>
115	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[9]</sup>
116	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[9]</sup>
117	1,3,5-Trimethylbenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[9]</sup>
118	Vanadium	Digestion, inductively Coupled Plasma Spectrometric Method <sup>[9]</sup>
119	Vinyl acetate	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[9]</sup>
120	Vinyl chloride	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[9]</sup>
121	m-Xylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[9]</sup>
122	o-Xylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[9]</sup>
123	p-Xylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[9]</sup>
124	Xylene (Total)	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[9]</sup>

2) Separatory...

ลำดับที่	สารเคมี	วิธีการวิเคราะห์
111	1,2,4-Trichlorobenzene	2) Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass spectrometric Method <sup>[9,25]</sup>
112	1,1,1-Trichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[9]</sup>
113	1,1,2-Trichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[9]</sup>
114	Trichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[9]</sup>
115	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[9]</sup>
116	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[9]</sup>
117	1,3,5-Trimethylbenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[9]</sup>
118	Vanadium	Digestion, inductively Coupled Plasma Spectrometric Method <sup>[9]</sup>
119	Vinyl acetate	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[9]</sup>
120	Vinyl chloride	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[9]</sup>
121	m-Xylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[9]</sup>
122	o-Xylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[9]</sup>
123	p-Xylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[9]</sup>
124	Xylene (Total)	Purge and Trap Gas Chromatographic/Mass Spectrometric Method <sup>[9]</sup>



ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
125	Zinc	1) Digestion, Direct Air-Acetylene Flame Method <sup>[4]</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>[4]</sup> 3) Digestion, Inductively Coupled Plasma Spectrometric Method <sup>[4]</sup>

อากาศเสีย (ปล่อยระบาย) จำนวน 27 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Antimony	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
2	Arsenic	1) Isokinetic Sampling, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
3	Beryllium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
4	Cadmium	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
5	Carbon monoxide	Instrumental Analyzer Method <sup>[5]</sup>
6	Chlorine	1) Absorption Sampling, Ion Chromatographic Method <sup>[5]</sup> 2) Isokinetic Sampling, Ion Chromatographic Method <sup>[5]</sup>
7	Chromium	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>

B-Cobalt

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
8	Cobalt	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
9	Copper	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
10	Cresol	Absorption Sampling, Gas Chromatographic Method <sup>[5]</sup>
11	Dioxin/Furans	Isokinetic Sampling <sup>[5]</sup>
12	Hydrogen chloride	1) Absorption Sampling, Ion Chromatographic Method <sup>[5]</sup> 2) Isokinetic Sampling, Ion Chromatographic Method <sup>[5]</sup>
13	Hydrogen fluoride	1) Absorption Sampling, Ion Chromatographic Method <sup>[5]</sup> 2) Isokinetic Sampling, Ion Chromatographic Method <sup>[5]</sup>
14	Hydrogen sulfide	Absorption Sampling, Iodometric Method <sup>[5]</sup>
15	Lead	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
16	Manganese	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
17	Nitrogen	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
18	Oil	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>

B-Cobalt

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
19	Opacity	Ringelmann's Method <sup>(2)</sup>
20	Oxides of Nitrogen	1) Adsorption Sampling, Phenoldisulfonic acid Method <sup>(2)</sup> 2) Adsorption Sampling, Ion Chromatographic Method <sup>(2)</sup> 3) Instrumental Analyzer Method <sup>(2)</sup>
21	Selenium	1) Isokinetic Sampling, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(2)</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(2)</sup>
22	Sulfur dioxide	1) Isokinetic Sampling, Barium-Thorin Titrimetric Method <sup>(2)</sup> 2) Adsorption Sampling, Barium-Thorin Titrimetric Method <sup>(2)</sup> 3) Instrumental Analyzer Method <sup>(2)</sup>
23	Sulfuric acid	Isokinetic Sampling, Barium-Thorin Titrimetric Method <sup>(2)</sup>
24	Tin	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(2)</sup>
25	Total Suspended Particulate	1) Isokinetic Sampling, Gravimetric Method <sup>(2)</sup> 2) Paired Train, Isokinetic Sampling, Gravimetric Method <sup>(2)</sup>
26	Vanadium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(2)</sup>
27	Xylene	1) Adsorption Sampling, Gas Chromatographic Method <sup>(2)</sup> 2) Adsorption Sampling, Gas Chromatographic/Mass Spectrometric Method <sup>(2)</sup>

สิ่งปฏิกูล

สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว จำนวน ๒๔ รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1,6,9,22)</sup> 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1,6,9,22)</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>(10,22)</sup> 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,22)</sup>
2	Antimony	1) Waste Extraction, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(1,6,16)</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(10,22)</sup> 3) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(10,22)</sup> 4) Digestion, Inductively-Coupled Plasma Method <sup>(10,22)</sup>
3	Arsenic	1) Waste Extraction, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(1,6,16)</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(10,22)</sup> 3) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(10,22)</sup> 4) Digestion, Inductively-Coupled Plasma Method <sup>(10,22)</sup>
4	Barium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>(1,6,16)</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(10,22)</sup>

2) Waste extraction

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
5	Beryllium	2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1,6,14)</sup> 3) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7,15)</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup> 1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1,6,14)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup>
6	Cadmium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>(1,6,15)</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1,6,14)</sup> 3) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7,15)</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup>
7	Chlordane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1,9,22)</sup> 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(3,9,22)</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>(3,9,22)</sup> 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(3,9,27)</sup>
8	Chromium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>(1,6,15)</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1,6,14)</sup> <i>3) Digestion...</i>

3) Digestion...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
9	Chromium (III)	3) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7,15)</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup> 1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method; Waste Extraction, Colorimetric Method; Calculation <sup>(1,6,15,17)</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction, Colorimetric Method; Calculation <sup>(1,6,14,17)</sup> 3) Digestion, Flame Atomic Absorption Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation <sup>(7,8,15,17)</sup> 4) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation <sup>(7,8,14,17)</sup>
10	Chromium (VI)	1) Waste Extraction, Colorimetric Method <sup>(1,17)</sup> 2) Alkaline Digestion, Colorimetric Method <sup>(8,17)</sup>
11	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1,6,14)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup>
12	Copper	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>(1,6,15)</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1,6,14)</sup> 3) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7,15)</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup> <i>3) Digestion...</i>

13 2,4-D...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
13	2,4-D	1) Waste Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1,25)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(25)</sup>
14	DDD	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1,9,22)</sup> 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1,9,27)</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>(10,22)</sup> 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>
15	DDE	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1,9,22)</sup> 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1,9,27)</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>(10,22)</sup> 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>
16	DDT	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1,9,22)</sup> 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1,9,27)</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>(10,22)</sup> 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup> <i>3mg/L</i>

17 Dieldrin...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
17	Dieldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1,9,22)</sup> 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1,9,27)</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>(10,22)</sup> 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>
18	Dieldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1,9,22)</sup> 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1,9,27)</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>(10,22)</sup> 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>
19	Heptachlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1,9,22)</sup> 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1,9,27)</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>(10,22)</sup> 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>
20	Lead	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>(1,6,18)</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1,4,14)</sup> <i>3mg/L</i>

3) Digestion...

Index	Compound	Reference
21	Lindane	<p>3) Digestion, Flame Atomic Absorption Spectrometric Method<sup>(7,15)</sup></p> <p>4) Digestion, Inductively Coupled Plasma Method<sup>(7,16)</sup></p> <p>1) Waste Extraction, Separatory Funnel</p> <p>Liquid-Liquid Extraction, Gas Chromatographic Method<sup>(1,2,18)</sup></p> <p>2) Waste Extraction, Separatory Funnel</p> <p>Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method<sup>(1,2,19)</sup></p> <p>3) Soxhlet Extraction, Gas Chromatographic Method<sup>(10,2)</sup></p> <p>4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method<sup>(10,27)</sup></p> <p>5) Waste Extraction, Separatory Funnel</p> <p>Liquid-Liquid Extraction, Gas Chromatographic Method<sup>(1,2,22)</sup></p> <p>2) Waste Extraction, Digestion, Inductively Coupled Plasma Method<sup>(1,1,18)</sup></p> <p>3) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method<sup>(7,9)</sup></p> <p>4) Digestion, Inductively Coupled Plasma Method<sup>(7,18)</sup></p>
23	Methoxychlor	<p>1) Waste Extraction, Separatory Funnel</p> <p>Liquid-Liquid Extraction, Gas Chromatographic Method<sup>(1,2,22)</sup></p> <p>2) Waste Extraction, Separatory Funnel</p> <p>Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method<sup>(1,2,27)</sup></p> <p>3) Soxhlet Extraction, Gas Chromatographic Method<sup>(10,22)</sup></p> <p>4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method<sup>(10,27)</sup></p>

24 Molybdenum...

[illegible]

#### 4) Digestion...



ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
30	Silver	4) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup> 1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1,6,14)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup>
31	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1,6,14)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup>
32	Trichloroethylene	1) Waste Extraction, Purge and Trap (for Gas Chromatographic/Mass Spectrometric Method) <sup>(10,27)</sup> 2) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(11,27)</sup>
33	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1,6,14)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup>
34	Zinc	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>(1,6,15)</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1,6,14)</sup> 3) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7,15)</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup>

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>

2 Acetone...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
2	Acetone	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,26)</sup>
3	Aldrin	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>(11,22)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,27)</sup>
4	Anthracene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>
5	Antimony	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(7,16)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup>
6	Arsenic	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(7,16)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup>
7	Atrazine	Ultrasonic Extraction, Gas Chromatographic Method <sup>(11,24)</sup>
8	Barium	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7,15)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup>
9	Benz(a)anthracene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>
10	Benzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,26)</sup>
11	Benzo(b)fluoranthene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>
12	Benzo(k)fluoranthene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>
13	Benzoic acid	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,27)</sup>

14 Benzo(a)pyrene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
14	Benzo(a)pyrene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,27)</sup>
15	Benzo(g,h,i)perylene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,27)</sup>
16	Beryllium	Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup>
17	Bis(2-chloroethyl)ether	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,27)</sup>
18	Bis(2-ethylhexyl)phthalate	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,27)</sup>
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,26)</sup>
20	Bromoform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,26)</sup>
21	Butanol	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,26)</sup>
22	Butyl benzyl phthalate	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,27)</sup>
23	Cadmium	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7,14)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup>
24	Carbazole	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,27)</sup>
25	Carbon disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,26)</sup>
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,26)</sup>
27	Chlordane	1) Ultrasonic Extraction, Gas Chromatographic/ Method <sup>(11,22)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,27)</sup>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
28	p-Chloroaniline	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,27)</sup>
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,26)</sup>
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,26)</sup>
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,26)</sup>
32	2-Chlorophenol	Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,22)</sup>
33	Chromium	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7,14)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup>
34	Chromium (III)	1) Digestion, Flame Atomic Absorption Spectrometric Method; Colorimetric Method; Calculation <sup>(7,14,17)</sup> 2) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation <sup>(7,14,17)</sup>
35	Chromium (VI)	Alkaline Digestion, Colorimetric Method <sup>(2,17)</sup>
36	Chrysene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,27)</sup>
37	Cyanide	1) Extraction, Distillation, Titrimetric Method <sup>(28,29,30)</sup> 2) Extraction, Distillation, Colorimetric Method <sup>(28,29,30)</sup>
38	2,4-D	Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(29)</sup>
39	DDD	1) Ultrasonic Extraction, Gas Chromatographic/ Method <sup>(11,22)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,27)</sup>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
40	DDE	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>(11,22)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,27)</sup>
41	DDT	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>(11,24)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,27)</sup>
42	Dibenz(a,h)anthracene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>
43	Di-n-butyl phthalate	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>
44	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,24)</sup>
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,24)</sup>
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,24)</sup>
47	3,3'-Dichlorobenzidine	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>
48	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,24)</sup>
49	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,24)</sup>
50	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,24)</sup>
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,24)</sup>
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,24)</sup>
53	2,4-Dichlorophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,27)</sup>

54 1,2-Dichloropropane...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,24)</sup>
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,24)</sup>
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,24)</sup>
57	Dieldrin	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>(11,22)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,27)</sup>
58	Diethyl phthalate	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>
59	2,4-Dimethylphenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,27)</sup>
60	2,4-Dinitrophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,27)</sup>
61	2,4-Dinitrotoluene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>
62	2,6-Dinitrotoluene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>
63	Di-n-Octyl phthalate	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>
64	Endosulfan	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>(11,22)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,27)</sup>
65	Endrin	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>(11,22)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,27)</sup>
66	Ethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,24)</sup>

67 Fluoranthene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
67	Fluoranthene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,27)</sup>
68	Fluorene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(10,27)</sup>
69	Heptachlor	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>(11,22)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,27)</sup>
70	Heptachlor epoxide	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>(11,22)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,27)</sup>
71	Hexachlorobenzene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,27)</sup>
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,26)</sup>
73	n-Hexane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,26)</sup>
74	$\alpha$ -HCH	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>(11,22)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,27)</sup>
75	$\beta$ -HCH	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>(11,22)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,27)</sup>
76	$\gamma$ -HCH	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>(11,22)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,27)</sup>
77	Hexachlorocyclopentadiene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>

78 Hexachloroethane..

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
78	Hexachloroethane	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>
79	Indeno(1,2,3-cd)pyrene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>
80	Isophorone	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>
81	Lead	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7,15)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,18)</sup>
82	Manganese	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7,15)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,18)</sup>
83	Mercury	1) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(9)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,18)</sup>
84	Methanol	Ultrasonic Extraction, Direct Aqueous Injection, Gas Chromatographic Method <sup>(11,21)</sup>
85	Methoxychlor	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>(11,22)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,27)</sup>
86	Methyl bromide	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,26)</sup>
87	Methylene chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,26)</sup>
88	2-Methylphenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,27)</sup>
89	2-Methylnaphthalene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,27)</sup>

90 Methyl isobutyl ether..

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
90	Methyl tert-butyl ether	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,26)</sup>
91	Naphthalene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(16,27)</sup>
92	Nickel	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7,15)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup>
93	Nitrobenzene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>
94	N-Nitrosodiphenylamine	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>
95	N-Nitrosodi-n-propylamine	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>
96	Polychlorinated Biphenyls - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260	Soxhlet Extraction, Gas Chromatographic Method <sup>(10,28)</sup>
97	Pentachlorophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(4)</sup>
98	Phenanthrene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>
99	Phenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,27)</sup>
100	Pyrene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,27)</sup>
101	Selenium	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(7,20)</sup>

2) Digestion...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
102	Silver	2) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup> 1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7,15)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup>
103	Styrene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,26)</sup>
104	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,26)</sup>
105	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,26)</sup>
106	Toluene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,26)</sup>
107	TPH (C <sub>9</sub> -C <sub>10</sub> )	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,26)</sup>
108	TPH (C <sub>9</sub> -C <sub>16</sub> )	1) Soxhlet Extraction, Gas Chromatographic Method <sup>(10,21)</sup> 2) Soxhlet Extraction, Gas Chromatographic/Mass spectrometric Method <sup>(10,26)</sup>
109	TPH (C <sub>15</sub> -C <sub>30</sub> )	1) Soxhlet Extraction, Gas Chromatographic Method <sup>(10,21)</sup> 2) Soxhlet Extraction, Gas Chromatographic/Mass spectrometric Method <sup>(10,26)</sup>
110	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,26)</sup>
111	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,26)</sup>
112	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,26)</sup>
113	Trichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,26)</sup>

114 2,4,5-Trichlorophenol...



ลำดับที่	สารเคมี	วิธีการตรวจ
114	2,4,5-Trichlorophenol	Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,12)</sup>
115	2,4,6-Trichlorophenol	Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,12)</sup>
116	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,16)</sup>
117	Vanadium	Digestion, Inductively-Coupled Plasma Method <sup>(7,10)</sup>
118	Vinyl acetate	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,16)</sup>
119	Vinyl chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,16)</sup>
120	m-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,16)</sup>
121	o-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,16)</sup>
122	p-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,16)</sup>
123	Xylene(Total)	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,16)</sup>
124	Zinc	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7,11)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(7,11)</sup>

## เอกสารอ้างอิง

- กระทรวงอุตสาหกรรม. ประกาศกระทรวงอุตสาหกรรม, พ.ศ. 2548. เรื่อง การกำจัดสิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว.ราชกิจจานุเบกษา. 25 มกราคม 2549. เล่มที่ 123 ตอนพิเศษ 114.
- กระทรวงอุตสาหกรรม. ประกาศกระทรวงอุตสาหกรรม, พ.ศ. 2549. เรื่อง กำหนดค่าปริมาณเข้มข้นที่เจือปนในอากาศที่ระบายออกจากปล่องของหม้อน้ำโรงสีข้าวที่ใช้แก๊สเป็นเชื้อเพลิง. ราชกิจจานุเบกษา. 4 ธันวาคม 2549. เล่มที่ 123 ตอนพิเศษ 125.
- สมาคมวิศวกรรมสิ่งแวดล้อมแห่งประเทศไทย. คู่มือวิเคราะห์น้ำเสีย. พิมพ์ครั้งที่ 4. กรุงเทพฯ: เรือนแก้วการพิมพ์, 2547.

4. APHA, AWWA, WEF. Standard Methods for the Examination of Water and Wastewater. 23<sup>rd</sup> ed. Washington, DC: APHA, 2017.

5. United States Environmental Protection Agency. Standards of Performance for New Stationary Sources. 40 CFR 60. Appendix A, 2023.

6. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. SW-846, 2020.

7. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Acid Digestion of Sediments, Sludges, and Soils. SW-846 Method 3050B, 1996.

8. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Alkaline Digestion for Hexavalent Chromium. SW-846 Method 3060A, 1996.

9. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Separatory Funnel Liquid-Liquid Extraction. SW-846 Method 3510C, 1996.

10. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Soxhlet Extraction. SW-846 Method 3540C, 1996.

11. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Ultrasonic Extraction. SW-846 Method 3550C, 2007.

12. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Purge-and-Trap for Aqueous Samples. SW-846 Method 5030C, 2003.

13. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Closed-System Purge-and-Trap and Extraction for Volatile Organics in Soil and Waste Samples. SW-846 Method 5035, 1996.

14. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Inductively Coupled Plasma-optical Emission Spectrometry. SW-846 Method 6010D, 2018.

15. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Flame Atomic Absorption Spectrophotometry. SW-846 Method 7000B, 2007.

16. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Antimony and Arsenic (Atomic Absorption, Borohydride Reduction). SW-846 Method 7062, 1994.

17. United States...

4. APHA...

17. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Chromium, Hexavalent (Colorimetric), SW-846 Method 7196A, 1992.

18. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Mercury in Liquid Waste (Manual Cold-Vapor Technique, SW-846 Method 7470A, 1994.

19. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Mercury in Solid or Semisolid Waste (Manual Cold-Vapor Technique, SW-846 Method 7471B, 2007.

20. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Selenium (Atomic Absorption, Borohydride Reduction), SW-846 Method 7742, 1994.

21. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Nonhalogenated Organics Using GC/FID. SW-846 Method 8015D, 2003.

22. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Organochlorine Pesticide by Gas Chromatography. SW-846 Method 8081B, 2007.

23. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Polychlorinated Biphenyls (PCBs) By Gas Chromatography. SW-846 Method 8082A, 2007.

24. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Organophosphorus Compounds by Gas Chromatography. SW-846 Method 8141B, 2007.

25. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Chlorinated Herbicides By GC Using Methylation or Pentachlorobenzoyl Chloride Derivatization. SW-846 Method 8150A, 1995.

26. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry. SW-846 Method 8210B, 2005.

27. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry. SW-846 Method 8260, 2011.

28. United States

28. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Total and Amenable Cyanide: Distillation. SW-846 Method 9010C, 2004.

29. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Cyanide Extraction Procedure for Solids and Oils. SW-846 Method 9013A, 2014.

30. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Cyanide in Waters and Extracts Using Titrimetric and Manual Spectrophotometric. SW-846 Method 9014, 2014.

31. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. pH Electrometric Measurement. SW-846 Method 9040C, 2004.

32. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Solid and Waste pH. SW-846 Method 9045D, 2004.

ภาคผนวก ข

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ใบรับรองความสามารถห้องปฏิบัติการและขอขยายการรับรอง  
ห้องปฏิบัติการทดสอบ ตามมาตรฐาน ISO/IEC 17025  
จากสำนักงานมาตรฐานอุตสาหกรรม (สมอ.)



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ข้อกำหนดทั่วไปว่าด้วยความสามารถของ ห้องปฏิบัติการทดสอบและห้องปฏิบัติการสอบเทียบ  
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(Details of the scheme and scope of the certificate are shown in QR CODE and [www.tisi.go.th](http://www.tisi.go.th))

ออกให้ ณ วันที่ ๖ ธันวาคม พ.ศ. ๒๕๖๖  
(Issue date : 6 December B.E. 2566 (2023))

(นายวีระศักดิ์ เพงหลัง)



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(Scope of Accreditation for Testing)

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(Secot Company Limited, Environmental Laboratory Division)

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(Accreditation No.)

ทดสอบ 0394  
(Testing 0394)

ฉบับที่ 02  
(Issue No.02)

ออกให้ตั้งแต่วันที่ 30 ตุลาคม พ.ศ. 2566  
(Valid from) (30 October B.E.2566 (2023))

ถึงวันที่ 8 กันยายน พ.ศ. 2571  
(Until) (8 September B.E.2571 (2028))

สถานภาพห้องปฏิบัติการ  
(Laboratory status)

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☐เคลื่อนที่  
(Mobile)

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(Multisite)

สาขาการทดสอบ (Field of Testing)	รายการทดสอบ (Parameter)	วิธีทดสอบ (Test Method)
สาขาสิ่งแวดล้อม (environmental field)  1. น้ำและน้ำเสีย (water and wastewater)	- โลหะหนัก (heavy metals)  • สารหนู (Arsenic, As) 0.000 5 mg/L ถึง 0.090 0 mg/L  • สารหนู (Arsenic, As) 0.05 mg/L ถึง 4.50 mg/L  • แบเรียม (Barium, Ba) 0.02 mg/L ถึง 4.50 mg/L  • แคดเมียม (Cadmium, Cd) 0.01 mg/L ถึง 4.50 mg/L  • โครเมียม (Chromium, Cr) 0.01 mg/L ถึง 4.50 mg/L	- Standard Methods for the Examination of Water and Wastewater, APHA , AWWA, WEF, 23 <sup>rd</sup> edition , 2017, Part 3030 F and Part 3114 C  - Standard Methods for the Examination of Water and Wastewater, APHA , AWWA, WEF, 23 <sup>rd</sup> edition , 2017, Part 3030 E and Part 3120 B

กระทรวงอุตสาหกรรมสำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม  
(Ministry of Industry, Thai Industrial Standards Institute)

หน้าที่ 1/9

รายละเอียดสาขาและขอบข่ายใบรับรองห้องปฏิบัติการ

(Scope of Accreditation for Testing)

ใบรับรองเลขที่

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ฉบับที่ 02  
(Issue No.02)

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สาขาการทดสอบ (Field of Testing)	รายการทดสอบ (Parameter)	วิธีทดสอบ (Test Method)
<p>สาขาส่งแวดล้อม (environmental field)</p> <p>1. น้ำและน้ำเสีย (ต่อ) (water and wastewater) (cont.)</p>	<p>- โลหะหนัก (heavy metals)</p> <ul style="list-style-type: none"> <li>ทองแดง (Copper, Cu) 0.02 mg/L ถึง 4.50 mg/L</li> <li>เหล็ก (Iron, Fe) 0.05 mg/L ถึง 9.00 mg/L</li> <li>ตะกั่ว (Lead, Pb) 0.03 mg/L ถึง 4.50 mg/L</li> <li>แมงกานีส (Manganese, Mn) 0.01 mg/L ถึง 9.00 mg/L</li> <li>นิกเกิล (Nickel, Ni) 0.01 mg/L ถึง 4.50 mg/L</li> <li>สังกะสี (Zinc, Zn) 0.02 mg/L ถึง 9.00 mg/L</li> </ul>	<p>- Standard Methods for the Examination of Water and Wastewater, APHA , AWWA, WEF, 23<sup>rd</sup> edition , 2017, Part 3030 E and Part 3120 B</p>

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สาขาการทดสอบ (Field of Testing)	รายการทดสอบ (Parameter)	วิธีทดสอบ (Test Method)
<p>สาขาส่งแวดล้อม (environmental field)</p> <p>1. น้ำและน้ำเสีย (ต่อ) (water and wastewater) (cont.)</p>	<p>- ซีโอดี (Chemical oxygen demand, COD) 100 mg/L ถึง 4 000 mg/L</p>	<p>- Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WEF, 23<sup>rd</sup> edition , 2017, Part 5220 D</p>
<p>2. บริเวณทำงาน (workplace)</p>	<p>- ฝุ่นละอองรวม (Total dust) 0.10 mg/filter ถึง 2.00 mg/filter</p> <p>- ฝุ่นละอองขนาดเล็ก (Respirable dust) 0.10 mg/filter ถึง 2.00 mg/filter</p>	<p>- NIOSH Manual of Analytical Methods (NMAM) , method 0500, 4<sup>th</sup> edition , 15<sup>th</sup> August 1994 (Exclude Sampling)</p> <p>- NIOSH Manual of Analytical Methods (NMAM) , method 0600, 4<sup>th</sup> edition , 15<sup>th</sup> January 1998 (Exclude Sampling)</p>



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สาขาการทดสอบ (Field of Testing)	รายการทดสอบ (Parameter)	วิธีทดสอบ (Test Method)
<p>สาขาส่งแวดล้อม (environmental field)</p> <p>2. บริเวณทำงาน (ต่อ) (workplace) (cont.)</p>	<ul style="list-style-type: none"> <li>เบนซีน (Benzene) 1.10 µg/tube ถึง 420 µg/tube</li> <li>โทลูอีน (Toluene) 1.10 µg/tube ถึง 420 µg/tube</li> <li>โทโทโรซีน (Total xylenes) 2.20 µg/tube ถึง 840 µg/tube</li> <li>เมตา, พารา-ไซลีน (m, p- Xylene) 1.10 µg/tube ถึง 420 µg/tube</li> <li>ออร์โธ-ไซลีน (o- Xylene) 1.10 µg/tube ถึง 420 µg/tube</li> </ul>	<ul style="list-style-type: none"> <li>- NIOSH Manual of Analytical Methods (NMAM) , method 1501, 4<sup>th</sup> edition , 15<sup>th</sup> March 2003 (Exclude Sampling)</li> </ul>
<p>3. ปล่องระบายอากาศ (stack)</p>	<ul style="list-style-type: none"> <li>- ซัลเฟอร์ไดออกไซด์ (Sulfur dioxide ) 1.00 mg/L ถึง 16 000 mg/L (solution)</li> </ul>	<ul style="list-style-type: none"> <li>- US.EPA , Code of Federal Regulations , 40 CFR 60 appendix A , method 6 , July 2019 (Exclude Sampling)</li> </ul>

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สาขาการทดสอบ (Field of Testing)	รายการทดสอบ (Parameter)	วิธีทดสอบ (Test Method)
<p>สาขาส่งแวดล้อม (environmental field)</p> <p>3. ปล่องระบายอากาศ (ต่อ) (stack) (cont.)</p>	<ul style="list-style-type: none"> <li>- ไฮโดรเจนฟลูออไรด์ (Hydrogen fluoride) 5 µg/sample ถึง 400 µg/sample</li> <li>- ไฮโดรเจนคลอไรด์ (Hydrogen chloride) 5 µg/sample ถึง 400 µg/sample</li> </ul>	<ul style="list-style-type: none"> <li>- WI-7.2-1-22 based on US.EPA , Code of Federal Regulations , 40 CFR 60 appendix A, method 26 , 2019 (Exclude Sampling)</li> </ul>

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สาขาการทดสอบ (Field of Testing)	รายการทดสอบ (Parameter)	วิธีทดสอบ (Test Method)
<p>สาขาส่งแวดล้อม (environmental field)</p> <p>4. บรรยากาศทั่วไป (ambient air)</p>	<p>- สารอินทรีย์ระเหยง่าย (Volatile organic compounds, VOCs)</p> <ul style="list-style-type: none"> <li>คลอโรอีเทน (Chloroethene) 0.05 <math>\mu\text{g}/\text{m}^3</math> ถึง 51.00 <math>\mu\text{g}/\text{m}^3</math> (0.02 ppbv ถึง 20.00 ppbv)</li> <li>1,3-บิวทาไดเอิน (1,3-butadiene) 0.04 <math>\mu\text{g}/\text{m}^3</math> ถึง 44.00 <math>\mu\text{g}/\text{m}^3</math> (0.02 ppbv ถึง 20.00 ppbv)</li> <li>โบรมอมีเทน (Bromomethane) 0.08 <math>\mu\text{g}/\text{m}^3</math> ถึง 77.00 <math>\mu\text{g}/\text{m}^3</math> (0.02 ppbv ถึง 20.00 ppbv)</li> <li>อะคลอลีน (Acrolein) 0.05 <math>\mu\text{g}/\text{m}^3</math> ถึง 45.00 <math>\mu\text{g}/\text{m}^3</math> (0.02 ppbv ถึง 20.00 ppbv)</li> </ul>	<p>- WI-7.2-1-24 based on US EPA , Compendium Method TO-15 , EPA/625/R-96/010b, Second edition, January 1999</p>

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สาขาการทดสอบ (Field of Testing)	รายการทดสอบ (Parameter)	วิธีทดสอบ (Test Method)
<p>สาขาส่งแวดล้อม (environmental field)</p> <p>4. บรรยากาศทั่วไป (ต่อ) (ambient air) (cont.)</p>	<p>- สารอินทรีย์ระเหยง่าย (Volatile organic compounds, VOCs)</p> <ul style="list-style-type: none"> <li>อะคริโลไนไตรล์ (Acrylonitrile) 0.04 <math>\mu\text{g}/\text{m}^3</math> ถึง 43.00 <math>\mu\text{g}/\text{m}^3</math> (0.02 ppbv ถึง 20.00 ppbv)</li> <li>ไดคลอโรมีเทน (Dichloromethane) 0.14 <math>\mu\text{g}/\text{m}^3</math> to 69.00 <math>\mu\text{g}/\text{m}^3</math> (0.04 ppbv ถึง 20.00 ppbv)</li> <li>คาร์บอนไดซัลไฟด์ (Carbon disulfide) 0.06 <math>\mu\text{g}/\text{m}^3</math> ถึง 62.00 <math>\mu\text{g}/\text{m}^3</math> (0.02 ppbv ถึง 20.00 ppbv)</li> <li>ไตรคลอโรมีเทน (Trichloromethane) 0.20 <math>\mu\text{g}/\text{m}^3</math> ถึง 97.00 <math>\mu\text{g}/\text{m}^3</math> (0.04 ppbv ถึง 20.00 ppbv)</li> <li>1,2-ไดคลอโรอีเทน (1,2-dichloroethane) 0.08 <math>\mu\text{g}/\text{m}^3</math> ถึง 80.00 <math>\mu\text{g}/\text{m}^3</math> (0.02 ppbv ถึง 20.00 ppbv)</li> </ul>	<p>- WI-7.2-1-24 based on US EPA , Compendium Method TO-15 , EPA/625/R-96/010b, Second edition, January 1999</p>

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สาขาการทดสอบ (Field of Testing)	รายการทดสอบ (Parameter)	วิธีทดสอบ (Test Method)
<p>สาขาส่งแวดล้อม (environmental field)</p> <p>4. บรรยากาศทั่วไป (ต่อ) (ambient air) (cont.)</p>	<p>- สารอินทรีย์ระเหยง่าย (Volatile organic compounds, VOCs)</p> <ul style="list-style-type: none"> <li>เบนซีน (Benzene) 0.06 <math>\mu\text{g}/\text{m}^3</math> ถึง 63.00 <math>\mu\text{g}/\text{m}^3</math> (0.02 ppbv ถึง 20.00 ppbv)</li> <li>คาร์บอนเตตระคลอไรด์ (Carbon tetrachloride) 0.25 <math>\mu\text{g}/\text{m}^3</math> ถึง 125 <math>\mu\text{g}/\text{m}^3</math> (0.04 ppbv ถึง 20.00 ppbv)</li> <li>ไตรคลอโรเอทิลีน (Trichloroethylene) 0.21 <math>\mu\text{g}/\text{m}^3</math> ถึง 107 <math>\mu\text{g}/\text{m}^3</math> (0.04 ppbv ถึง 20.00 ppbv)</li> <li>1,2-ไดคลอโรโพรเพน (1,2-dichloropropane) 0.18 <math>\mu\text{g}/\text{m}^3</math> ถึง 92.00 <math>\mu\text{g}/\text{m}^3</math> (0.04 ppbv ถึง 20.00 ppbv)</li> <li>เตตระคลอโรเอทิลีน (Tetrachloroethylene) 0.27 <math>\mu\text{g}/\text{m}^3</math> ถึง 135 <math>\mu\text{g}/\text{m}^3</math> (0.04 ppbv ถึง 20.00 ppbv)</li> </ul>	<p>- WI-7.2-1-24 based on US EPA , Compendium Method TO-15 , EPA/625/R-96/010b, Second edition, January 1999</p>

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สาขาการทดสอบ (Field of Testing)	รายการทดสอบ (Parameter)	วิธีทดสอบ (Test Method)
<p>สาขาส่งแวดล้อม (environmental field)</p> <p>4. บรรยากาศทั่วไป (ต่อ) (ambient air) (cont.)</p>	<p>- สารอินทรีย์ระเหยง่าย (Volatile organic compounds ,VOCs)</p> <ul style="list-style-type: none"> <li>1,2-ไดโบรมออีเทน (1,2-dibromoethane) 0.31 <math>\mu\text{g}/\text{m}^3</math> ถึง 153 <math>\mu\text{g}/\text{m}^3</math> (0.04 ppbv ถึง 20.00 ppbv)</li> <li>1,1,2,2-เตตระคลอโรอีเทน (1,1,2,2-tetrachloroethane) 0.69 <math>\mu\text{g}/\text{m}^3</math> ถึง 137 <math>\mu\text{g}/\text{m}^3</math> (0.10 ppbv ถึง 20.00 ppbv)</li> <li>เบนซิลคลอไรด์ (Benzyl chloride) 0.52 <math>\mu\text{g}/\text{m}^3</math> ถึง 103 <math>\mu\text{g}/\text{m}^3</math> (0.10 ppbv ถึง 20.00 ppbv)</li> <li>1,4-ไดคลอโรเบนซีน (1,4-dichlorobenzene) 0.24 <math>\mu\text{g}/\text{m}^3</math> ถึง 120 <math>\mu\text{g}/\text{m}^3</math> (0.04 ppbv ถึง 20.00 ppbv)</li> </ul>	<p>- WI-7.2-1-24 based on US EPA , Compendium Method TO-15 , EPA/625/R-96/010b, Second edition, January 1999</p>