

ภาคผนวก ง

ใบรับรองผลการตรวจวิเคราะห์คุณภาพสิ่งแวดล้อม

ภาคผนวก ง.1

ใบรับรองผลการตรวจวิเคราะห์
คุณภาพอากาศจากปล่องระบายอากาศ



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

STACK EMISSION ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Co., Ltd. REF. NO. : 224007_Cert-Stack/PM_Aug 24
Branch 2, Power Plant SAMPLING DATE : 29/08/2024
SAMPLING BY : SECOT Co., Ltd. ANALYTICAL DATE : 04-05/09/2024
RECEIVED DATE : 02/09/2024 SAMPLE CONDITION : Normal
REPORT DATE : 10/09/2024 FUEL TYPE : Natural Gas
SOURCE DESCRIPTION : Combustion STACK LOCATION : H-3701
OPERATOR : Mr. Song Hengchwankul
STACK DESCRIPTION
Height : 30.0 m Gas Velocity : 12.7 m/s
Diameter : 4.20 m Flow Rate* : 6,102 Nm³/min
Temperature : 184.0 °C Excess Oxygen : 15.1 %

PARAMETER	UNITS	RESULTS*		STANDARDS ^{1/}	REFERENCE
		15.1%O ₂	7%O ₂	7%O ₂	
					METHODS
Particulate Matter	mg/Ncu.m.	2.28	5.41	60	US, EPA Method 5


(Miss Porinapa Budthum)

Analyst

REG.NO. 2-239-9-0018


(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO. 2-239-9-0010

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

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

3. * At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. ^{1/} Notification of the Ministry of Industry, B.E.2549 and the Ministry of Natural Resources and Environment, B.E.2549.

The Monitoring Result of Emission Concentration H-3701

PTT Global Chemical Public Co., Ltd.

(Branch 2 : Power Plant I-1)

August 29, 2024

Run Number	Oxygen content (%)		Oxide of Nitrogen (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O ₂	Corrected Gas Conc @7% O ₂
1	15.08	15.15	16.72	16.70	40.37
2	15.07	15.03	16.53	16.50	39.07
3	15.11	14.97	16.25	16.22	38.02
Average	15.09	15.05	16.50	16.47	39.14

Run Number	Oxygen content (%)		Sulfur dioxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O ₂	Corrected Gas Conc @7% O ₂
1	15.08	15.15	0.25	0.17	0.41
2	15.07	15.03	0.14	0.07	0.17
3	15.11	14.97	0.18	0.12	0.28
Average	15.09	15.05	0.19	0.12	0.29

PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)
EMISSION TEST RESULT

Date: August 29, 2024
Start time: 10:50 AM
O₂ instrument Model: AMI 70
NO_x instrument Model: TELEDYNE 200 EM
SO₂ instrument Model: API 300 A
Fuel Type : Natural Gas

Run # : 1
Location : H-3701
Finish time : 11:10 AM
Serial No.: 161212-14
Serial No.: 435
Serial No.: 1070
Test Operator : Song H.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)
10:50 AM	15.04	16.77	0.14
10:51 AM	15.04	16.75	0.14
10:52 AM	15.06	16.79	0.14
10:53 AM	15.13	16.75	0.14
10:54 AM	15.09	16.82	0.14
10:55 AM	15.15	16.84	0.14
10:56 AM	15.12	16.72	0.14
10:57 AM	15.06	16.48	0.38
10:58 AM	15.11	16.51	0.62
10:59 AM	15.05	16.52	0.08
11:00 AM	15.05	16.64	0.05
11:01 AM	15.10	16.85	0.08
11:02 AM	15.09	16.97	0.26
11:03 AM	15.06	16.88	0.07
11:04 AM	15.05	16.77	0.17
11:05 AM	15.04	16.80	0.08
11:06 AM	15.04	16.85	0.26
11:07 AM	15.08	16.75	0.75
11:08 AM	15.13	16.70	0.54
11:09 AM	15.12	16.51	0.89
11:10 AM	15.15	16.55	0.01
Average	15.08	16.72	0.25

Signature

(Miss Katesarin Vorradetwittaya)

Environmental Scientist

PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)
EMISSION TEST RESULT

Date: August 29, 2024
Start time: 11:11 AM
O₂ instrument Model: AMI 70
NO_x instrument Model: TELEDYNE 200 EM
SO₂ instrument Model: API 300 A
Fuel Type : Natural Gas

Run # : 2
Location : H-3701
Finish time : 11:31 AM
Serial No.: 161212-14
Serial No.: 435
Serial No.: 1070
Test Operator : Song H.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)
11:11 AM	15.16	16.63	0.03
11:12 AM	15.03	16.64	0.12
11:13 AM	15.07	16.63	0.61
11:14 AM	15.09	16.68	0.48
11:15 AM	15.08	16.62	0.13
11:16 AM	15.10	16.60	0.09
11:17 AM	15.05	16.57	0.04
11:18 AM	15.09	16.62	0.03
11:19 AM	15.02	16.53	0.02
11:20 AM	15.08	16.41	0.15
11:21 AM	15.05	16.45	0.23
11:22 AM	15.06	16.48	0.02
11:23 AM	15.03	16.57	0.10
11:24 AM	15.05	16.59	0.12
11:25 AM	15.07	16.66	0.18
11:26 AM	15.12	16.55	0.09
11:27 AM	15.15	16.41	0.14
11:28 AM	15.06	16.45	0.10
11:29 AM	15.13	16.36	0.11
11:30 AM	15.02	16.40	0.09
11:31 AM	15.03	16.34	0.12
Average	15.07	16.53	0.14

Signature

(Miss Katesarin Vorradetwittaya)

Environmental Scientist

PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)

EMISSION TEST RESULT

Date: August 29, 2024
Start time: 11:32 AM
O₂ instrument Model: AMI 70
NO_x instrument Model: TELEDYNE 200 EM
SO₂ instrument Model: API 300 A
Fuel Type : Natural Gas

Run # : 3
Location : H-3701
Finish time : 11:52 AM
Serial No.: 161212-14
Serial No.: 435
Serial No.: 1070
Test Operator : Song H.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)
11:32 AM	15.11	16.54	0.02
11:33 AM	15.17	16.23	0.03
11:34 AM	15.21	16.22	0.32
11:35 AM	15.15	15.87	0.18
11:36 AM	15.13	17.09	0.15
11:37 AM	15.12	14.24	0.16
11:38 AM	15.12	14.25	0.07
11:39 AM	15.03	16.24	0.27
11:40 AM	15.10	16.23	0.21
11:41 AM	15.22	16.42	0.13
11:42 AM	15.01	16.69	0.17
11:43 AM	15.08	15.92	0.26
11:44 AM	15.06	16.50	0.21
11:45 AM	15.06	16.19	0.26
11:46 AM	15.08	15.72	0.22
11:47 AM	15.14	17.34	0.12
11:48 AM	15.16	17.17	0.28
11:49 AM	15.03	17.96	0.18
11:50 AM	15.02	15.95	0.17
11:51 AM	15.03	16.13	0.15
11:52 AM	15.20	16.38	0.16
Average	15.11	16.25	0.18

Signature

(Miss Katesarin Vorradetwittaya)

Environmental Scientist



บริษัท ซีคอต จำกัด

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STACK EMISSION ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Co., Ltd. **REF. NO. :** 224007_Cert-Stack/PM_Aug 24
Branch 2, Power Plant **SAMPLING DATE :** 29/08/2024
SAMPLING BY : SECOT Co., Ltd. **ANALYTICAL DATE :** 04-05/09/2024
RECEIVED DATE : 02/09/2024 **SAMPLE CONDITION :** Normal
REPORT DATE : 10/09/2024 **FUEL TYPE :** Natural Gas
SOURCE DESCRIPTION : Combustion **STACK LOCATION :** H-3703
OPERATOR : Mr. Song Hengchwankul

STACK DESCRIPTION

Height : 30.0 m **Gas Velocity :** 11.8 m/s
Diameter : 4.20 m **Flow Rate* :** 6,261 Ncu.m/min
Temperature : 142.8 °C **Excess Oxygen :** 15.2 %

PARAMETER	UNITS	RESULTS*		STANDARDS ^{1/}	REFERENCE
		15.2%O ₂	7%O ₂	7%O ₂	METHODS
Particulate Matter	mg/Ncu.m	2.14	5.21	60	US, EPA Method 5

(Miss Pornnapa Budthum)

Analyst

REG.NO. 7-239-0-0018

(Miss Narisa Poowasanpeteh)

Technical Management Team

REG.NO. 7-239-0-0010

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3. * At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. ^{1/} Notification of the Ministry of Industry, B.E.2549 and the Ministry of Natural Resources and Environment, B.E.2549.

**The Monitoring Result of Emission Concentration
H-3703**

PTT Global Chemical Public Co., Ltd.

(Branch 2 : Power Plant I-1)

August 29, 2024

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	15.34	15.24	29.65	29.64	72.79
2	15.27	15.17	29.15	29.14	70.69
3	15.26	15.16	29.64	29.63	71.75
Average	15.29	15.19	29.48	29.47	71.74

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	15.34	15.24	0.13	0.13	0.32
2	15.27	15.17	0.03	0.03	0.07
3	15.26	15.16	0.02	0.01	0.02
Average	15.29	15.19	0.06	0.06	0.14

**PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)
EMISSION TEST RESULT**

Date: August 29, 2024

Start time: 10:50 AM

O₂ instrument Model: AMI 70

NO_x instrument Model: Teledyne 200 EM

SO₂ instrument Model: THERMO 43 C

Fuel Type : Natural Gas

Run # : 1

Location : H-3703

Finish time : 11:10 AM

Serial No.: 121121-10

Serial No.: 433

Serial No.: 58702-319

Test Operator : Song H.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)
10:50 AM	15.43	29.76	0.05
10:51 AM	15.33	29.54	0.05
10:52 AM	15.36	29.55	0.05
10:53 AM	15.34	29.54	0.05
10:54 AM	15.33	29.41	0.09
10:55 AM	15.37	29.33	0.11
10:56 AM	15.36	29.33	0.09
10:57 AM	15.37	29.44	0.06
10:58 AM	15.35	29.59	0.06
10:59 AM	15.27	29.83	0.10
11:00 AM	15.48	30.05	0.16
11:01 AM	15.50	30.15	0.32
11:02 AM	15.24	30.02	0.42
11:03 AM	15.32	29.95	0.40
11:04 AM	15.24	30.09	0.19
11:05 AM	15.32	29.98	0.13
11:06 AM	15.33	29.67	0.10
11:07 AM	15.26	29.54	0.07
11:08 AM	15.26	29.51	0.06
11:09 AM	15.33	29.29	0.06
11:10 AM	15.31	29.13	0.05
Average	15.34	29.65	0.13

Signature



(Miss Katesarin Vorradetwittaya)

Environmental Scientist

PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)
EMISSION TEST RESULT

Date: August 29, 2024 Run # : 2
 Start time: 11:11 AM Location : H-3703
 O₂ instrument Model: AMI 70 Finish time : 11:31 AM
 NO_x instrument Model: Teledyne 200 EM Serial No.: 121121-10
 SO₂ instrument Model: THERMO 43 C Serial No.: 433
 Fuel Type : Natural Gas Test Operator : Song H.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)
11:11 AM	15.44	29.11	0.04
11:12 AM	15.35	29.03	0.04
11:13 AM	15.18	28.90	0.04
11:14 AM	15.22	29.01	0.04
11:15 AM	15.28	29.32	0.03
11:16 AM	15.28	29.29	0.03
11:17 AM	15.36	29.06	0.03
11:18 AM	15.35	28.99	0.03
11:19 AM	15.35	28.73	0.03
11:20 AM	15.18	28.65	0.02
11:21 AM	15.19	28.86	0.02
11:22 AM	15.25	28.90	0.02
11:23 AM	15.19	29.05	0.02
11:24 AM	15.32	29.40	0.02
11:25 AM	15.36	29.51	0.02
11:26 AM	15.19	29.48	0.02
11:27 AM	15.30	29.45	0.02
11:28 AM	15.32	29.40	0.02
11:29 AM	15.21	29.27	0.02
11:30 AM	15.18	29.26	0.02
11:31 AM	15.24	29.54	0.02
Average	15.27	29.15	0.03

Signature

(Miss Katesarin Vorradetwittaya)

Environmental Scientist

PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)
EMISSION TEST RESULT

Date: August 29, 2024 Run # : 3
 Start time: 11:32 AM Location : H-3703
 O₂ instrument Model: AMI 70 Finish time : 11:52 AM
 NO_x instrument Model: Teledyne 200 EM Serial No.: 121121-10
 SO₂ instrument Model: THERMO 43 C Serial No.: 433
 Fuel Type : Natural Gas Test Operator : Song H.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)
11:32 AM	15.24	29.69	0.02
11:33 AM	15.10	29.72	0.02
11:34 AM	15.04	29.67	0.02
11:35 AM	15.12	29.21	0.02
11:36 AM	15.38	29.92	0.02
11:37 AM	15.41	29.34	0.02
11:38 AM	15.25	30.12	0.02
11:39 AM	15.35	29.41	0.02
11:40 AM	15.33	29.05	0.02
11:41 AM	15.28	30.52	0.02
11:42 AM	15.29	29.52	0.02
11:43 AM	15.28	29.07	0.02
11:44 AM	15.04	29.02	0.02
11:45 AM	15.16	29.03	0.02
11:46 AM	15.15	29.04	0.02
11:47 AM	15.41	30.57	0.02
11:48 AM	15.61	29.19	0.02
11:49 AM	15.41	30.25	0.02
11:50 AM	15.21	30.18	0.02
11:51 AM	15.15	30.32	0.02
11:52 AM	15.20	29.63	0.02
Average	15.26	29.64	0.02

Signature

(Miss Katesarin Vorradetwittaya)

Environmental Scientist



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STACK EMISSION ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Co., Ltd. REF. NO. : 224007_Cert-Stack/PM_Aug 24
Branch 2, Power Plant SAMPLING DATE : 29/08/2024
SAMPLING BY : SECOT Co., Ltd. ANALYTICAL DATE : 04-05/09/2024
RECEIVED DATE : 02/09/2024 SAMPLE CONDITION : Normal
REPORT DATE : 10/09/2024 FUEL TYPE : Natural Gas
SOURCE DESCRIPTION : Combustion STACK LOCATION : H-3704
OPERATOR : Mr. Song Hengchwankul
STACK DESCRIPTION
Height : 30.0 m Gas Velocity : 12.1 m/s
Diameter : 3.60 m Flow Rate* : 6,929 Ncu,m/min
Temperature : 109.9 °C Excess Oxygen : 14.6 %

PARAMETER	UNITS	RESULTS*		STANDARDS ^{1/}	REFERENCE METHODS
		14.6%O ₂	7%O ₂	7%O ₂	
Particulate Matter	mg/Ncu.m.	2.62	5.75	60	US. EPA Method 5


(Miss Pornnapa Budthum)

Analyst

REG.NO.7-239-9-0018


(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO.7-239-9-0010

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3. * At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. ^{1/} Notification of the Ministry of Industry, B.E.2549 and the Ministry of Natural Resources and Environment, B.E.2549.

The Monitoring Result of Emission Concentration H-3704

PTT Global Chemical Public Co., Ltd.

(Branch 2 : Power Plant I-1)

August 29, 2024

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	14.62	14.56	3.73	3.70	8.11
2	14.50	14.51	3.60	3.57	7.77
3	14.53	14.61	3.52	3.49	7.71
Average	14.55	14.56	3.62	3.59	7.86

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	14.62	14.56	0.05	0.02	0.04
2	14.50	14.51	0.07	0.05	0.11
3	14.53	14.61	0.05	0.04	0.09
Average	14.55	14.56	0.06	0.04	0.08

PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)
EMISSION TEST RESULT

Date: August 29, 2024
Start time: 2:10 PM
O₂ instrument Model: AMI 70
NO_x instrument Model: Teledyne 200 EM
SO₂ instrument Model: THERMO 43 C
Fuel Type : Natural Gas

Run # : 1
Location : H-3704
Finish time : 2:30 PM
Serial No.: 121121-10
Serial No.: 433
Serial No.: 58702-319
Test Operator : Song H.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)
2:10 PM	14.35	4.37	0.06
2:11 PM	14.63	3.79	0.06
2:12 PM	14.75	3.80	0.06
2:13 PM	14.72	3.82	0.05
2:14 PM	14.64	3.83	0.05
2:15 PM	14.57	3.83	0.05
2:16 PM	14.72	3.77	0.05
2:17 PM	14.61	3.70	0.05
2:18 PM	14.66	3.60	0.05
2:19 PM	14.57	3.61	0.05
2:20 PM	14.53	3.64	0.05
2:21 PM	14.98	3.68	0.05
2:22 PM	14.64	3.74	0.05
2:23 PM	14.61	3.71	0.05
2:24 PM	14.65	3.66	0.04
2:25 PM	14.59	3.69	0.04
2:26 PM	14.58	3.70	0.04
2:27 PM	14.55	3.64	0.03
2:28 PM	14.53	3.65	0.03
2:29 PM	14.51	3.62	0.03
2:30 PM	14.54	3.55	0.03
Average	14.62	3.73	0.05

Signature

(Miss Katesarin Vorradetwittaya)

Environmental Scientist

PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)
EMISSION TEST RESULT

Date: August 29, 2024
Start time: 2:31 PM
O₂ instrument Model: AMI 70
NO_x instrument Model: Teledyne 200 EM
SO₂ instrument Model: THERMO 43 C
Fuel Type : Natural Gas

Run # : 2
Location : H-3704
Finish time : 2:51 PM
Serial No.: 121121-10
Serial No.: 433
Serial No.: 58702-319
Test Operator : Song H.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)
2:31 PM	14.53	3.58	0.03
2:32 PM	14.51	3.68	0.03
2:33 PM	14.51	3.66	0.03
2:34 PM	14.51	3.68	0.03
2:35 PM	14.51	3.68	0.03
2:36 PM	14.51	3.66	0.03
2:37 PM	14.51	3.62	0.03
2:38 PM	14.51	3.67	0.03
2:39 PM	14.51	3.63	0.03
2:40 PM	14.51	3.54	0.03
2:41 PM	14.51	3.48	0.08
2:42 PM	14.51	3.55	0.11
2:43 PM	14.49	3.59	0.11
2:44 PM	14.48	3.57	0.12
2:45 PM	14.51	3.58	0.12
2:46 PM	14.51	3.59	0.13
2:47 PM	14.47	3.62	0.10
2:48 PM	14.47	3.58	0.10
2:49 PM	14.49	3.59	0.11
2:50 PM	14.51	3.53	0.13
2:51 PM	14.51	3.45	0.12
Average	14.50	3.60	0.07

Signature

(Miss Katesarin Vorradetwittaya)

Environmental Scientist

PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1) EMISSION TEST RESULT

Date: August 29, 2024
Start time: 2:52 PM
O₂ instrument Model: AMI 70
NO_x instrument Model: Teledyne 200 EM
SO₂ instrument Model: THERMO 43 C
Fuel Type : Natural Gas

Run # : 3
Location : H-3704
Finish time : 3:12 PM
Serial No.: 121121-10
Serial No.: 433
Serial No.: 58702-319
Test Operator : Song H.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)
2:52 PM	14.51	3.43	0.05
2:53 PM	14.50	3.51	0.06
2:54 PM	14.51	3.62	0.07
2:55 PM	14.48	3.62	0.05
2:56 PM	14.49	3.54	0.05
2:57 PM	14.51	3.51	0.06
2:58 PM	14.51	3.45	0.05
2:59 PM	14.51	3.48	0.04
3:00 PM	14.51	3.54	0.04
3:01 PM	14.51	3.64	0.04
3:02 PM	14.53	3.59	0.04
3:03 PM	14.53	3.54	0.04
3:04 PM	14.57	3.48	0.04
3:05 PM	14.58	3.49	0.04
3:06 PM	14.54	3.57	0.04
3:07 PM	14.57	3.50	0.04
3:08 PM	14.56	3.46	0.04
3:09 PM	14.58	3.44	0.04
3:10 PM	14.57	3.48	0.07
3:11 PM	14.56	3.50	0.10
3:12 PM	14.56	3.48	0.09
Average	14.53	3.52	0.05

Signature

(Miss Katesarin Vorradetwittaya)

Environmental Scientist



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SECOT CO., LTD.

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STACK EMISSION ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Co., Ltd. **REF. NO. :** 224007_Cert-Stack/PM_Aug 24
Branch 2, Power Plant **SAMPLING DATE :** 29/08/2024
SAMPLING BY : SECOT Co., Ltd. **ANALYTICAL DATE :** 04-05/09/2024
RECEIVED DATE : 02/09/2024 **SAMPLE CONDITION :** Normal
REPORT DATE : 10/09/2024 **FUEL TYPE :** Natural Gas
SOURCE DESCRIPTION : Combustion **STACK LOCATION :** H-3705
OPERATOR : Mr. Song Hengchwankul
STACK DESCRIPTION
Height : 30.0 m **Gas Velocity :** 13.6 m/s
Diameter : 3.60 m **Flow Rate* :** 5,791 Nm³/min
Temperature : 109.8 °C **Excess Oxygen :** 14.8 %

PARAMETER	UNITS	RESULTS*			REFERENCE
		14.8%O ₂	7%O ₂	7%O ₂	
Particulate Matter	mg/Ncu.m.	1.94	4.38	60	US. EPA Method 5

(Miss Pornnapa Budthum)

Analyst

REG.NO.7-239-9-0018

(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO.7-239-9-0010

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

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

3. * At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. " Notification of the Ministry of Industry, B.E.2549 and the Ministry of Natural Resources and Environment, B.E.2549.

**The Monitoring Result of Emission Concentration
H-3705**

PTT Global Chemical Public Co., Ltd.

(Branch 2 : Power Plant I-1)

August 29, 2024

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	14.89	14.71	3.53	3.48	7.81
2	14.88	14.73	3.44	3.38	7.61
3	14.95	14.84	3.45	3.39	7.78
Average	14.90	14.76	3.47	3.42	7.73

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	14.89	14.71	0.28	0.22	0.49
2	14.88	14.73	0.24	0.19	0.43
3	14.95	14.84	0.24	0.20	0.46
Average	14.90	14.76	0.25	0.20	0.46

**PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)
EMISSION TEST RESULT**

Date: August 29, 2024

Start time: 2:10 PM

O₂ instrument Model: AMI 70

NO_x instrument Model: TELEDYNE 200 EM

SO₂ instrument Model: API 100 AH

Fuel Type : Natural Gas

Run # : 1

Location : H-3705

Finish time : 2:30 PM

Serial No.: 161212-14

Serial No.: 435

Serial No.: 058

Test Operator : Song H.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)
2:10 PM	14.76	3.88	0.19
2:11 PM	14.87	3.70	0.19
2:12 PM	14.96	3.31	0.19
2:13 PM	14.95	3.59	0.09
2:14 PM	14.88	4.17	0.36
2:15 PM	14.85	3.50	0.08
2:16 PM	14.84	3.80	0.09
2:17 PM	14.91	3.82	0.25
2:18 PM	14.91	3.64	0.11
2:19 PM	14.95	3.61	0.45
2:20 PM	14.98	3.27	0.18
2:21 PM	14.91	3.49	0.32
2:22 PM	14.95	3.33	0.58
2:23 PM	14.96	3.41	0.26
2:24 PM	14.90	3.51	0.70
2:25 PM	14.89	3.36	0.45
2:26 PM	14.88	3.37	0.65
2:27 PM	14.86	3.39	0.41
2:28 PM	14.88	3.33	0.11
2:29 PM	14.80	3.30	0.21
2:30 PM	14.81	3.35	0.07
Average	14.89	3.53	0.28

Signature

(Miss Katesarin Vorradetwittaya)

Environmental Scientist

PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)
EMISSION TEST RESULT

Date: August 29, 2024 Run # : 2
 Start time: 2:31 PM Location : H-3705
 O₂ instrument Model: AMI 70 Finish time : 2:51 PM
 NO_x instrument Model: TELEDYNE 200 EM Serial No.: 161212-14
 SO₂ instrument Model: API 100 AH Serial No.: 435
 Fuel Type : Natural Gas Serial No.: 058
 Test Operator : Song H.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)
2:31 PM	14.86	3.31	0.21
2:32 PM	14.84	3.38	0.80
2:33 PM	14.88	3.40	0.26
2:34 PM	14.83	3.36	0.13
2:35 PM	14.81	3.40	0.21
2:36 PM	14.80	3.35	0.21
2:37 PM	14.78	3.42	0.21
2:38 PM	14.79	3.45	0.22
2:39 PM	14.80	3.45	0.22
2:40 PM	14.79	3.41	0.23
2:41 PM	14.89	3.45	0.21
2:42 PM	14.90	3.41	0.21
2:43 PM	14.90	3.46	0.21
2:44 PM	14.91	3.51	0.21
2:45 PM	14.89	3.50	0.21
2:46 PM	14.92	3.45	0.21
2:47 PM	14.97	3.52	0.21
2:48 PM	14.96	3.55	0.21
2:49 PM	14.95	3.50	0.21
2:50 PM	14.97	3.46	0.21
2:51 PM	14.97	3.43	0.21
Average	14.88	3.44	0.24

Signature

(Miss Katesarin Vorradetwittaya)

Environmental Scientist

PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)
EMISSION TEST RESULT

Date: August 29, 2024 Run # : 3
 Start time: 2:52 PM Location : H-3705
 O₂ instrument Model: AMI 70 Finish time : 3:12 PM
 NO_x instrument Model: TELEDYNE 200 EM Serial No.: 161212-14
 SO₂ instrument Model: API 100 AH Serial No.: 435
 Fuel Type : Natural Gas Serial No.: 058
 Test Operator : Song H.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)
2:52 PM	14.92	3.39	0.21
2:53 PM	14.94	3.39	0.21
2:54 PM	14.93	3.44	0.21
2:55 PM	14.91	3.50	0.21
2:56 PM	14.97	3.57	0.21
2:57 PM	14.96	3.45	0.21
2:58 PM	14.90	3.47	0.21
2:59 PM	14.95	3.45	0.21
3:00 PM	14.94	3.52	0.21
3:01 PM	14.95	3.49	0.21
3:02 PM	14.93	3.53	0.21
3:03 PM	14.96	3.46	0.21
3:04 PM	14.98	3.44	0.21
3:05 PM	14.92	3.35	0.21
3:06 PM	15.03	3.43	0.21
3:07 PM	14.92	3.50	0.21
3:08 PM	14.94	3.48	0.25
3:09 PM	14.95	3.41	0.12
3:10 PM	14.94	3.39	0.12
3:11 PM	14.94	3.43	0.52
3:12 PM	14.98	3.44	0.57
Average	14.95	3.45	0.24

Signature

(Miss Katesarin Vorradetwittaya)

Environmental Scientist



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SECOT CO., LTD.

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STACK EMISSION ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Co., Ltd. REF. NO. : 224007_Cert-Stack/PM_Aug 24
Branch 2. Power Plant SAMPLING DATE : 28/08/2024
SAMPLING BY : SECOT Co., Ltd. ANALYTICAL DATE : 04-05/09/2024
RECEIVED DATE : 02/09/2024 SAMPLE CONDITION : Normal
REPORT DATE : 10/09/2024 FUEL TYPE : Natural Gas
SOURCE DESCRIPTION : Combustion STACK LOCATION : H-3706
OPERATOR : Mr. Song Hengohwankul
STACK DESCRIPTION
Height : 35.0 m Gas Velocity : 8.8 m/s
Diameter : 1.80 m Flow Rate* : 853 Ncu.m/min
Temperature : 152.6 °C Excess Oxygen : 5.5 %

PARAMETER	UNITS	RESULTS*			REFERENCE
		5.5%O ₂	7%O ₂	7%O ₂	
					METHODS
Particulate Matter	mg/Ncu.m.	2.45	2.21	60	US. EPA Method 5

Bongpa Pethum

(Miss Pornnape Budthum)

Analyst

REG.NO.7-239-P-0018

Narisa Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO.7-239-P-0010

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

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

3. * At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. ¹ Notification of the Ministry of Industry, B.E.2549 and the Ministry of Natural Resources and Environment. B.E.2549.

The Monitoring Result of Emission Concentration H-3706

PTT Global Chemical Public Co., Ltd.

(Branch 2 : Power Plant I-1)

August 28, 2024

Run Number	Oxygen content (%)		Oxide of Nitrogen (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O ₂	Corrected Gas Conc @7% O ₂
1	5.48	5.50	29.70	29.69	26.80
2	5.50	5.49	28.59	28.58	25.78
3	5.49	5.45	28.27	28.25	25.42
Average	5.49	5.48	28.85	28.84	26.00

Run Number	Oxygen content (%)		Sulfur dioxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O ₂	Corrected Gas Conc @7% O ₂
1	5.48	5.50	0.05	0.02	0.02
2	5.50	5.49	0.04	0.02	0.02
3	5.49	5.45	0.04	0.03	0.03
Average	5.49	5.48	0.05	0.02	0.02

PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)
EMISSION TEST RESULT

Date: August 28, 2024 Run #: 1
 Start time: 2:00 PM Location: H-3706
 O₂ instrument Model: AMI 70 Finish time: 2:20 PM
 NO_x instrument Model: TELEDYNE 200 EM Serial No.: 161212-14
 SO₂ instrument Model: API 100 AH Serial No.: 435
 Fuel Type: Natural Gas Serial No.: 058
 Test Operator: Song H.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)
2:00 PM	5.47	28.44	0.04
2:01 PM	5.49	28.53	0.04
2:02 PM	5.46	28.65	0.04
2:03 PM	5.48	28.74	0.03
2:04 PM	5.53	28.80	0.03
2:05 PM	5.44	29.65	0.05
2:06 PM	5.60	28.85	0.05
2:07 PM	5.54	28.84	0.05
2:08 PM	5.50	29.58	0.05
2:09 PM	5.45	29.76	0.05
2:10 PM	5.46	30.15	0.05
2:11 PM	5.46	30.19	0.05
2:12 PM	5.49	30.40	0.06
2:13 PM	5.48	30.65	0.06
2:14 PM	5.51	30.51	0.06
2:15 PM	5.43	30.44	0.06
2:16 PM	5.48	30.51	0.06
2:17 PM	5.43	30.36	0.06
2:18 PM	5.45	30.29	0.06
2:19 PM	5.39	30.18	0.06
2:20 PM	5.46	30.15	0.05
Average	5.48	29.70	0.05

Signature



(Miss Katesarin Vorradetwittaya)

Environmental Scientist

PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)
EMISSION TEST RESULT

Date: August 28, 2024 Run #: 2
 Start time: 2:21 PM Location: H-3706
 O₂ instrument Model: AMI 70 Finish time: 2:41 PM
 NO_x instrument Model: TELEDYNE 200 EM Serial No.: 161212-14
 SO₂ instrument Model: API 200 AH Serial No.: 435
 Fuel Type: Natural Gas Serial No.: 058
 Test Operator: Song H.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)
2:21 PM	5.53	30.19	0.05
2:22 PM	5.41	30.02	0.05
2:23 PM	5.49	29.93	0.05
2:24 PM	5.62	29.81	0.05
2:25 PM	5.38	29.30	0.04
2:26 PM	5.55	29.26	0.04
2:27 PM	5.56	28.78	0.04
2:28 PM	5.45	28.50	0.04
2:29 PM	5.53	28.52	0.04
2:30 PM	5.51	28.39	0.04
2:31 PM	5.53	28.15	0.04
2:32 PM	5.44	27.95	0.04
2:33 PM	5.46	27.96	0.04
2:34 PM	5.52	27.97	0.04
2:35 PM	5.44	27.91	0.04
2:36 PM	5.50	27.78	0.05
2:37 PM	5.51	27.82	0.05
2:38 PM	5.48	27.90	0.04
2:39 PM	5.63	28.01	0.04
2:40 PM	5.54	28.04	0.04
2:41 PM	5.49	28.01	0.04
Average	5.50	28.59	0.04

Signature



(Miss Katesarin Vorradetwittaya)

Environmental Scientist

PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)

EMISSION TEST RESULT

Date: August 28, 2024
Start time: 2:42 PM
O₂ instrument Model: AMI 70
NO_x instrument Model: TELEDYNE 200 EM
SO₂ instrument Model: API 100 AH
Fuel Type : Natural Gas

Run # : 3
Location : H-3706
Finish time : 3:02 PM
Serial No.: 161212-14
Serial No.: 435
Serial No.: 058
Test Operator : Song H.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)
2:42 PM	5.50	28.02	0.04
2:43 PM	5.52	28.20	0.05
2:44 PM	5.46	28.21	0.05
2:45 PM	5.50	28.14	0.04
2:46 PM	5.49	28.24	0.05
2:47 PM	5.50	28.23	0.05
2:48 PM	5.58	28.02	0.05
2:49 PM	5.45	27.99	0.05
2:50 PM	5.44	28.14	0.05
2:51 PM	5.47	28.29	0.04
2:52 PM	5.52	28.47	0.04
2:53 PM	5.51	28.51	0.04
2:54 PM	5.48	28.46	0.04
2:55 PM	5.44	28.21	0.04
2:56 PM	5.50	28.15	0.04
2:57 PM	5.49	28.27	0.04
2:58 PM	5.57	28.43	0.04
2:59 PM	5.48	28.51	0.03
3:00 PM	5.51	28.43	0.03
3:01 PM	5.48	28.40	0.03
3:02 PM	5.45	28.37	0.04
Average	5.49	28.27	0.04

Signature

(Miss Katesarin Vorradetwittaya)

Environmental Scientist



บริษัท ซีคอต จำกัด

SECOT CO., LTD.

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STACK EMISSION ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Co., Ltd. **REF. NO. :** 224007_Cert-Stack/PM_Aug 24
Branch 2, Power Plant **SAMPLING DATE :** 28/08/2024
SAMPLING BY : SECOT Co., Ltd. **ANALYTICAL DATE :** 04-05/09/2024
RECEIVED DATE : 02/09/2024 **SAMPLE CONDITION :** Normal
REPORT DATE : 10/09/2024 **FUEL TYPE :** Natural Gas
SOURCE DESCRIPTION : Combustion **STACK LOCATION :** H-3707
OPERATOR : Mr. Song Hengchwankul

STACK DESCRIPTION

Height : 35.0 m **Gas Velocity :** 8.0 m/s
Diameter : 1.80 m **Flow Rate* :** 770 Ncu.m/min
Temperature : 150.1 °C **Excess Oxygen :** 5.5 %

PARAMETER	UNITS	RESULTS*		STANDARDS ^{1/}	REFERENCE
		5.5%O ₂	7%O ₂	7%O ₂	METHODS
Particulate Matter	mg/Ncu.m.	3.09	2.79	60	US, EPA Method 5

(Miss Pornnapa Budthum)

Analyst

REG.NO. 7-239-ก-0018

(Miss Narisa Poowasanpeich)

Technical Management Team

REG.NO. 7-239-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. * At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. ^{1/} Notification of the Ministry of Industry, B.E.2549 and the Ministry of Natural Resources and Environment. B.E.2549.

**The Monitoring Result of Emission Concentration
H-3707**

PTT Global Chemical Public Co., Ltd.

(Branch 2 : Power Plant I-1)

August 28, 2024

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	5.22	5.24	25.76	25.74	22.85
2	5.63	5.64	25.90	25.88	23.57
3	5.67	5.66	26.10	26.09	23.80
Average	5.51	5.51	25.92	25.90	23.40

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	5.22	5.24	0.15	0.10	0.09
2	5.63	5.64	0.13	0.09	0.08
3	5.67	5.66	0.16	0.13	0.12
Average	5.51	5.51	0.15	0.11	0.10

**PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)
EMISSION TEST RESULT**

Date: August 28, 2024

Start time: 2:00 PM

O₂ instrument Model: AMI 70

NO_x instrument Model: TELEDYNE 200 EM

SO₂ instrument Model: THERMO 43 C

Fuel Type : Natural Gas

Run # : 1

Location : H-3707

Finish time : 2:20 PM

Serial No.: 121121-10

Serial No.: 433

Serial No.: 58702-319

Test Operator : Song H.

Time. min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)
2:00 PM	5.36	25.62	0.12
2:01 PM	5.32	25.74	0.12
2:02 PM	5.29	25.87	0.12
2:03 PM	5.28	25.95	0.12
2:04 PM	5.25	25.44	0.12
2:05 PM	5.25	25.54	0.12
2:06 PM	5.27	25.62	0.12
2:07 PM	5.23	25.71	0.12
2:08 PM	5.23	25.87	0.12
2:09 PM	5.23	25.99	0.12
2:10 PM	5.23	25.98	0.12
2:11 PM	5.19	25.93	0.12
2:12 PM	5.16	25.89	0.17
2:13 PM	5.18	25.91	0.11
2:14 PM	5.18	25.94	0.49
2:15 PM	5.17	25.87	0.12
2:16 PM	5.18	25.79	0.10
2:17 PM	5.16	25.69	0.06
2:18 PM	5.14	25.57	0.44
2:19 PM	5.15	25.52	0.12
2:20 PM	5.14	25.55	0.13
Average	5.22	25.76	0.15

Signature



(Miss Katesarin Vorradevittaya)

Environmental Scientist

PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)
EMISSION TEST RESULT

Date: August 28, 2024
Start time: 2:21 PM
O₂ instrument Model: AMI 70
NO_x instrument Model: TELEDYNE 200 EM
SO₂ instrument Model: THERMO 43 C
Fuel Type : Natural Gas

Run # : 2
Location : H-3707
Finish time : 2:41 PM
Serial No.: 121121-10
Serial No.: 433
Serial No.: 58702-319
Test Operator : Song H.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)
2:21 PM	5.16	25.68	0.22
2:22 PM	5.56	25.89	0.13
2:23 PM	5.67	26.15	0.13
2:24 PM	5.68	26.09	0.13
2:25 PM	5.69	25.97	0.13
2:26 PM	5.67	25.89	0.13
2:27 PM	5.66	25.84	0.13
2:28 PM	5.68	25.87	0.13
2:29 PM	5.63	25.95	0.13
2:30 PM	5.65	25.87	0.13
2:31 PM	5.64	25.77	0.13
2:32 PM	5.62	25.71	0.13
2:33 PM	5.65	25.83	0.13
2:34 PM	5.64	25.94	0.13
2:35 PM	5.65	25.99	0.13
2:36 PM	5.66	25.98	0.13
2:37 PM	5.67	25.97	0.13
2:38 PM	5.69	25.95	0.13
2:39 PM	5.66	25.90	0.13
2:40 PM	5.66	25.84	0.13
2:41 PM	5.66	25.85	0.13
Average	5.63	25.90	0.13

Signature



(Miss Katesarin Vorradetwittaya)

Environmental Scientist

PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)
EMISSION TEST RESULT

Date: August 28, 2024
Start time: 2:42 PM
O₂ instrument Model: AMI 70
NO_x instrument Model: TELEDYNE 200 EM
SO₂ instrument Model: THERMO 43 C
Fuel Type : Natural Gas

Run # : 3
Location : H-3707
Finish time : 3:02 PM
Serial No.: 121121-10
Serial No.: 433
Serial No.: 58702-319
Test Operator : Song H.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)
2:42 PM	5.66	25.86	0.13
2:43 PM	5.68	25.94	0.13
2:44 PM	5.66	26.00	0.13
2:45 PM	5.66	25.98	0.13
2:46 PM	5.66	25.92	0.13
2:47 PM	5.67	25.97	0.13
2:48 PM	5.67	25.97	0.13
2:49 PM	5.66	25.96	0.13
2:50 PM	5.65	26.76	0.13
2:51 PM	5.66	26.06	0.13
2:52 PM	5.66	25.99	0.13
2:53 PM	5.67	26.07	0.13
2:54 PM	5.70	26.18	0.13
2:55 PM	5.68	26.19	0.13
2:56 PM	5.68	26.14	0.07
2:57 PM	5.66	26.14	0.38
2:58 PM	5.66	26.24	0.28
2:59 PM	5.66	26.22	0.37
3:00 PM	5.66	26.19	0.38
3:01 PM	5.68	26.16	0.04
3:02 PM	5.67	26.21	0.08
Average	5.67	26.10	0.16

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 : PTT Global Chemical Public Co., Ltd. REF. NO. : 224007_Cert-Stack/PM_Aug 24
Branch 2, Power Plant SAMPLING DATE : 29/08/2024
SAMPLING BY : SECOT Co., Ltd. ANALYTICAL DATE : 04-05/09/2024
RECEIVED DATE : 02/09/2024 SAMPLE CONDITION : Normal
REPORT DATE : 10/09/2024 FUEL TYPE : Natural Gas
SOURCE DESCRIPTION : Combustion STACK LOCATION : H-3708
OPERATOR : Mr. Kittipong Thakoengsuk
STACK DESCRIPTION
Height : 35.0 m Gas Velocity : 18.9 m/s
Diameter : 3.26 m Flow Rate* : 5,794 Nm³/min
Temperature : 155.8 °C Excess Oxygen : 14.1 %

PARAMETER	UNITS	RESULTS*		STANDARDS ^{1/}	REFERENCE
		14.1%O ₂	7%O ₂	7%O ₂	METHODS
Particulate Matter	mg/Ncu.m.	3.98	8.13	60	US. EPA Method 5


(Miss Pormnapa Budthum)

Analyst

REG.NO.7-239-ท-0018


(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO.7-239-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. * At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. ^{1/} Notification of the Ministry of Industry, B.E.2549 and the Ministry of Natural Resources and Environment, B.E.2549.

The Monitoring Result of Emission Concentration

H-3708

PTT Global Chemical Public Co., Ltd.

(Branch 2 : Power Plant I-1)

August 29, 2024

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	13.52	14.07	2.89	3.00	6.11
2	14.20	14.09	3.22	3.21	6.55
3	14.22	14.11	3.58	3.57	7.31
Average	13.98	14.09	3.23	3.26	6.65

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	13.52	14.07	0.22	0.16	0.33
2	14.20	14.09	0.35	0.28	0.57
3	14.22	14.11	0.38	0.32	0.66
Average	13.98	14.09	0.32	0.25	0.52

PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)
EMISSION TEST RESULT

Run # : 1
 Date: August 29, 2024
 Start time: 12:00 AM
 O₂ instrument Model: AMI 70
 NO_x instrument Model: THERMO 42 C
 SO₂ instrument Model: TELEDYNE 100 EH
 Fuel Type : Natural Gas

Location : H-3708
 Finish time: 12:20 AM
 Serial No.: 071023-47
 Serial No.: 71302119
 Serial No.: 186
 Test Operator : Kittipong T.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)
12:00 AM	0.00	0.00	0.00
12:01 AM	14.14	3.03	0.26
12:02 AM	14.21	3.03	0.26
12:03 AM	14.18	3.03	0.26
12:04 AM	14.19	3.03	0.23
12:05 AM	14.18	3.03	0.25
12:06 AM	14.18	3.03	0.23
12:07 AM	14.20	3.03	0.26
12:08 AM	14.19	3.03	0.23
12:09 AM	14.18	3.03	0.25
12:10 AM	14.19	3.03	0.24
12:11 AM	14.20	3.03	0.22
12:12 AM	14.19	3.03	0.22
12:13 AM	14.21	3.03	0.19
12:14 AM	14.20	3.03	0.16
12:15 AM	14.18	3.03	0.15
12:16 AM	14.23	3.10	0.18
12:17 AM	14.19	3.03	0.20
12:18 AM	14.21	3.03	0.21
12:19 AM	14.18	3.03	0.31
12:20 AM	14.20	3.03	0.36
Average	13.52	2.89	0.22

Signature



(Miss Katesarin Vorraderwittaya)

Environmental Scientist

PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)
EMISSION TEST RESULT

Run # : 2
 Date: August 29, 2024
 Start time: 12:21 AM
 O₂ instrument Model: AMI 70
 NO_x instrument Model: THERMO 42 C
 SO₂ instrument Model: TELEDYNE 100 EH
 Fuel Type : Natural Gas

Location : H-3708
 Finish time: 12:41 AM
 Serial No.: 071023-47
 Serial No.: 71302119
 Serial No.: 186
 Test Operator : Kittipong T.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)
12:21 AM	14.20	3.03	0.35
12:22 AM	14.19	3.03	0.37
12:23 AM	14.20	3.03	0.36
12:24 AM	14.20	3.03	0.36
12:25 AM	14.20	3.11	0.36
12:26 AM	14.20	3.05	0.36
12:27 AM	14.21	3.23	0.36
12:28 AM	14.19	3.35	0.36
12:29 AM	14.22	3.31	0.36
12:30 AM	14.19	3.35	0.35
12:31 AM	14.20	3.18	0.35
12:32 AM	14.20	3.03	0.34
12:33 AM	14.21	3.03	0.36
12:34 AM	14.20	3.15	0.34
12:35 AM	14.21	3.34	0.36
12:36 AM	14.20	3.28	0.35
12:37 AM	14.19	3.43	0.34
12:38 AM	14.21	3.43	0.34
12:39 AM	14.20	3.43	0.34
12:40 AM	14.21	3.43	0.34
12:41 AM	14.22	3.42	0.35
Average	14.20	3.22	0.35

Signature



(Miss Katesarin Vorraderwittaya)

Environmental Scientist

PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)

EMISSION TEST RESULT

Date: August 29, 2024
 Start time: 12:42 AM
 O₂ instrument Model: AMI 70
 NO_x instrument Model: THERMO 42 C
 SO₂ instrument Model: TELEDYNE 100 EH
 Fuel Type : Natural Gas

Run #: 3
 Location : H-3708
 Finish time : 1:02 AM
 Serial No.: 071023-47
 Serial No.: 71302119
 Serial No.: 186
 Test Operator : Kittipong T.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)
12:42 AM	14.20	3.43	0.34
12:43 AM	14.20	3.42	0.34
12:44 AM	14.21	3.42	0.34
12:45 AM	14.20	3.42	0.34
12:46 AM	14.23	3.41	0.34
12:47 AM	14.21	3.42	0.33
12:48 AM	14.21	3.42	0.34
12:49 AM	14.23	3.43	0.39
12:50 AM	14.23	3.43	0.37
12:51 AM	14.23	3.55	0.37
12:52 AM	14.21	3.44	0.37
12:53 AM	14.22	3.53	0.40
12:54 AM	14.22	3.44	0.40
12:55 AM	14.23	3.71	0.40
12:56 AM	14.22	3.83	0.40
12:57 AM	14.22	3.83	0.40
12:58 AM	14.23	3.83	0.40
12:59 AM	14.22	3.83	0.40
1:00 AM	14.24	3.83	0.42
1:01 AM	14.22	3.83	0.42
1:02 AM	14.24	3.83	0.42
Average	14.22	3.58	0.38

Signature

(Miss Katesarin Vorradetwittaya)

Environmental Scientist



บริษัท ซีคอต จำกัด

SECOT CO., LTD.

239 ถนนวิภาวดีรังสิต แขวงบางซื่อ เขตบางซื่อ กรุงเทพฯ 10800

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STACK EMISSION ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Co., Ltd. REF. NO. : 224007 Cert-Stack/PM_Aug 24
 Branch 2, Power Plant SAMPLING DATE : 29/08/2024
 SAMPLING BY : SECOT Co., Ltd. ANALYTICAL DATE : 04-05/09/2024
 RECEIVED DATE : 02/09/2024 SAMPLE CONDITION : Normal
 REPORT DATE : 10/09/2024 FUEL TYPE : Natural Gas
 SOURCE DESCRIPTION : Combustion STACK LOCATION : H-3709
 OPERATOR : Mr. Kittipong Thakoengsuk
 STACK DESCRIPTION :

Height : 35.0 m Gas Velocity : 26.1 m/s
 Diameter : 3.26 m Flow Rate* : 7,602 Ncu.m/min
 Temperature : 180.4 °C Excess Oxygen : 14.9 %

PARAMETER	UNITS	RESULTS*		STANDARDS ^{1/}	REFERENCE METHODS
		14.9%O ₂	7%O ₂	7%O ₂	
Particulate Matter	mg/Ncu.m.	1.88	4.36	60	US, EPA Method 5

(Miss Pornnapa Budthum)

Analyst

REG.NO.7-239-0-0018

(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO.7-239-0-0010

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

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

3. * At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. ^{1/} Notification of the Ministry of Industry, B.E.2549 and the Ministry of Natural Resources and Environment, B.E.2549.

**The Monitoring Result of Emission Concentration
H-3709**

PTT Global Chemical Public Co., Ltd.

(Branch 2 : Power Plant I-1)

August 29, 2024

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	14.97	14.86	5.03	5.00	11.51
2	15.02	14.91	5.05	5.02	11.65
3	15.02	14.91	5.25	5.21	12.09
Average	15.00	14.89	5.11	5.08	11.75

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	14.97	14.86	0.43	0.38	0.87
2	15.02	14.91	0.47	0.41	0.95
3	15.02	14.91	0.44	0.38	0.88
Average	15.00	14.89	0.45	0.39	0.90

**PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)
EMISSION TEST RESULT**

Date: August 29, 2024
 Start time: 1:30 PM
 O₂ instrument Model: AMI 70
 NO_x instrument Model: THERMO 42 C
 SO₂ instrument Model: TELEDYNE 100 EH
 Fuel Type : Natural Gas

Run # : 1
 Location : H-3709
 Finish time : 1:50 PM
 Serial No.: 071023-47
 Serial No.: 71302119
 Serial No.: 145
 Test Operator : Kittipong T.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)
1:30 PM	14.95	5.03	0.41
1:31 PM	14.94	5.03	0.41
1:32 PM	14.93	5.03	0.42
1:33 PM	14.92	5.03	0.43
1:34 PM	14.94	5.03	0.42
1:35 PM	14.94	5.03	0.42
1:36 PM	14.95	5.03	0.43
1:37 PM	14.97	5.03	0.42
1:38 PM	14.97	5.03	0.41
1:39 PM	14.97	5.03	0.42
1:40 PM	14.97	5.03	0.42
1:41 PM	14.98	5.03	0.43
1:42 PM	15.00	5.03	0.42
1:43 PM	15.00	5.03	0.45
1:44 PM	15.00	5.03	0.45
1:45 PM	15.00	5.03	0.45
1:46 PM	15.00	5.01	0.44
1:47 PM	15.00	4.98	0.45
1:48 PM	15.00	5.03	0.45
1:49 PM	15.02	5.03	0.44
1:50 PM	15.01	5.03	0.44
Average	14.97	5.03	0.43

Signature



(Miss Katesarin Vorradetwittaya)

Environmental Scientist

PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)
EMISSION TEST RESULT

Date: August 29, 2024 Run # : 2
 Start time: 1:51 PM Location : H-3709
 O₂ instrument Model: AMI 70 Finish time : 2:11 PM
 NO_x instrument Model: THERMO 42 C Serial No.: 071023-47
 SO₂ instrument Model: TELEDYNE 100 EH Serial No.: 71302119
 Fuel Type : Natural Gas Serial No.: 145
 Test Operator : Kittipong T.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)
1:51 PM	15.00	5.03	0.44
1:52 PM	15.00	4.93	0.47
1:53 PM	15.02	5.03	0.47
1:54 PM	15.03	5.03	0.48
1:55 PM	15.03	5.03	0.46
1:56 PM	15.03	5.03	0.47
1:57 PM	15.03	5.03	0.48
1:58 PM	15.02	5.03	0.48
1:59 PM	15.02	5.03	0.48
2:00 PM	15.02	5.14	0.47
2:01 PM	15.02	5.28	0.48
2:02 PM	15.02	5.10	0.47
2:03 PM	15.02	5.03	0.48
2:04 PM	15.02	5.03	0.48
2:05 PM	15.02	5.03	0.47
2:06 PM	15.02	5.03	0.47
2:07 PM	15.02	5.03	0.47
2:08 PM	15.02	5.03	0.46
2:09 PM	15.02	5.03	0.44
2:10 PM	15.02	5.03	0.44
2:11 PM	15.02	5.03	0.44
Average	15.02	5.05	0.47

Signature

(Miss Katesarin Vorradetwittaya)

Environmental Scientist

PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)
EMISSION TEST RESULT

Date: August 29, 2024 Run # : 3
 Start time: 2:12 PM Location : H-3709
 O₂ instrument Model: AMI 70 Finish time : 2:32 PM
 NO_x instrument Model: THERMO 42 C Serial No.: 071023-47
 SO₂ instrument Model: TELEDYNE 100 EH Serial No.: 71302119
 Fuel Type : Natural Gas Serial No.: 145
 Test Operator : Kittipong T.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)
2:12 PM	15.02	5.03	0.44
2:13 PM	15.02	5.03	0.44
2:14 PM	15.02	5.32	0.44
2:15 PM	15.02	5.42	0.44
2:16 PM	15.02	5.32	0.44
2:17 PM	15.02	5.02	0.44
2:18 PM	15.02	5.03	0.44
2:19 PM	15.02	5.19	0.44
2:20 PM	15.02	5.42	0.44
2:21 PM	15.02	5.25	0.44
2:22 PM	15.02	5.42	0.44
2:23 PM	15.02	5.42	0.44
2:24 PM	15.02	5.36	0.44
2:25 PM	15.02	5.04	0.44
2:26 PM	15.02	5.40	0.44
2:27 PM	15.02	5.41	0.44
2:28 PM	15.02	5.08	0.45
2:29 PM	15.02	5.25	0.44
2:30 PM	15.02	5.41	0.46
2:31 PM	15.02	5.33	0.44
2:32 PM	15.02	5.09	0.45
Average	15.02	5.25	0.44

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 : PTT Global Chemical Public Co., Ltd. REF. NO. : 224007_Cert-Stack/PM_Aug 24
Branch 2, Power Plant SAMPLING DATE : 30/08/2024
SAMPLING BY : SECOT Co., Ltd. ANALYTICAL DATE : 04-05/09/2024
RECEIVED DATE : 02/09/2024 SAMPLE CONDITION : Normal
REPORT DATE : 10/09/2024 FUEL TYPE : Natural Gas
SOURCE DESCRIPTION : Combustion STACK LOCATION : H-3710
OPERATOR : Mr. Kittipong Thakoengsuk
STACK DESCRIPTION
Height : 35.0 m Gas Velocity : 22.9 m/s
Diameter : 3.26 m Flow Rate* : 6,647 Ncu.m/min
Temperature : 186.8 °C Excess Oxygen : 15.7 %

PARAMETER	UNITS	RESULTS*			REFERENCE
		15.7%O ₂	7%O ₂	7%O ₂	
					METHODS
Particulate Matter	mg/Ncu.m.	2.14	5.71	60	US. EPA Method 5



(Miss Pornnapa Buddhum)

Analyst

REG.NO.7-239-B-0018



(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO.7-239-B-0010

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

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

3. * At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. ^{1/} Notification of the Ministry of Industry, B.E.2549 and the Ministry of Natural Resources and Environment, B.E.2549.

The Monitoring Result of Emission Concentration H-3710

PTT Global Chemical Public Co., Ltd.

(Branch 2 : Power Plant I-1)

August 30, 2024

Run Number	Oxygen content (%)		Oxide of Nitrogen (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O ₂	Corrected Gas Conc @7% O ₂
1	15.62	15.62	2.63	2.58	6.79
2	15.71	15.72	2.43	2.38	6.39
3	15.74	15.76	2.50	2.45	6.63
Average	15.69	15.70	2.52	2.47	6.60

Run Number	Oxygen content (%)		Sulfur dioxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O ₂	Corrected Gas Conc @7% O ₂
1	15.62	15.62	0.36	0.29	0.76
2	15.71	15.72	0.06	0.01	0.03
3	15.74	15.76	0.26	0.19	0.51
Average	15.69	15.70	0.22	0.16	0.44

PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)
EMISSION TEST RESULT

Date: August 30, 2024 Run # : 1
 Start time: 10:40 AM Location : H-3710
 O₂ instrument Model: AMI 70 Finish time : 11:00 AM
 NO_x instrument Model: THERMO 42 C Serial No.: 071023-47
 SO₂ instrument Model: TELEDYNE 100 EH Serial No.: 71302119
 Fuel Type : Natural Gas Serial No.: 186
 Test Operator : Kittipong T.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)
10:40 AM	15.44	2.31	0.69
10:41 AM	15.46	2.17	0.69
10:42 AM	15.58	2.14	0.67
10:43 AM	15.63	2.54	0.65
10:44 AM	15.58	2.57	0.63
10:45 AM	15.59	2.54	0.63
10:46 AM	15.59	2.54	0.62
10:47 AM	15.64	2.54	0.60
10:48 AM	15.62	2.54	0.60
10:49 AM	15.44	2.61	0.44
10:50 AM	15.55	2.67	0.14
10:51 AM	15.62	2.54	0.14
10:52 AM	15.51	2.60	0.14
10:53 AM	15.53	3.07	0.14
10:54 AM	15.63	2.94	0.11
10:55 AM	15.81	2.97	0.12
10:56 AM	15.80	3.11	0.11
10:57 AM	15.96	2.94	0.11
10:58 AM	15.78	3.01	0.07
10:59 AM	15.71	2.54	0.09
11:00 AM	15.54	2.43	0.09
Average	15.62	2.63	0.36

Signature



(Miss Katesarin Vorradetwittaya)

Environmental Scientist

PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)
EMISSION TEST RESULT

Date: August 30, 2024 Run # : 2
 Start time: 11:01 AM Location : H-3710
 O₂ instrument Model: AMI 70 Finish time : 11:21 AM
 NO_x instrument Model: THERMO 42 C Serial No.: 071023-47
 SO₂ instrument Model: TELEDYNE 100 EH Serial No.: 71302119
 Fuel Type : Natural Gas Serial No.: 186
 Test Operator : Kittipong T.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)
11:01 AM	15.64	2.43	0.08
11:02 AM	15.68	2.43	0.06
11:03 AM	15.84	2.43	0.07
11:04 AM	15.76	2.43	0.06
11:05 AM	15.52	2.43	0.04
11:06 AM	15.44	2.43	0.03
11:07 AM	15.67	2.43	0.02
11:08 AM	15.62	2.43	0.02
11:09 AM	15.70	2.43	0.03
11:10 AM	15.78	2.43	0.01
11:11 AM	15.68	2.43	0.01
11:12 AM	15.62	2.43	0.01
11:13 AM	15.57	2.43	0.01
11:14 AM	15.60	2.43	0.01
11:15 AM	15.81	2.43	0.00
11:16 AM	15.87	2.43	0.03
11:17 AM	15.89	2.43	0.03
11:18 AM	15.97	2.44	0.02
11:19 AM	15.85	2.34	0.09
11:20 AM	15.74	2.44	0.29
11:21 AM	15.60	2.44	0.29
Average	15.71	2.43	0.06

Signature



(Miss Katesarin Vorradetwittaya)

Environmental Scientist

PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)

EMISSION TEST RESULT

Date: August 30, 2024
Start time: 11:22 AM
O₂ instrument Model: AMI 70
NO_x instrument Model: THERMO 42 C
SO₂ instrument Model: TELEDYNE 100 EH
Fuel Type : Natural Gas

Run # : 3
Location : H-3710
Finish time : 11:42 AM
Serial No.: 071023-47
Serial No.: 71302119
Serial No.: 186
Test Operator : Kittipong T.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)
11:22 AM	15.55	2.45	0.29
11:23 AM	15.60	2.61	0.29
11:24 AM	15.69	2.44	0.29
11:25 AM	15.62	2.45	0.29
11:26 AM	15.56	2.58	0.29
11:27 AM	15.62	2.61	0.28
11:28 AM	15.82	2.45	0.26
11:29 AM	15.94	2.28	0.27
11:30 AM	15.62	2.51	0.26
11:31 AM	15.66	2.72	0.26
11:32 AM	15.89	2.51	0.26
11:33 AM	15.87	2.45	0.25
11:34 AM	15.67	2.58	0.25
11:35 AM	15.83	2.58	0.24
11:36 AM	15.89	2.31	0.24
11:37 AM	15.96	2.38	0.24
11:38 AM	15.78	2.35	0.24
11:39 AM	15.67	2.61	0.24
11:40 AM	15.74	2.55	0.24
11:41 AM	15.78	2.45	0.22
11:42 AM	15.76	2.58	0.24
Average	15.74	2.50	0.26

Signature

(Miss Katesarin Vorradevittaya)

Environmental Scientist



บริษัท ซีคอต จำกัด

SECOT CO., LTD.

239 ถนนเริ่มคองประปา 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

STACK EMISSION ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Co., Ltd. **REF. NO. :** 224007 Cert-Stack/PM Aug 24
Branch 2, Power Plant
SAMPLING DATE : 30/08/2024
SAMPLING BY : SECOT Co., Ltd. **ANALYTICAL DATE :** 04-05/09/2024
RECEIVED DATE : 02/09/2024 **SAMPLE CONDITION :** Normal
REPORT DATE : 10/09/2024 **FUEL TYPE :** Natural Gas
SOURCE DESCRIPTION : Combustion **STACK LOCATION :** H-3711
OPERATOR : Mr. Kittipong Thakoengsuk

STACK DESCRIPTION
Height : 35.0 m **Gas Velocity :** 19.4 m/s
Diameter : 3.26 m **Flow Rate* :** 6,232 Ncu.m/min
Temperature : 135.0 °C **Excess Oxygen :** 13.8 %

PARAMETER	UNITS	RESULTS*		STANDARDS ^{1/}	REFERENCE
		13.8%O ₂	7%O ₂	7%O ₂	METHODS
Particulate Matter	mg/Ncu.m	4.30	8.40	60	US, EPA Method 5

(Miss Pornnapa Budthum)

Analyst

REG.NO.7-239-0-0018

(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO.7-239-0-0010

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

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

3. * At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. ^{1/} Notification of the Ministry of Industry, B.E.2549 and the Ministry of Natural Resources and Environment, B.E.2549.

**The Monitoring Result of Emission Concentration
H-3711**

PTT Global Chemical Public Co., Ltd.

(Branch 2 : Power Plant I-1)

August 30, 2024

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	13.77	13.78	3.73	3.68	7.18
2	13.78	13.79	3.85	3.80	7.43
3	13.77	13.78	3.80	3.74	7.30
Average	13.77	13.78	3.79	3.74	7.30

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	13.77	13.78	0.10	0.03	0.06
2	13.78	13.79	0.11	0.04	0.08
3	13.77	13.78	0.10	0.04	0.08
Average	13.77	13.78	0.10	0.04	0.07

**PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)
EMISSION TEST RESULT**

Date: August 30, 2024

Start time: 12:50 PM

O₂ instrument Model: AMI 70

NO_x instrument Model: THERMO 42 C

SO₂ instrument Model: TELEDYNE 100 EH

Fuel Type : Natural Gas

Run # : 1

Location : H-3711

Finish time : 1:10 PM

Serial No.: 071023-47

Serial No.: 71302119

Serial No.: 145

Test Operator : Kittipong T.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)
12:50 PM	13.78	3.85	0.11
12:51 PM	13.79	3.82	0.11
12:52 PM	13.79	3.68	0.11
12:53 PM	13.82	3.75	0.11
12:54 PM	13.81	3.45	0.11
12:55 PM	13.80	3.45	0.11
12:56 PM	13.77	3.45	0.11
12:57 PM	13.72	3.45	0.11
12:58 PM	13.74	3.65	0.11
12:59 PM	13.72	3.65	0.11
1:00 PM	13.75	3.65	0.07
1:01 PM	13.77	3.65	0.02
1:02 PM	13.78	3.65	0.11
1:03 PM	13.82	3.65	0.11
1:04 PM	13.85	3.80	0.11
1:05 PM	13.72	3.85	0.11
1:06 PM	13.70	4.04	0.11
1:07 PM	13.73	4.05	0.11
1:08 PM	13.74	4.00	0.11
1:09 PM	13.75	3.92	0.11
1:10 PM	13.76	3.85	0.11
Average	13.77	3.73	0.10

Signature



(Miss Katesarin Vorradetwittaya)

Environmental Scientist

PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)
EMISSION TEST RESULT

Date: August 30, 2024 Run # : 2
 Start time: 1:11 PM Location : H-3711
 O₂ instrument Model: AMI 70 Finish time : 1:31 PM
 NO_x instrument Model: THERMO 42 C Serial No.: 071023-47
 SO₂ instrument Model: TELEDYNE 100 EH Serial No.: 71302119
 Fuel Type : Natural Gas Test Operator : Kittipong T.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)
1:11 PM	13.77	3.89	0.11
1:12 PM	13.77	3.85	0.11
1:13 PM	13.77	3.85	0.11
1:14 PM	13.79	3.85	0.11
1:15 PM	13.77	3.85	0.11
1:16 PM	13.76	3.85	0.11
1:17 PM	13.77	3.85	0.11
1:18 PM	13.78	3.85	0.11
1:19 PM	13.78	3.85	0.11
1:20 PM	13.77	3.85	0.11
1:21 PM	13.80	3.85	0.11
1:22 PM	13.79	3.85	0.11
1:23 PM	13.77	3.85	0.10
1:24 PM	13.77	3.85	0.10
1:25 PM	13.77	3.85	0.10
1:26 PM	13.78	3.85	0.10
1:27 PM	13.80	3.85	0.10
1:28 PM	13.80	3.85	0.10
1:29 PM	13.80	3.85	0.10
1:30 PM	13.79	3.85	0.10
1:31 PM	13.79	3.85	0.10
Average	13.78	3.85	0.11

Signature



(Miss Katesarin Vorradeewittaya)

Environmental Scientist

PTT Global Chemical Public Co., Ltd. (Branch 2 : Power Plant I-1)
EMISSION TEST RESULT

Date: August 30, 2024 Run # : 3
 Start time: 1:32 PM Location : H-3711
 O₂ instrument Model: AMI 70 Finish time : 1:52 PM
 NO_x instrument Model: THERMO 42 C Serial No.: 071023-47
 SO₂ instrument Model: TELEDYNE 100 EH Serial No.: 71302119
 Fuel Type : Natural Gas Test Operator : Kittipong T.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)
1:32 PM	13.78	3.85	0.10
1:33 PM	13.76	3.85	0.10
1:34 PM	13.79	3.85	0.10
1:35 PM	13.78	3.85	0.10
1:36 PM	13.80	3.85	0.10
1:37 PM	13.79	3.94	0.10
1:38 PM	13.79	3.85	0.10
1:39 PM	13.78	3.83	0.10
1:40 PM	13.78	4.00	0.10
1:41 PM	13.78	3.86	0.10
1:42 PM	13.77	3.85	0.10
1:43 PM	13.79	3.85	0.10
1:44 PM	13.79	3.85	0.10
1:45 PM	13.77	3.86	0.10
1:46 PM	13.77	4.00	0.10
1:47 PM	13.78	3.85	0.10
1:48 PM	13.76	3.85	0.11
1:49 PM	13.74	3.65	0.11
1:50 PM	13.73	3.45	0.11
1:51 PM	13.75	3.45	0.11
1:52 PM	13.70	3.37	0.11
Average	13.77	3.80	0.10

Signature



(Miss Katesarin Vorradeewittaya)

Environmental Scientist

ภาคผนวก ง.2

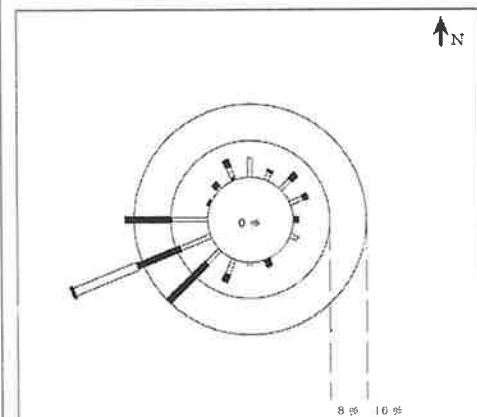
ใบรับรองผลการตรวจวิเคราะห์คุณภาพอากาศในบรรยากาศ



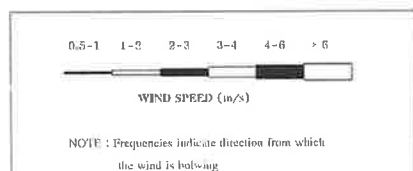
Meteorological Monitoring Results : Wind Rose MTR-PTTGC, Branch 2 (Power Plant)

Location : North Fence Monitor period : 27 Aug 2024-03 Sep 2024
Wind Speed Model : Scarlet WS-21 Serial No : AD:66
Wind Direction Model : Scarlet WS-21 Serial No : AD:66

Direction	Percentage of Occurrence of Wind Direct Grouped in Various Wind Speed						Total
	0.5-1 m/s	1-2 m/s	2-3 m/s	3-4 m/s	4-6 m/s	More than 6	
N	0.0000	0.0417	0.0000	0.0000	0.0000	0.0000	0.0417
NNE	0.0000	0.0179	0.0060	0.0000	0.0000	0.0000	0.0238
NE	0.0000	0.0298	0.0179	0.0000	0.0000	0.0000	0.0476
ENE	0.0000	0.0298	0.0119	0.0000	0.0000	0.0000	0.0417
E	0.0000	0.0000	0.0119	0.0000	0.0000	0.0000	0.0119
ESE	0.0000	0.0179	0.0000	0.0000	0.0000	0.0000	0.0179
SE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SSE	0.0000	0.0000	0.0179	0.0000	0.0000	0.0000	0.0179
S	0.0000	0.0060	0.0000	0.0000	0.0000	0.0000	0.0060
SSW	0.0000	0.0357	0.0179	0.0000	0.0000	0.0000	0.0536
SW	0.0000	0.0417	0.1190	0.0000	0.0000	0.0000	0.1607
WSW	0.0000	0.0714	0.1012	0.1488	0.0060	0.0000	0.3274
W	0.0000	0.0774	0.1012	0.0000	0.0000	0.0000	0.1786
WNW	0.0000	0.0000	0.0060	0.0000	0.0000	0.0000	0.0060
NW	0.0000	0.0060	0.0119	0.0000	0.0000	0.0000	0.0179
NNW	0.0060	0.0238	0.0179	0.0000	0.0000	0.0000	0.0476
CALM	0.0000						



Application : WindPro Ver.1.0
Control : 16 Direction Calculation With
Calm Wind < 0.5 m/s
Data Unit : Direction in Deg.
Wind Speed in m/s



NOTE : Frequencies indicate direction from which the wind is blowing

File Control : R:\Database\Windrose\File\Control\Win-224007-North Fence 27 Aug 2024-03 Sep 2024

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose MTR-PTTGC, Branch 2 (Power Plant)

Location : North Fence Monitor period : 27 Aug 2024-03 Sep 2024
Wind Speed Model : Scarlet WS-21 Serial No : AD:66
Wind Direction Model : Scarlet WS-21 Serial No : AD:66

Time	27-28 Aug 2024		28-29 Aug 2024		29-30 Aug 2024		30-31 Aug 2024	
	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD
11:00 - 12:00	1.8	SSW	2.5	SW	1.7	SSW	3.9	WSW
12:00 - 13:00	1.6	SW	3.6	WSW	2.0	SW	3.9	WSW
13:00 - 14:00	2.0	SSW	2.9	WSW	3.2	WSW	2.4	SW
14:00 - 15:00	1.9	SSW	2.8	WSW	3.1	WSW	2.3	WSW
15:00 - 16:00	2.1	SW	2.7	SW	3.4	WSW	1.2	WSW
16:00 - 17:00	2.1	SW	2.9	SW	3.3	WSW	2.5	SW
17:00 - 18:00	1.7	S	2.4	SW	3.3	WSW	1.8	WSW
18:00 - 19:00	1.9	SW	2.7	SW	2.6	W	2.6	W
19:00 - 20:00	1.8	SSW	4.0	WSW	1.1	NNW	2.0	WSW
20:00 - 21:00	1.8	SW	3.7	WSW	0.9	NNW	2.4	W
21:00 - 22:00	1.9	SSW	3.8	WSW	1.1	N	1.7	W
22:00 - 23:00	2.4	SSW	3.4	WSW	1.0	NE	2.4	W
23:00 - 24:00	2.4	SW	3.6	WSW	2.4	WSW	1.7	WSW
00:00 - 01:00	3.5	WSW	3.4	WSW	3.9	WSW	1.3	W
01:00 - 02:00	2.3	NW	3.3	WSW	3.8	WSW	1.2	W
02:00 - 03:00	2.2	NNW	2.4	WSW	3.6	WSW	2.8	WSW
03:00 - 04:00	1.9	N	2.7	WSW	3.4	WSW	2.5	NW
04:00 - 05:00	1.1	NNE	2.2	SW	2.3	W	2.3	W
05:00 - 06:00	1.1	N	3.2	WSW	2.6	WSW	2.7	W
06:00 - 07:00	1.3	ENE	2.5	SW	2.8	WSW	1.8	WSW
07:00 - 08:00	1.4	N	2.2	SW	3.3	WSW	2.5	W
08:00 - 09:00	1.4	NNW	2.6	SW	3.7	WSW	2.1	W
09:00 - 10:00	2.9	WSW	2.5	SW	3.3	WSW	1.5	WSW
10:00 - 11:00	3.9	WSW	2.7	SW	3.4	WSW	1.8	WSW

Wind Rose



WIND SPEED (m/s) - Scale 1:3

File Control : R:\Database\Windrose\File\Control\Win-224007-North Fence 27 Aug 2024-03 Sep 2024

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose MTR-PTTGC, Branch 2 (Power Plant)

Location : North Fence

Monitor period : 27 Aug 2024-03 Sep 2024

Wind Speed Model : Scarlet WS-21

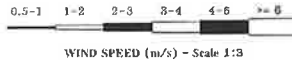
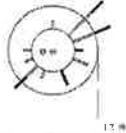
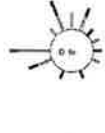
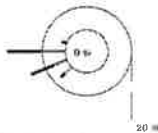
Serial No : AD:66

Wind Direction Model : Scarlet WS-21

Serial No : AD:66

Time	Aug 31-Sep 01 2024		01-02 Sep 2024		02-03 Sep 2024	
	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD
11:00 - 12:00	1.2	W	1.6	WSW	1.3	N
12:00 - 13:00	2.6	WNW	1.1	WSW	1.7	W
13:00 - 14:00	2.5	W	1.7	W	2.8	SW
14:00 - 15:00	1.9	W	1.8	W	2.3	SW
15:00 - 16:00	1.9	W	1.6	W	1.8	WSW
16:00 - 17:00	2.8	W	1.9	W	2.0	SSE
17:00 - 18:00	2.8	W	1.7	NW	1.6	NE
18:00 - 19:00	2.2	WSW	2.7	W	2.5	E
19:00 - 20:00	1.9	WSW	2.6	WSW	1.3	ESE
20:00 - 21:00	1.8	SW	2.1	SSW	1.3	NE
21:00 - 22:00	1.6	SW	2.2	SSE	2.8	ENE
22:00 - 23:00	2.6	SW	1.7	ESE	1.3	ENE
23:00 - 24:00	1.9	WSW	1.4	N	1.7	ENE
00:00 - 01:00	2.0	W	1.4	NNW	1.3	ENE
01:00 - 02:00	2.5	WSW	2.3	NNW	1.8	SSW
02:00 - 03:00	2.8	WSW	1.5	NNE	2.3	SSE
03:00 - 04:00	2.1	WSW	1.4	ENE	2.5	NE
04:00 - 05:00	2.3	W	1.1	NNE	1.6	NE
05:00 - 06:00	1.6	WSW	1.4	N	2.2	ENE
06:00 - 07:00	2.1	W	2.6	E	1.6	NE
07:00 - 08:00	2.8	W	2.2	NE	2.3	NE
08:00 - 09:00	1.2	W	2.4	NNW	1.9	ESE
09:00 - 10:00	1.4	W	1.4	NNW	1.3	SW
10:00 - 11:00	2.4	WSW	2.3	NNE	1.5	SW

Wind Rose



File Control : R:\Data\ss\Winrose\4\ss\ControlWin-224007-North Fence 27 Aug 2024-03 Sep 2024

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose MTR-PTTGC, Branch 2 (Power Plant)

Location : South Fence

Monitor period : 27 Aug 2024-03 Sep 2024

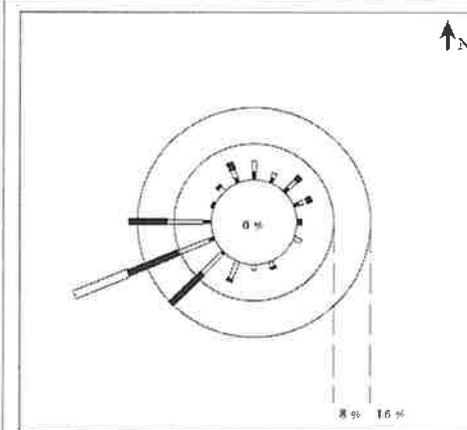
Wind Speed Model : Scarlet WS-21

Serial No : AD:05

Wind Direction Model : Scarlet WS-21

Serial No : AD:05

Direction	Percentage of Occurrence of Wind Direct Grouped in Various Wind Speed						
	0.5-1 m/s	1-2 m/s	2-3 m/s	3-4 m/s	4-6 m/s	More than 6	Total
N	0.0179	0.0238	0.0000	0.0000	0.0000	0.0000	0.0417
NNE	0.0119	0.0119	0.0000	0.0000	0.0000	0.0000	0.0238
NE	0.0119	0.0238	0.0119	0.0000	0.0000	0.0000	0.0476
ENE	0.0119	0.0179	0.0119	0.0000	0.0000	0.0000	0.0417
E	0.0000	0.0000	0.0119	0.0000	0.0000	0.0000	0.0119
ESE	0.0000	0.0179	0.0000	0.0000	0.0000	0.0000	0.0179
SE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SSE	0.0000	0.0119	0.0060	0.0000	0.0000	0.0000	0.0179
S	0.0000	0.0119	0.0000	0.0000	0.0000	0.0000	0.0119
SSW	0.0000	0.0417	0.0060	0.0000	0.0000	0.0000	0.0476
SW	0.0060	0.0595	0.0952	0.0000	0.0000	0.0000	0.1607
WSW	0.0119	0.0714	0.1190	0.1250	0.0000	0.0000	0.3274
W	0.0179	0.0774	0.0833	0.0000	0.0000	0.0000	0.1786
WNW	0.0000	0.0000	0.0060	0.0000	0.0000	0.0000	0.0060
NW	0.0000	0.0119	0.0060	0.0000	0.0000	0.0000	0.0179
NNW	0.0119	0.0179	0.0179	0.0000	0.0000	0.0000	0.0476
CALM	0.0000						



Application : WindPro Ver.1.0

Control : 16 Direction Calculation With
Calm Wind < 0.5 m/sData Unit : Direction in Deg.
Wind Speed in m/sNOTE : Frequencies indicate direction from which
the wind is blowing

File Control : R:\Data\ss\Winrose\4\ss\ControlWin-224007-South Fence 27 Aug 2024-03 Sep 2024

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose MTR-PTTGC, Branch 2 (Power Plant)

Location : South Fence

Monitor period : 27 Aug 2024-03 Sep 2024

Wind Speed Model : Scarlet WS-21

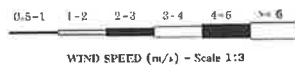
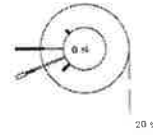
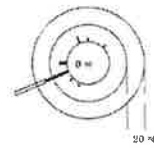
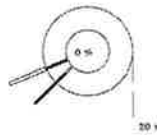
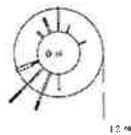
Serial No : AD:05

Wind Direction Model : Scarlet WS-21

Serial No : AD:05

Time	27-28 Aug 2024		28-29 Aug 2024		29-30 Aug 2024		30-31 Aug 2024	
	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD
11:00 - 12:00	1.5	S	2.2	SW	1.4	SSW	3.5	WSW
12:00 - 13:00	1.8	SSW	3.3	WSW	1.6	SW	3.6	WSW
13:00 - 14:00	2.1	SW	2.6	WSW	2.9	WSW	2.0	SW
14:00 - 15:00	1.7	SSW	2.6	WSW	2.7	WSW	2.0	WSW
15:00 - 16:00	1.7	SW	2.4	SW	3.0	WSW	0.8	WSW
16:00 - 17:00	1.7	SW	2.6	SW	3.1	WSW	2.1	SW
17:00 - 18:00	1.4	S	2.1	SW	2.9	WSW	1.4	WSW
18:00 - 19:00	1.5	SW	2.5	SW	2.3	W	2.4	W
19:00 - 20:00	1.6	SSW	3.8	WSW	0.8	NNW	1.6	WSW
20:00 - 21:00	1.6	SW	3.3	WSW	0.5	NNW	2.1	W
21:00 - 22:00	1.7	SSW	3.5	WSW	0.7	N	1.4	W
22:00 - 23:00	2.0	SSW	3.1	WSW	0.8	NE	2.0	W
23:00 - 24:00	2.0	SW	3.4	WSW	2.0	WSW	1.3	WSW
00:00 - 01:00	3.3	WSW	3.0	WSW	3.7	WSW	1.1	W
01:00 - 02:00	1.9	NW	3.0	WSW	3.6	WSW	0.8	W
02:00 - 03:00	2.0	NNW	2.2	WSW	3.3	WSW	2.4	WSW
03:00 - 04:00	1.5	N	2.4	WSW	3.0	WSW	2.2	NW
04:00 - 05:00	0.8	NNE	1.9	SW	2.0	W	2.0	W
05:00 - 06:00	0.7	N	2.8	WSW	2.2	WSW	2.5	W
06:00 - 07:00	0.9	ENE	2.1	SW	2.4	WSW	1.5	WSW
07:00 - 08:00	1.1	N	1.9	SW	2.9	WSW	2.3	W
08:00 - 09:00	1.0	NNW	2.3	SW	3.3	WSW	1.9	W
09:00 - 10:00	2.5	WSW	2.2	SW	3.1	WSW	1.2	WSW
10:00 - 11:00	3.6	WSW	2.4	SW	3.1	WSW	1.4	WSW

Wind Rose



File Content: R:\Database\Windrose\Win-224007-South Fence 27 Aug 2024-03 Sep 2024

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

Preeda S.
(Miss Preeda Sonjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose MTR-PTTGC, Branch 2 (Power Plant)

Location : South Fence

Monitor period : 27 Aug 2024-03 Sep 2024

Wind Speed Model : Scarlet WS-21

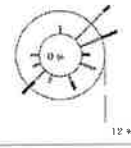
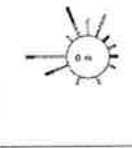
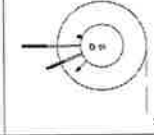
Serial No : AD:05

Wind Direction Model : Scarlet WS-21

Serial No : AD:05

Time	Aug 31-Sep 01 2024		01-02 Sep 2024		02-03 Sep 2024	
	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD
11:00 - 12:00	0.8	W	1.3	WSW	0.9	N
12:00 - 13:00	2.2	WNW	0.8	WSW	1.2	W
13:00 - 14:00	2.2	W	1.4	W	2.5	SW
14:00 - 15:00	1.6	W	1.5	W	2.0	SW
15:00 - 16:00	1.6	W	1.3	W	1.5	WSW
16:00 - 17:00	2.5	W	1.5	W	1.7	SSE
17:00 - 18:00	2.3	W	1.5	NW	1.2	NE
18:00 - 19:00	2.0	WSW	2.3	W	2.1	E
19:00 - 20:00	1.5	WSW	2.1	WSW	1.0	ESE
20:00 - 21:00	1.4	SW	1.7	SSW	0.9	NE
21:00 - 22:00	1.2	SW	1.9	SSE	2.5	ENE
22:00 - 23:00	2.4	SW	1.3	ESE	0.9	ENE
23:00 - 24:00	1.5	WSW	1.0	N	1.3	ENE
00:00 - 01:00	1.8	W	1.1	NNW	1.1	ENE
01:00 - 02:00	2.2	WSW	2.0	NNW	1.4	SSW
02:00 - 03:00	2.5	WSW	1.2	NNE	2.1	SSE
03:00 - 04:00	1.7	WSW	1.1	ENE	2.2	NE
04:00 - 05:00	2.0	W	0.9	NNE	1.3	NE
05:00 - 06:00	1.4	WSW	1.1	N	2.0	ENE
06:00 - 07:00	1.7	W	2.3	E	1.2	NE
07:00 - 08:00	2.6	W	2.0	NE	1.8	NE
08:00 - 09:00	0.9	W	2.1	NNW	1.6	ESE
09:00 - 10:00	1.0	W	1.1	NNW	0.9	SW
10:00 - 11:00	2.2	WSW	1.9	NNE	1.3	SW

Wind Rose



File Content: R:\Database\Windrose\Win-224007-South Fence 27 Aug 2024-03 Sep 2024

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

Preeda S.
(Miss Preeda Sonjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose MTR-PTTGC, Branch 2 (Power Plant)

Location : Ban Map Chalute

Monitor period : 27 Aug 2024-03 Sep 2024

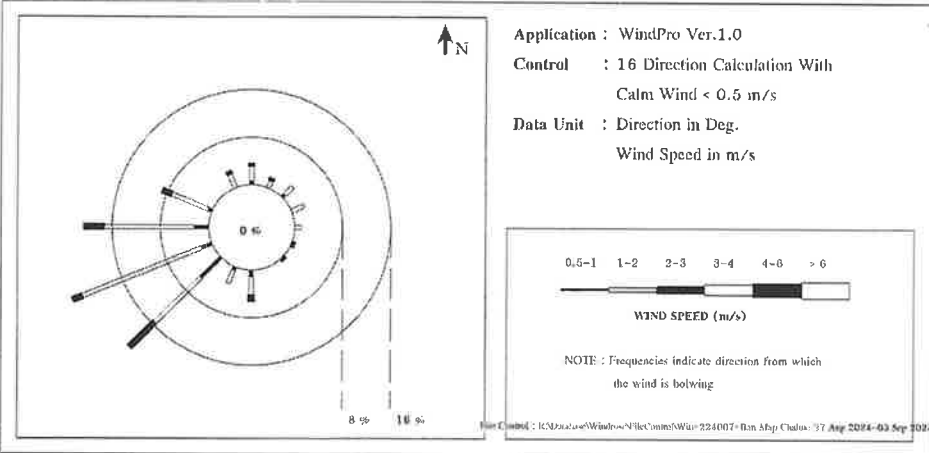
Wind Speed Model : Novalynx NL-32

Serial No : 1205

Wind Direction Model : Novalynx NL-32

Serial No : 1205

Direction	Percentage of Occurrence of Wind Direct Grouped in Various Wind Speed						Total
	0.5 - 1 m/s	1 - 2 m/s	2 - 3 m/s	3 - 4 m/s	4 - 6 m/s	More than 6	
N	0.0060	0.0238	0.0060	0.0000	0.0000	0.0000	0.0357
NNE	0.0000	0.0119	0.0060	0.0000	0.0000	0.0000	0.0179
NE	0.0060	0.0179	0.0000	0.0000	0.0000	0.0000	0.0238
ENE	0.0000	0.0238	0.0000	0.0000	0.0000	0.0000	0.0238
E	0.0000	0.0119	0.0000	0.0000	0.0000	0.0000	0.0119
ESE	0.0000	0.0000	0.0060	0.0000	0.0000	0.0000	0.0060
SE	0.0000	0.0000	0.0060	0.0000	0.0000	0.0000	0.0060
SSE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
S	0.0119	0.0298	0.0119	0.0000	0.0000	0.0000	0.0536
SSW	0.0060	0.0238	0.0000	0.0000	0.0000	0.0000	0.0298
SW	0.0476	0.1071	0.0595	0.0000	0.0000	0.0000	0.2143
WSW	0.0179	0.2143	0.0179	0.0000	0.0000	0.0000	0.2500
W	0.0238	0.1488	0.0357	0.0000	0.0000	0.0000	0.2083
WNW	0.0060	0.0655	0.0179	0.0000	0.0000	0.0000	0.0893
NW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NNW	0.0000	0.0238	0.0060	0.0000	0.0000	0.0000	0.0298
CALM	0.0000						



(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose MTR-PTTGC, Branch 2 (Power Plant)

Location : Ban Map Chalute

Monitor period : 27 Aug 2024-03 Sep 2024

Wind Speed Model : Novalynx NL-32

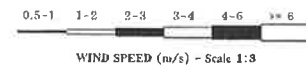
Serial No : 1205

Wind Direction Model : Novalynx NL-32

Serial No : 1205

Time	27-28 Aug 2024		28-29 Aug 2024		29-30 Aug 2024		30-31 Aug 2024	
	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD
13:00 - 14:00	1.4	SSW	1.5	SSW	0.7	WSW	1.9	W
14:00 - 15:00	0.8	S	1.4	SW	0.9	WSW	0.8	W
15:00 - 16:00	1.1	S	1.7	SSW	2.0	WSW	0.9	SW
16:00 - 17:00	1.7	S	2.0	SW	1.3	WSW	2.1	W
17:00 - 18:00	1.8	S	0.8	SW	1.8	W	1.6	WNW
18:00 - 19:00	2.2	S	1.3	SW	1.5	NNW	1.9	W
19:00 - 20:00	2.2	S	0.9	SW	1.0	ENE	1.1	W
20:00 - 21:00	0.7	S	2.3	SW	1.2	ENE	2.0	W
21:00 - 22:00	1.3	S	1.2	SW	0.8	NE	1.3	W
22:00 - 23:00	1.6	SSW	2.2	WSW	2.0	SW	1.6	W
23:00 - 24:00	2.0	SW	1.3	SW	1.6	SW	1.4	W
00:00 - 01:00	0.7	W	1.8	WSW	1.9	SW	1.3	W
01:00 - 02:00	1.1	N	0.8	SW	1.7	WSW	1.1	W
02:00 - 03:00	2.1	N	0.7	SW	1.5	WSW	1.1	NNW
03:00 - 04:00	1.8	NE	2.0	SW	1.2	SW	2.2	WNW
04:00 - 05:00	1.0	ENE	1.4	SW	1.7	SW	1.1	WNW
05:00 - 06:00	1.9	E	0.9	SW	0.8	SW	0.9	W
06:00 - 07:00	1.5	NE	1.6	SW	1.8	WSW	2.2	W
07:00 - 08:00	1.5	NNE	1.8	SW	1.0	WSW	1.8	WNW
08:00 - 09:00	1.0	WNW	1.0	SW	1.9	WSW	1.7	W
09:00 - 10:00	1.9	SW	1.8	WSW	2.1	SW	2.3	W
10:00 - 11:00	0.8	SSW	0.9	SW	2.1	SW	2.1	W
11:00 - 12:00	2.1	SW	2.0	SW	1.8	WSW	2.1	WNW
12:00 - 13:00	1.7	SW	1.9	WSW	1.9	SW	1.5	W

Wind Rose



(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose MTR-PTTGC, Branch 2 (Power Plant)

Location : Ban Map Chalute

Monitor period : 27 Aug 2024-03 Sep 2024

Wind Speed Model : Novalynx NL-32

Serial No : 1205

Wind Direction Model : Novalynx NL-32

Serial No : 1205

Time	Aug 31-Sep 01 2024		01-02 Sep 2024		02-03 Sep 2024	
	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD
13:00 - 14:00	1.9	W	1.7	WNW	1.7	SW
14:00 - 15:00	1.2	WNW	2.3	WNW	0.9	WSW
15:00 - 16:00	2.2	W	0.9	WNW	1.4	WSW
16:00 - 17:00	0.9	W	1.2	NNW	1.3	WSW
17:00 - 18:00	1.4	W	1.9	W	1.3	WSW
18:00 - 19:00	1.4	W	1.2	WSW	1.3	WSW
19:00 - 20:00	1.0	WSW	1.8	SW	1.3	WSW
20:00 - 21:00	2.2	SW	1.0	S	1.3	WSW
21:00 - 22:00	1.4	WSW	2.2	SE	1.3	WSW
22:00 - 23:00	1.3	W	1.9	N	1.3	WSW
23:00 - 24:00	1.7	W	1.4	N	1.3	WSW
00:00 - 01:00	1.2	W	1.2	N	1.3	WSW
01:00 - 02:00	1.5	W	1.9	NNE	1.3	WSW
02:00 - 03:00	1.7	W	1.7	E	1.3	WSW
03:00 - 04:00	1.8	W	1.4	NE	1.3	WSW
04:00 - 05:00	1.0	W	2.0	N	1.3	WSW
05:00 - 06:00	1.1	WNW	2.1	ESE	1.3	WSW
06:00 - 07:00	1.6	WNW	1.1	ENE	1.3	WSW
07:00 - 08:00	1.8	WNW	1.5	NNW	1.3	WSW
08:00 - 09:00	1.7	W	2.2	NNW	1.3	WSW
09:00 - 10:00	2.0	WSW	0.7	N	1.3	WSW
10:00 - 11:00	1.9	WSW	1.8	WNW	1.3	WSW
11:00 - 12:00	1.1	W	1.6	W	1.3	WSW
12:00 - 13:00	1.7	WNW	1.1	SW	1.3	WSW

Wind Rose



(Miss Katesarin Vorradetwittaya)
Environmental Scientist

Preeda S.
(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose MTR-PTTGC, Branch 2 (Power Plant)

Location : Ban Nong Feab

Monitor period : 27 Aug 2024-03 Sep 2024

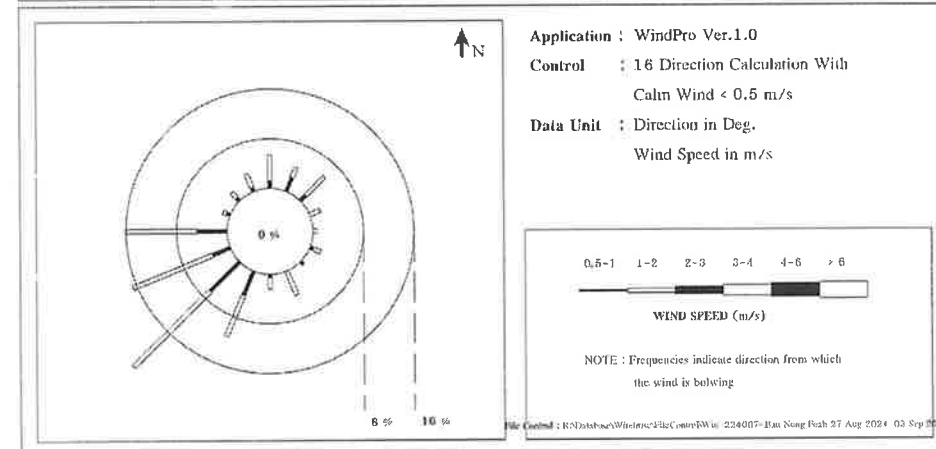
Wind Speed Model : Novalynx WS-25

Serial No : A5092

Wind Direction Model : Novalynx WS-25

Serial No : A5092

Direction	Percentage of Occurrence of Wind Direct Grouped in Various Wind Speed						Total
	0.5-1 m/s	1-2 m/s	2-3 m/s	3-4 m/s	4-6 m/s	More than 6	
N	0.0119	0.0417	0.0000	0.0000	0.0000	0.0000	0.0536
NNE	0.0238	0.0179	0.0000	0.0000	0.0000	0.0000	0.0417
NE	0.0119	0.0417	0.0000	0.0000	0.0000	0.0000	0.0536
ENE	0.0000	0.0179	0.0000	0.0000	0.0000	0.0000	0.0179
E	0.0000	0.0060	0.0000	0.0000	0.0000	0.0000	0.0060
ESE	0.0060	0.0119	0.0000	0.0000	0.0000	0.0000	0.0179
SE	0.0060	0.0000	0.0000	0.0000	0.0000	0.0000	0.0060
SSE	0.0000	0.0417	0.0000	0.0000	0.0000	0.0000	0.0417
S	0.0060	0.0179	0.0000	0.0000	0.0000	0.0000	0.0238
SSW	0.0417	0.0714	0.0000	0.0000	0.0000	0.0000	0.1131
SW	0.0655	0.1726	0.0000	0.0000	0.0000	0.0000	0.2381
WSW	0.0298	0.1369	0.0000	0.0000	0.0000	0.0000	0.1667
W	0.0476	0.1131	0.0000	0.0000	0.0000	0.0000	0.1607
WNW	0.0060	0.0060	0.0000	0.0000	0.0000	0.0000	0.0119
NW	0.0060	0.0119	0.0000	0.0000	0.0000	0.0000	0.0179
NNW	0.0060	0.0238	0.0000	0.0000	0.0000	0.0000	0.0298
CALM	0.0000						



(Miss Katesarin Vorradetwittaya)
Environmental Scientist

Preeda S.
(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose MTR-PTTGC, Branch 2 (Power Plant)

Location : Ban Nong Feab

Monitor period : 27 Aug 2024-03 Sep 2024

Wind Speed Model : Novalynx WS-25

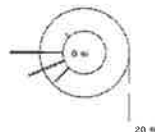
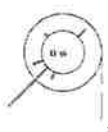
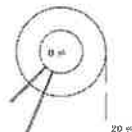
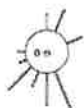
Serial No : A5092

Wind Direction Model : Novalynx WS-25

Serial No : A5092

Time	27-28 Aug 2024		28-29 Aug 2024		29-30 Aug 2024		30-31 Aug 2024	
	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD
11:00 - 12:00	1.8	SW	1.3	SSW	1.5	SSW	0.9	SW
12:00 - 13:00	0.8	SW	1.8	SSW	1.8	SW	0.8	SW
13:00 - 14:00	1.6	SSW	1.8	SW	1.1	SW	1.2	SW
14:00 - 15:00	0.7	SSW	1.8	SSW	1.0	SW	1.0	WSW
15:00 - 16:00	1.8	S	0.7	SSW	1.0	WSW	1.5	WSW
16:00 - 17:00	1.0	S	0.8	SSW	1.0	SW	0.9	SW
17:00 - 18:00	1.6	SSE	0.8	SSW	1.7	WSW	1.6	W
18:00 - 19:00	1.1	SSE	0.9	SSW	1.2	WSW	1.7	W
19:00 - 20:00	1.2	SSE	1.7	SW	1.5	NW	1.5	WSW
20:00 - 21:00	1.0	SSE	0.8	SW	0.9	NE	0.8	W
21:00 - 22:00	1.5	SSE	0.9	SW	1.7	NE	1.6	W
22:00 - 23:00	0.8	S	1.4	SW	1.0	NE	1.8	W
23:00 - 24:00	1.2	S	1.4	SW	0.7	SW	1.2	WSW
00:00 - 01:00	1.6	SW	1.1	SW	1.8	SW	1.0	W
01:00 - 02:00	1.5	WSW	1.2	SW	1.6	SW	0.8	W
02:00 - 03:00	1.8	N	0.8	SSW	0.9	SW	1.4	WSW
03:00 - 04:00	1.3	N	1.7	SW	1.6	SW	1.8	NW
04:00 - 05:00	0.7	NNE	1.5	SSW	0.7	SW	0.7	W
05:00 - 06:00	1.1	ENE	1.6	SSW	1.5	SW	1.6	W
06:00 - 07:00	1.4	ENE	1.4	SSW	0.7	SW	1.6	WSW
07:00 - 08:00	1.7	NNE	1.6	SSW	1.8	SW	1.2	W
08:00 - 09:00	0.8	NNE	1.7	SSW	1.3	SW	0.8	W
09:00 - 10:00	1.6	W	1.4	SSW	1.0	SW	0.7	WSW
10:00 - 11:00	1.7	SW	1.7	SW	1.6	SSW	1.7	WSW

Wind Rose



WIND SPEED (m/s) - Scale 1:3

File Content: R:\Database\Windrose\Final\Win-224007-Ban Nong Feab 27 Aug 2024-03 Sep 2024

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose MTR-PTTGC, Branch 2 (Power Plant)

Location : Ban Nong Feab

Monitor period : 27 Aug 2024-03 Sep 2024

Wind Speed Model : Novalynx WS-25

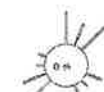
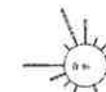
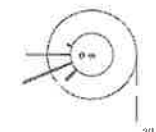
Serial No : A5092

Wind Direction Model : Novalynx WS-25

Serial No : A5092

Time	Aug 31-Sep 01 2024		01-02 Sep 2024		02-03 Sep 2024	
	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD
11:00 - 12:00	1.5	W	1.2	WSW	1.4	WNW
12:00 - 13:00	0.9	WNW	1.7	WSW	1.4	WSW
13:00 - 14:00	1.5	W	0.7	W	1.1	SW
14:00 - 15:00	1.5	W	0.6	W	1.6	SW
15:00 - 16:00	1.7	W	1.5	W	1.1	SW
16:00 - 17:00	1.5	W	1.1	W	1.2	W
17:00 - 18:00	0.8	WSW	0.8	NW	1.1	NNE
18:00 - 19:00	1.5	WSW	1.1	W	1.1	NE
19:00 - 20:00	1.1	WSW	1.8	SW	1.1	NE
20:00 - 21:00	0.8	SW	0.9	SSW	1.2	NE
21:00 - 22:00	1.6	SW	1.0	SSE	1.4	N
22:00 - 23:00	1.5	SW	0.8	ESE	1.0	NNE
23:00 - 24:00	1.1	WSW	0.9	N	1.2	NE
00:00 - 01:00	1.4	W	0.8	NNW	0.9	NNE
01:00 - 02:00	1.4	WSW	1.3	NNW	0.8	SE
02:00 - 03:00	1.3	WSW	1.7	N	1.0	SSE
03:00 - 04:00	1.1	WSW	1.8	ENE	1.4	N
04:00 - 05:00	0.9	WSW	0.7	NNE	1.5	N
05:00 - 06:00	1.3	WSW	0.8	N	1.6	ESE
06:00 - 07:00	0.7	W	1.3	E	1.4	N
07:00 - 08:00	1.3	W	0.9	NE	1.5	NE
08:00 - 09:00	0.8	W	1.7	NNW	1.3	ESE
09:00 - 10:00	1.4	WSW	1.1	NNW	0.9	WSW
10:00 - 11:00	0.7	WSW	1.0	NNW	1.0	WSW

Wind Rose



WIND SPEED (m/s) - Scale 1:3

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(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



บริษัท ซีคอต จำกัด
SECOT CO., LTD.

239 ถนนวิมลทองประไพ 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 : PTT Global Chemical Public Co., Ltd. REFERENCE NO. : 224007 Amb (Cert.)/TSP/Aug-Sep 2024
Branch 2, Power Plant SAMPLING DATE : 27/08/2024-03/09/2024
SAMPLING BY : SECOT Co., Ltd. ANALYTICAL DATE : 11-12/09/2024
RECEIVED DATE : 11/09/2024 SAMPLE CONDITION : Normal
REPORT DATE : 18/09/2024 SITE OPERATOR : Mr. Phuwadech Kaewjirakulsri
LOCATION DESCRIPTION : 1. Ban Map Chalute
2. Ban Nong Feab

PARAMETER	SAMPLING DATE	UNITS	RESULTS		STANDARD*	REFERENCE METHODS
			1	2		
TSP (24 hr)	27-28/08/2024	mg/m ³	0.039	0.022	0.330	High Volume Air
	28-29/08/2024	mg/m ³	0.031	0.020		Sampler/Gravimetric
	29-30/08/2024	mg/m ³	0.026	0.017		Method
	30-31/08/2024	mg/m ³	0.039	0.037		
	31/08/2024-01/09/2024	mg/m ³	0.025	0.035		
	01-02/09/2024	mg/m ³	0.021	0.038		
	02-03/09/2024	mg/m ³	0.013	0.018		

(Miss Pornnapa Budthum)
Analyst

(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 National Environment Board, No.24, B.E.2547 (2004).



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AMBIENT AIR QUALITY ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Co., Ltd. REFERENCE NO. : 224007 Amb (Cert.)/PM-10/Aug-Sep 2024
Branch 2, Power Plant SAMPLING DATE : 27/08/2024-03/09/2024
SAMPLING BY : SECOT Co., Ltd. ANALYTICAL DATE : 11-12/09/2024
RECEIVED DATE : 11/09/2024 SAMPLE CONDITION : Normal
REPORT DATE : 18/09/2024 SITE OPERATOR : Mr. Phuwadech Kaewjirakulsri
LOCATION DESCRIPTION : 1. Ban Map Chalute
2. Ban Nong Feab

PARAMETER	SAMPLING DATE	UNITS	RESULTS		STANDARD*	REFERENCE METHODS
			1	2		
PM-10 (24 hr)	27-28/08/2024	mg/m ³	0.026	0.008	0.120	High Volume Air Sampler
	28-29/08/2024	mg/m ³	0.023	0.013		(Hi-Vol PM-10 Size
	29-30/08/2024	mg/m ³	0.024	0.007		Selective Inlet)/
	30-31/08/2024	mg/m ³	0.028	0.010		Gravimetric Method
	31/08/2024-01/09/2024	mg/m ³	0.018	0.009		
	01-02/09/2024	mg/m ³	0.017	0.008		
	02-03/09/2024	mg/m ³	0.010	0.007		

(Miss Pornnapa Budthum)
Analyst

(Miss Narisa Poowasanpetch)
Technical Management Team

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Ambient Air Monitoring Results : Sulfur dioxide MTR-PTTGC, Branch 2 (Power Plant)

Location : Ban Map Chahue Monitor Period : 27 Aug 2024-03 Sep 2024
Analyzer Model : API 100A Station No : SS2-09
Serial No : 906 Site Operator : Mr. Phuwadech Kaewjirakulsi

Calibrator Model : Teledyne 700E Serial No : 587
Calibration Gas Cylinder I.D. : EB0102326
Certified Date : 08 Jan 2024 Cal Concentration (ppb) : 0,100,200,400
Expire Date : 07 Jan 2025

Time	SO2 Concentration (ppm)						
	27-28 Aug 2024	28-29 Aug 2024	29-30 Aug 2024	30-31 Aug 2024	31-01 Sep 2024	01-02 Sep 2024	02-03 Sep 2024
13:00 - 14:00	0.0053	0.0056	0.0064	0.0061	0.0060	0.0040	0.0061
14:00 - 15:00	0.0045	0.0045	0.0067	0.0051	0.0041	0.0048	0.0043
15:00 - 16:00	0.0042	0.0066	0.0066	0.0059	0.0068	0.0062	0.0071
16:00 - 17:00	0.0038	0.0056	0.0055	0.0072	0.0070	0.0061	0.0046
17:00 - 18:00	0.0061	0.0062	0.0087	0.0046	0.0054	0.0058	0.0067
18:00 - 19:00	0.0069	0.0042	0.0043	0.0044	0.0046	0.0057	0.0068
19:00 - 20:00	0.0053	0.0067	0.0053	0.0062	0.0070	0.0059	0.0053
20:00 - 21:00	0.0068	0.0065	0.0040	0.0071	0.0044	0.0040	0.0061
21:00 - 22:00	0.0044	0.0059	0.0065	0.0058	0.0058	0.0070	0.0043
22:00 - 23:00	0.0058	0.0063	0.0068	0.0055	0.0045	0.0051	0.0052
23:00 - 00:00	0.0045	0.0049	0.0063	0.0040	0.0061	0.0071	0.0063
00:00 - 01:00	0.0042	0.0070	0.0056	0.0072	0.0054	0.0048	0.0051
01:00 - 02:00	0.0041	0.0061	0.0053	0.0054	0.0063	0.0046	0.0059
02:00 - 03:00	0.0068	0.0042	0.0045	0.0062	0.0048	0.0062	0.0064
03:00 - 04:00	0.0055	0.0047	0.0044	0.0048	0.0050	0.0071	0.0043
04:00 - 05:00	0.0045	0.0057	0.0046	0.0054	0.0063	0.0054	0.0061
05:00 - 06:00	0.0067	0.0040	0.0048	0.0069	0.0072	0.0062	0.0040
06:00 - 07:00	0.0055	0.0043	0.0047	0.0057	0.0072	0.0043	0.0059
07:00 - 08:00	0.0040	0.0045	0.0058	0.0069	0.0056	0.0064	0.0055
08:00 - 09:00	0.0046	0.0052	0.0072	0.0060	0.0067	0.0067	0.0071
09:00 - 10:00	0.0071	0.0068	0.0063	0.0063	0.0060	0.0057	0.0066
10:00 - 11:00	0.0044	0.0061	0.0054	0.0059	0.0071	0.0046	0.0060
11:00 - 12:00	0.0040	0.0051	0.0061	0.0056	0.0045	0.0039	0.0055
12:00 - 13:00	0.0062	0.0072	0.0059	0.0060	0.0060	0.0054	0.0045
Average-24Hr*	0.0052	0.0056	0.0057	0.0056	0.0058	0.0055	0.0056
Max-1Hr	0.0071	0.0072	0.0072	0.0072	0.0072	0.0071	0.0071
Min-1Hr	0.0038	0.0040	0.0040	0.0039	0.0041	0.0039	0.0040
Standard-1Hr	0.30 ppm(780 ug/cu.m)						
Standard-24Hr	0.12 ppm(300 ug/cu.m)						

Remark : * Average time between 18:00-18:00

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



Ambient Air Monitoring Results : Sulfur dioxide MTR-PTTGC, Branch 2 (Power Plant)

Location : Ban Nong Feab Monitor Period : 27 Aug 2024-03 Sep 2024
Analyzer Model : Thermo 43C Station No : SS2-01
Serial No : 0607415773 Site Operator : Mr. Phuwadech Kaewjirakulsi

Calibrator Model : Teledyne 700E Serial No : 587
Calibration Gas Cylinder I.D. : EB0102326
Certified Date : 04 Jan 2024 Cal Concentration (ppb) : 0,100,200,400
Expire Date : 03 Jan 2025

Time	SO2 Concentration (ppm)						
	27-28 Aug 2024	28-29 Aug 2024	29-30 Aug 2024	30-31 Aug 2024	31-01 Sep 2024	01-02 Sep 2024	02-03 Sep 2024
11:00 - 12:00	0.0048	0.0024	0.0028	0.0055	0.0044	0.0057	0.0030
12:00 - 13:00	0.0034	0.0021	0.0057	0.0034	0.0057	0.0029	0.0026
13:00 - 14:00	0.0031	0.0019	0.0042	0.0056	0.0035	0.0034	0.0052
14:00 - 15:00	0.0046	0.0024	0.0029	0.0028	0.0032	0.0036	0.0045
15:00 - 16:00	0.0040	0.0039	0.0020	0.0019	0.0023	0.0039	0.0039
16:00 - 17:00	0.0037	0.0041	0.0019	0.0025	0.0024	0.0029	0.0025
17:00 - 18:00	0.0051	0.0019	0.0032	0.0043	0.0054	0.0030	0.0034
18:00 - 19:00	0.0041	0.0030	0.0037	0.0032	0.0039	0.0035	0.0021
19:00 - 20:00	0.0033	0.0039	0.0041	0.0044	0.0046	0.0021	0.0031
20:00 - 21:00	0.0038	0.0039	0.0046	0.0038	0.0050	0.0028	0.0025
21:00 - 22:00	0.0034	0.0057	0.0038	0.0038	0.0020	0.0036	0.0039
22:00 - 23:00	0.0025	0.0036	0.0027	0.0034	0.0024	0.0050	0.0044
23:00 - 00:00	0.0053	0.0051	0.0043	0.0057	0.0051	0.0036	0.0030
00:00 - 01:00	0.0032	0.0048	0.0039	0.0031	0.0050	0.0027	0.0044
01:00 - 02:00	0.0046	0.0038	0.0050	0.0022	0.0035	0.0027	0.0020
02:00 - 03:00	0.0034	0.0036	0.0043	0.0020	0.0053	0.0033	0.0021
03:00 - 04:00	0.0045	0.0037	0.0024	0.0039	0.0058	0.0032	0.0051
04:00 - 05:00	0.0036	0.0029	0.0019	0.0025	0.0019	0.0038	0.0034
05:00 - 06:00	0.0021	0.0031	0.0027	0.0042	0.0056	0.0031	0.0039
06:00 - 07:00	0.0049	0.0050	0.0044	0.0054	0.0028	0.0023	0.0042
07:00 - 08:00	0.0028	0.0044	0.0046	0.0026	0.0043	0.0058	0.0051
08:00 - 09:00	0.0021	0.0055	0.0023	0.0041	0.0025	0.0023	0.0051
09:00 - 10:00	0.0019	0.0038	0.0032	0.0039	0.0020	0.0031	0.0027
10:00 - 11:00	0.0038	0.0037	0.0046	0.0054	0.0031	0.0037	0.0041
Average-24Hr*	0.0037	0.0037	0.0035	0.0037	0.0038	0.0034	0.0036
Max-1Hr	0.0053	0.0057	0.0057	0.0057	0.0058	0.0058	0.0052
Min-1Hr	0.0019	0.0019	0.0019	0.0019	0.0019	0.0021	0.0020
Standard-1Hr	0.30 ppm(780 ug/cu.m)						
Standard-24Hr	0.12 ppm(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-PTTGC, Branch 2 (Power Plant)

Location : North Fence Monitor Period : 27 Aug 2024-03 Sep 2024
Analyzer Model : API 200A Station No : Mobile 18
Serial No : 1528 Site Operator : Mr. Phuwadech Kaewjirakulsri

Calibrator Model : Teledyne 700E Serial No : 587
Calibration Gas Cylinder I.D. : EB0102326
Certified Date : 05 Jan 2024 Cal Concentration (ppb) : 0,100,200,400
Expire Date : 04 Jan 2025

Time	NO2 Concentration (ppm)						
	27-28 Aug 2024	28-29 Aug 2024	29-30 Aug 2024	30-31 Aug 2024	31-01 Sep 2024	01-02 Sep 2024	02-03 Sep 2024
11:00 - 12:00	0.0055	0.0042	0.0065	0.0061	0.0050	0.0054	0.0067
12:00 - 13:00	0.0042	0.0057	0.0061	0.0047	0.0059	0.0042	0.0056
13:00 - 14:00	0.0056	0.0047	0.0058	0.0048	0.0047	0.0049	0.0058
14:00 - 15:00	0.0058	0.0057	0.0044	0.0045	0.0040	0.0058	0.0063
15:00 - 16:00	0.0044	0.0065	0.0063	0.0040	0.0037	0.0055	0.0056
16:00 - 17:00	0.0048	0.0065	0.0045	0.0042	0.0050	0.0062	0.0058
17:00 - 18:00	0.0050	0.0054	0.0062	0.0057	0.0050	0.0065	0.0045
18:00 - 19:00	0.0048	0.0037	0.0067	0.0040	0.0064	0.0063	0.0062
19:00 - 20:00	0.0059	0.0056	0.0052	0.0044	0.0046	0.0037	0.0045
20:00 - 21:00	0.0040	0.0039	0.0046	0.0066	0.0064	0.0037	0.0039
21:00 - 22:00	0.0047	0.0061	0.0059	0.0048	0.0055	0.0043	0.0066
22:00 - 23:00	0.0050	0.0058	0.0057	0.0058	0.0055	0.0065	0.0048
23:00 - 00:00	0.0060	0.0082	0.0054	0.0053	0.0053	0.0059	0.0046
00:00 - 01:00	0.0036	0.0043	0.0059	0.0059	0.0060	0.0038	0.0067
01:00 - 02:00	0.0059	0.0063	0.0043	0.0038	0.0053	0.0039	0.0046
02:00 - 03:00	0.0045	0.0065	0.0052	0.0052	0.0053	0.0055	0.0065
03:00 - 04:00	0.0063	0.0058	0.0048	0.0043	0.0047	0.0040	0.0065
04:00 - 05:00	0.0047	0.0064	0.0055	0.0039	0.0048	0.0061	0.0047
05:00 - 06:00	0.0048	0.0066	0.0039	0.0044	0.0039	0.0059	0.0058
06:00 - 07:00	0.0051	0.0060	0.0059	0.0054	0.0062	0.0054	0.0041
07:00 - 08:00	0.0044	0.0038	0.0045	0.0052	0.0061	0.0035	0.0055
08:00 - 09:00	0.0054	0.0041	0.0061	0.0050	0.0035	0.0061	0.0063
09:00 - 10:00	0.0043	0.0038	0.0068	0.0066	0.0037	0.0064	0.0054
10:00 - 11:00	0.0055	0.0053	0.0068	0.0065	0.0058	0.0052	0.0037
Average-24Hr*	0.0050	0.0053	0.0056	0.0050	0.0051	0.0052	0.0054
Max-1Hr	0.0080	0.0068	0.0068	0.0086	0.0064	0.0065	0.0068
Min-1Hr	0.0038	0.0037	0.0043	0.0038	0.0035	0.0035	0.0037
Standard-1Hr	0.17 ppm(320 ug/cu.m)						
Standard-24Hr	-						

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

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Sonjai)
Technical Management Team



Ambient Air Monitoring Results : Nitrogen dioxide MTR-PTTGC, Branch 2 (Power Plant)

Location : South Fence Monitor Period : 27 Aug 2024-03 Sep 2024
Analyzer Model : API 200A Station No : SCT-14
Serial No : 1642 Site Operator : Mr. Phuwadech Kaewjirakulsri

Calibrator Model : Teledyne 700E Serial No : 587
Calibration Gas Cylinder I.D. : EB0102326
Certified Date : 05 Jan 2024 Cal Concentration (ppb) : 0,100,200,400
Expire Date : 04 Jan 2025

Time	NO2 Concentration (ppm)						
	27-28 Aug 2024	28-29 Aug 2024	29-30 Aug 2024	30-31 Aug 2024	31-01 Sep 2024	01-02 Sep 2024	02-03 Sep 2024
10:00 - 11:00	0.0063	0.0092	0.0096	0.0083	0.0083	0.0060	0.0084
11:00 - 12:00	0.0061	0.0093	0.0087	0.0084	0.0059	0.0075	0.0082
12:00 - 13:00	0.0093	0.0069	0.0069	0.0068	0.0071	0.0096	0.0075
13:00 - 14:00	0.0063	0.0078	0.0091	0.0074	0.0084	0.0059	0.0085
14:00 - 15:00	0.0064	0.0063	0.0081	0.0094	0.0090	0.0066	0.0078
15:00 - 16:00	0.0085	0.0083	0.0071	0.0091	0.0085	0.0068	0.0078
16:00 - 17:00	0.0085	0.0061	0.0084	0.0091	0.0067	0.0078	0.0093
17:00 - 18:00	0.0086	0.0090	0.0094	0.0081	0.0069	0.0088	0.0064
18:00 - 19:00	0.0073	0.0065	0.0079	0.0086	0.0089	0.0070	0.0094
19:00 - 20:00	0.0096	0.0078	0.0077	0.0078	0.0092	0.0076	0.0084
20:00 - 21:00	0.0094	0.0090	0.0073	0.0081	0.0071	0.0091	0.0082
21:00 - 22:00	0.0093	0.0085	0.0093	0.0081	0.0085	0.0089	0.0081
22:00 - 23:00	0.0094	0.0084	0.0095	0.0081	0.0061	0.0094	0.0087
23:00 - 00:00	0.0064	0.0084	0.0078	0.0086	0.0059	0.0077	0.0093
00:00 - 01:00	0.0073	0.0087	0.0092	0.0092	0.0084	0.0085	0.0079
01:00 - 02:00	0.0098	0.0068	0.0069	0.0094	0.0095	0.0089	0.0067
02:00 - 03:00	0.0079	0.0091	0.0070	0.0087	0.0091	0.0076	0.0094
03:00 - 04:00	0.0076	0.0091	0.0092	0.0069	0.0071	0.0085	0.0089
04:00 - 05:00	0.0088	0.0086	0.0076	0.0076	0.0081	0.0089	0.0090
05:00 - 06:00	0.0087	0.0072	0.0065	0.0060	0.0078	0.0083	0.0076
06:00 - 07:00	0.0062	0.0092	0.0078	0.0084	0.0080	0.0072	0.0076
07:00 - 08:00	0.0080	0.0080	0.0073	0.0086	0.0091	0.0064	0.0060
08:00 - 09:00	0.0086	0.0083	0.0095	0.0072	0.0076	0.0073	0.0067
09:00 - 10:00	0.0069	0.0092	0.0089	0.0092	0.0079	0.0060	0.0093
Average-24Hr*	0.0078	0.0061	0.0082	0.0078	0.0079	0.0078	0.0060
Max-1Hr	0.0096	0.0093	0.0098	0.0094	0.0095	0.0096	0.0094
Min-1Hr	0.0060	0.0061	0.0065	0.0060	0.0059	0.0060	0.0060
Standard-1Hr	0.17 ppm(320 ug/cu.m)						
Standard-24Hr	-						

Remark : * Average time between 10:00-10:00

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Sonjai)
Technical Management Team

**Ambient Air Monitoring Results : Nitrogen dioxide
MTR-PTTGC, Branch 2 (Power Plant)**

Location : Ban Map Chalute

Monitor Period : 27 Aug 2024-03 Sep 2024

Analyzer Model : Thermo 42C

Station No : SS2-09

Serial No : 0426708263

Site Operator : Mr. Phuwadech Kaewjirakulsri

Calibrator Model : Teledyne 700E

Serial No : 587

Calibration Gas Cylinder I.D. : EB0102326

Certified Date : 05 Jan 2024

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

Expire Date : 04 Jan 2025

Time	NO2 Concentration (ppm)						
	27-28 Aug 2024	28-29 Aug 2024	29-30 Aug 2024	30-31 Aug 2024	31-01 Sep 2024	01-02 Sep 2024	02-03 Sep 2024
13:00 - 14:00	0.0088	0.0082	0.0069	0.0046	0.0043	0.0056	0.0055
14:00 - 15:00	0.0067	0.0053	0.0059	0.0054	0.0041	0.0062	0.0052
15:00 - 16:00	0.0057	0.0049	0.0062	0.0061	0.0068	0.0050	0.0061
16:00 - 17:00	0.0068	0.0052	0.0052	0.0066	0.0048	0.0049	0.0042
17:00 - 18:00	0.0065	0.0047	0.0087	0.0065	0.0065	0.0047	0.0058
18:00 - 19:00	0.0042	0.0064	0.0067	0.0053	0.0065	0.0057	0.0056
19:00 - 20:00	0.0059	0.0066	0.0054	0.0043	0.0062	0.0056	0.0057
20:00 - 21:00	0.0064	0.0043	0.0056	0.0057	0.0045	0.0069	0.0063
21:00 - 22:00	0.0047	0.0067	0.0046	0.0087	0.0055	0.0059	0.0057
22:00 - 23:00	0.0061	0.0054	0.0043	0.0051	0.0060	0.0066	0.0046
23:00 - 00:00	0.0066	0.0055	0.0048	0.0050	0.0050	0.0060	0.0068
00:00 - 01:00	0.0065	0.0058	0.0057	0.0042	0.0068	0.0063	0.0049
01:00 - 02:00	0.0046	0.0044	0.0065	0.0066	0.0051	0.0066	0.0045
02:00 - 03:00	0.0050	0.0049	0.0059	0.0055	0.0047	0.0085	0.0065
03:00 - 04:00	0.0046	0.0064	0.0062	0.0054	0.0050	0.0059	0.0055
04:00 - 05:00	0.0064	0.0064	0.0053	0.0065	0.0046	0.0065	0.0044
05:00 - 06:00	0.0065	0.0053	0.0056	0.0050	0.0058	0.0066	0.0051
06:00 - 07:00	0.0040	0.0045	0.0063	0.0047	0.0043	0.0053	0.0050
07:00 - 08:00	0.0040	0.0042	0.0048	0.0041	0.0052	0.0051	0.0087
08:00 - 09:00	0.0066	0.0048	0.0053	0.0065	0.0047	0.0052	0.0060
09:00 - 10:00	0.0061	0.0047	0.0041	0.0054	0.0046	0.0049	0.0062
10:00 - 11:00	0.0049	0.0067	0.0062	0.0047	0.0045	0.0058	0.0065
11:00 - 12:00	0.0043	0.0065	0.0059	0.0055	0.0065	0.0051	0.0052
12:00 - 13:00	0.0041	0.0055	0.0047	0.0043	0.0068	0.0050	0.0067
Average-24Hr*	0.0056	0.0055	0.0056	0.0054	0.0054	0.0058	0.0056
Max-1Hr	0.0068	0.0067	0.0069	0.0067	0.0068	0.0069	0.0068
Min-1Hr	0.0040	0.0042	0.0041	0.0041	0.0041	0.0047	0.0042
Standard-1Hr	0.17 ppm(320 ug/cu.m)						
Standard-24Hr	-						

Remark : * Average time between 13:00-13:00

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

Preeda S.
(Miss Preeda Sonjai)
Technical Management Team

**Ambient Air Monitoring Results : Nitrogen dioxide
MTR-PTTGC, Branch 2 (Power Plant)**

Location : Ban Nong Feab

Monitor Period : 27 Aug 2024-03 Sep 2024

Analyzer Model : API 200A

Station No : SS2-01

Serial No : 2365

Site Operator : Mr. Phuwadech Kaewjirakulsri

Calibrator Model : Teledyne 700E

Serial No : 587

Calibration Gas Cylinder I.D. : EB0102326

Certified Date : 05 Jan 2024

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

Expire Date : 04 Jan 2025

Time	NO2 Concentration (ppm)						
	27-28 Aug 2024	28-29 Aug 2024	29-30 Aug 2024	30-31 Aug 2024	31-01 Sep 2024	01-02 Sep 2024	02-03 Sep 2024
11:00 - 12:00	0.0065	0.0098	0.0091	0.0060	0.0089	0.0089	0.0070
12:00 - 13:00	0.0075	0.0080	0.0098	0.0070	0.0065	0.0076	0.0063
13:00 - 14:00	0.0059	0.0072	0.0090	0.0077	0.0062	0.0097	0.0080
14:00 - 15:00	0.0079	0.0077	0.0059	0.0091	0.0071	0.0071	0.0092
15:00 - 16:00	0.0064	0.0096	0.0093	0.0065	0.0063	0.0098	0.0068
16:00 - 17:00	0.0068	0.0079	0.0078	0.0066	0.0074	0.0064	0.0063
17:00 - 18:00	0.0070	0.0063	0.0071	0.0085	0.0072	0.0078	0.0078
18:00 - 19:00	0.0080	0.0080	0.0097	0.0067	0.0083	0.0094	0.0082
19:00 - 20:00	0.0063	0.0064	0.0094	0.0076	0.0070	0.0068	0.0073
20:00 - 21:00	0.0096	0.0067	0.0083	0.0062	0.0074	0.0087	0.0058
21:00 - 22:00	0.0060	0.0085	0.0061	0.0079	0.0097	0.0070	0.0066
22:00 - 23:00	0.0096	0.0086	0.0079	0.0089	0.0093	0.0057	0.0066
23:00 - 00:00	0.0075	0.0075	0.0085	0.0074	0.0061	0.0066	0.0079
00:00 - 01:00	0.0062	0.0059	0.0065	0.0094	0.0067	0.0059	0.0075
01:00 - 02:00	0.0077	0.0086	0.0072	0.0064	0.0064	0.0073	0.0084
02:00 - 03:00	0.0075	0.0069	0.0081	0.0067	0.0088	0.0086	0.0060
03:00 - 04:00	0.0078	0.0061	0.0094	0.0069	0.0082	0.0070	0.0081
04:00 - 05:00	0.0090	0.0067	0.0092	0.0072	0.0071	0.0092	0.0084
05:00 - 06:00	0.0075	0.0082	0.0064	0.0093	0.0084	0.0083	0.0065
06:00 - 07:00	0.0074	0.0066	0.0083	0.0076	0.0095	0.0065	0.0076
07:00 - 08:00	0.0094	0.0086	0.0077	0.0066	0.0059	0.0067	0.0088
08:00 - 09:00	0.0090	0.0075	0.0085	0.0082	0.0068	0.0082	0.0059
09:00 - 10:00	0.0066	0.0097	0.0061	0.0062	0.0092	0.0072	0.0066
10:00 - 11:00	0.0063	0.0060	0.0069	0.0078	0.0091	0.0065	0.0085
Average-24Hr*	0.0075	0.0077	0.0079	0.0074	0.0076	0.0077	0.0072
Max-1Hr	0.0096	0.0097	0.0098	0.0094	0.0097	0.0098	0.0092
Min-1Hr	0.0059	0.0059	0.0059	0.0060	0.0059	0.0059	0.0058
Standard-1Hr	0.17 ppm(320 ug/cu.m)						
Standard-24Hr	-						

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

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

Preeda S.
(Miss Preeda Sonjai)
Technical Management Team

ภาคผนวก ง.3

ใบรับรองผลการตรวจวัดระดับเสียงทั่วไป



Noise Monitoring Result : Community Noise MTR-PTTGC, Branch 2 (Power Plant)

Location : The North of Fence Monitor Period : 27 Aug 2024-03 Sep 2024
SLM Model : Cirrus CR162B Serial No : G300769
Site Operator : Mr. Phuwandech Kaewjirakulsri

Calibrator Model : Cirrus CR:515 Serial No : 94296
Calibration Ref dB(A) : 94.0 Certified Date : 14 Feb 2024
SLM Reading / Adjust dB(A) : 93.7/0.0 Expire Date : 13 Feb 2025
Cal Sheet No. : CR-515-2024-250

Time	Equivalent Sound Pressure Level (dB(A))						
	27-28 Aug 2024	28-29 Aug 2024	29-30 Aug 2024	30-31 Aug 2024	31-01 Sep 2024	01-02 Sep 2024	02-03 Sep 2024
11:00 - 12:00	67.2	66.9	66.9	66.2	65.6	64.3	66.2
12:00 - 13:00	66.1	66.4	66.8	65.5	65.5	63.8	65.3
13:00 - 14:00	66.8	67.4	66.8	65.8	66.0	64.0	67.0
14:00 - 15:00	66.9	67.2	66.4	66.5	65.5	64.0	67.1
15:00 - 16:00	66.3	68.0	68.5	66.5	66.3	64.9	67.4
16:00 - 17:00	67.5	67.8	68.2	68.0	66.7	66.7	68.0
17:00 - 18:00	67.2	68.3	67.8	67.3	68.9	65.1	67.5
18:00 - 19:00	68.1	68.2	66.9	67.5	67.4	65.0	66.7
19:00 - 20:00	66.7	66.9	66.4	66.3	65.9	65.3	66.1
20:00 - 21:00	66.9	67.1	66.1	66.4	65.6	64.2	65.7
21:00 - 22:00	65.9	65.8	65.1	64.8	65.3	65.6	65.0
22:00 - 23:00	65.7	64.9	65.5	65.1	65.4	64.5	64.4
23:00 - 00:00	65.5	64.3	64.8	65.2	65.2	64.9	64.3
00:00 - 01:00	65.4	64.2	64.6	64.8	64.3	65.2	64.8
01:00 - 02:00	64.9	64.2	64.8	64.8	64.3	65.1	65.6
02:00 - 03:00	65.0	64.2	64.6	64.6	64.6	64.7	65.7
03:00 - 04:00	65.5	64.1	64.3	64.4	64.6	64.6	65.1
04:00 - 05:00	65.5	64.4	64.6	64.6	65.0	65.2	65.6
05:00 - 06:00	66.0	64.9	65.1	65.2	64.7	65.6	65.7
06:00 - 07:00	68.7	68.4	68.4	67.9	67.1	67.9	69.0
07:00 - 08:00	69.3	67.6	67.7	67.4	67.3	68.0	68.0
08:00 - 09:00	68.2	66.8	66.7	66.8	65.8	67.2	67.5
09:00 - 10:00	67.8	66.8	66.4	65.7	65.6	66.6	68.6
10:00 - 11:00	67.9	68.1	65.8	65.8	64.8	65.9	68.0
Leq(24)*	66.9	66.6	66.4	66.1	65.7	65.5	66.6
Ldn	72.6	71.9	72.0	71.9	71.7	71.9	72.4
Lmax **	90.8	90.7	100.8	96.0	94.3	92.6	89.6
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

Preeda S.
(Miss Preeda Somjai)
Technical Management Team



Noise Monitoring Result : Background Noise MTR-PTTGC, Branch 2 (Power Plant)

Location : The North of Fence Monitor Period : 27 Aug 2024-03 Sep 2024
SLM Model : Cirrus CR162B Serial No : G300769
Site Operator : Mr. Phuwandech Kaewjirakulsri

Calibrator Model : Cirrus CR:515 Serial No : 94296
Calibration Ref dB(A) : 94.0 Certified Date : 14 Feb 2024
SLM Reading / Adjust dB(A) : 93.7/0.0 Expire Date : 13 Feb 2025
Cal Sheet No. : CR-515-2024-250

Time	L90 (dB(A))						
	27-28 Aug 2024	28-29 Aug 2024	29-30 Aug 2024	30-31 Aug 2024	31-01 Sep 2024	01-02 Sep 2024	02-03 Sep 2024
11:00 - 12:00	64.7	64.5	64.4	63.2	62.7	62.5	62.8
12:00 - 13:00	64.4	64.5	64.3	63.3	63.3	61.9	62.9
13:00 - 14:00	64.5	64.7	64.3	63.1	63.9	62.0	63.7
14:00 - 15:00	64.4	65.0	64.1	63.4	63.6	62.2	64.5
15:00 - 16:00	64.1	65.8	64.6	63.5	63.7	62.7	64.2
16:00 - 17:00	64.8	65.5	65.1	64.1	64.0	62.8	64.5
17:00 - 18:00	65.1	65.7	65.0	64.3	64.2	62.9	64.5
18:00 - 19:00	65.0	65.4	64.6	63.9	64.1	63.6	64.1
19:00 - 20:00	64.9	64.9	64.4	64.0	63.9	63.2	64.2
20:00 - 21:00	64.6	64.9	63.9	63.8	64.0	62.9	63.5
21:00 - 22:00	64.8	64.6	63.9	63.8	63.9	63.0	63.5
22:00 - 23:00	64.7	63.7	63.9	63.7	64.1	63.7	63.2
23:00 - 00:00	64.5	63.3	63.7	63.7	63.8	62.9	63.2
00:00 - 01:00	64.3	63.3	63.6	63.8	63.5	63.6	63.6
01:00 - 02:00	64.1	63.1	63.7	64.0	63.5	64.1	63.4
02:00 - 03:00	64.2	63.6	63.8	63.6	63.8	63.7	64.6
03:00 - 04:00	64.7	63.3	63.6	63.6	64.1	63.8	64.5
04:00 - 05:00	64.4	63.6	63.7	64.1	64.3	64.4	64.4
05:00 - 06:00	64.4	63.7	63.7	63.9	63.5	64.1	64.0
06:00 - 07:00	65.0	64.3	64.4	64.3	64.1	64.4	66.4
07:00 - 08:00	65.5	64.4	64.3	64.1	63.6	64.3	65.7
08:00 - 09:00	64.6	63.6	63.6	63.9	63.1	63.6	65.6
09:00 - 10:00	65.0	64.0	63.5	63.5	62.9	63.4	65.5
10:00 - 11:00	64.8	64.7	63.4	63.2	62.7	63.0	65.2
L90(avg)*	64.7	64.4	64.1	63.8	63.7	63.3	64.3

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

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

Preeda S.
(Miss Preeda Somjai)
Technical Management Team

**Noise Monitoring Result : Community Noise**
MTR-PTTGC, Branch 2 (Power Plant)

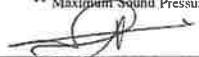
Location : The South of Fence Monitor Period : 30 Aug 2024-06 Sep 2024
SLM Model : Cirrus CR162B Serial No : G300892
Site Operator : Mr. Phuwardach Kaewjirakulsri


Calibrator Model : Cirrus CR515 Serial No : 94296
Calibration Ref dB(A) : 94.0 Certified Date : 14 Feb 2024
SLM Reading / Adjust dB(A) : 93.7/0.0 Expire Date : 13 Feb 2025
Cal Sheet No. : CR-515-2024-251

Time	Equivalent Sound Pressure Level (dB(A))						
	30-31 Aug 2024	31-01 Sep 2024	01-02 Sep 2024	02-03 Sep 2024	03-04 Sep 2024	04-05 Sep 2024	05-06 Sep 2024
15:00 - 16:00	59.6	60.3	60.3	58.8	58.9	59.5	61.2
16:00 - 17:00	61.6	60.0	60.0	60.4	60.4	59.5	60.5
17:00 - 18:00	60.1	59.4	59.4	59.4	60.2	58.9	60.7
18:00 - 19:00	60.9	59.1	59.1	60.6	60.0	58.6	61.6
19:00 - 20:00	59.3	58.3	58.3	58.9	58.9	58.4	60.1
20:00 - 21:00	59.4	57.8	57.8	59.7	58.2	59.3	59.7
21:00 - 22:00	59.5	57.9	57.9	59.7	57.9	59.0	59.9
22:00 - 23:00	59.0	58.9	58.9	60.0	57.0	59.5	60.0
23:00 - 00:00	58.4	59.4	59.1	60.3	58.7	59.8	59.8
00:00 - 01:00	58.3	58.9	59.7	59.8	59.2	58.2	59.1
01:00 - 02:00	58.6	60.9	60.3	61.8	61.3	58.1	58.9
02:00 - 03:00	58.4	60.0	59.6	62.2	61.7	57.9	58.5
03:00 - 04:00	58.9	59.8	59.8	60.3	59.8	58.3	58.5
04:00 - 05:00	58.7	59.4	59.4	60.1	59.0	58.2	58.9
05:00 - 06:00	58.6	59.0	59.0	60.0	58.5	58.0	58.8
06:00 - 07:00	59.1	59.1	59.4	62.9	58.9	58.5	59.3
07:00 - 08:00	60.1	60.1	61.7	62.6	61.2	59.5	60.0
08:00 - 09:00	61.8	61.8	60.2	63.3	59.7	61.2	61.8
09:00 - 10:00	61.1	60.6	61.1	62.1	60.6	60.2	61.7
10:00 - 11:00	61.8	59.1	60.3	61.0	60.4	61.7	61.0
11:00 - 12:00	59.3	59.3	60.1	61.4	60.3	60.7	61.1
12:00 - 13:00	58.9	58.9	59.4	59.3	58.4	60.4	59.9
13:00 - 14:00	63.7	63.6	61.3	61.4	63.2	62.6	60.3
14:00 - 15:00	61.8	62.1	59.7	59.6	61.3	60.0	60.2
Leq(24)*	60.1	60.0	59.7	60.8	60.0	59.6	60.2
Ldn	65.5	66.0	65.8	67.3	66.1	65.2	65.8
Lmax**	99.2	84.1	92.2	89.7	92.9	85.0	83.3
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-PTTGC, Branch 2 (Power Plant)


Location : The South of Fence Monitor Period : 30 Aug 2024-06 Sep 2024
SLM Model : Cirrus CR162B Serial No : G300892
Site Operator : Mr. Phuwardach Kaewjirakulsri

Calibrator Model : Cirrus CR515 Serial No : 94296
Calibration Ref dB(A) : 94.0 Certified Date : 14 Feb 2024
SLM Reading / Adjust dB(A) : 93.7/0.0 Expire Date : 13 Feb 2025
Cal Sheet No. : CR-515-2024-251

Time	L90 (dB(A))						
	30-31 Aug 2024	31-01 Sep 2024	01-02 Sep 2024	02-03 Sep 2024	03-04 Sep 2024	04-05 Sep 2024	05-06 Sep 2024
15:00 - 16:00	57.2	57.7	57.7	56.9	56.9	57.4	59.0
16:00 - 17:00	57.1	57.9	57.9	57.9	57.9	57.4	58.8
17:00 - 18:00	57.5	58.0	58.0	56.7	56.7	57.5	58.5
18:00 - 19:00	58.1	57.7	57.7	57.3	57.3	57.2	59.1
19:00 - 20:00	57.8	57.3	57.3	57.4	57.4	56.9	58.8
20:00 - 21:00	58.0	56.7	56.7	57.9	56.7	57.4	58.7
21:00 - 22:00	57.9	56.6	56.6	57.7	56.6	57.2	58.9
22:00 - 23:00	57.7	56.7	56.0	58.1	56.0	57.5	58.9
23:00 - 00:00	57.4	56.8	56.6	57.8	56.2	57.3	58.9
00:00 - 01:00	57.3	56.8	57.6	57.8	57.2	56.8	58.2
01:00 - 02:00	57.5	57.3	58.3	58.3	57.7	57.0	58.1
02:00 - 03:00	57.4	58.5	58.3	60.2	59.7	56.9	57.8
03:00 - 04:00	57.6	58.1	58.1	58.9	58.3	57.2	57.8
04:00 - 05:00	57.5	57.7	57.7	58.4	57.3	57.1	58.1
05:00 - 06:00	57.8	57.8	57.8	58.4	57.3	56.9	58.1
06:00 - 07:00	57.9	57.8	57.9	60.0	57.4	56.9	58.0
07:00 - 08:00	58.4	58.4	58.4	60.4	57.9	57.8	57.8
08:00 - 09:00	59.3	59.3	57.8	60.5	57.3	58.7	58.7
09:00 - 10:00	58.6	58.1	58.0	59.4	57.4	58.2	58.9
10:00 - 11:00	58.5	57.8	57.8	58.6	58.0	59.5	58.6
11:00 - 12:00	57.6	57.6	57.5	58.5	57.3	59.0	58.7
12:00 - 13:00	57.5	57.5	57.5	57.5	57.0	58.9	58.3
13:00 - 14:00	57.6	57.8	57.3	57.4	57.3	59.0	58.4
14:00 - 15:00	58.1	58.1	57.7	57.7	57.6	58.6	58.5
L90(avg)*	57.8	57.7	57.6	58.5	57.4	57.8	58.5

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


(Miss Katesarin Vorradetwittaya)
Environmental Scientist


(Miss Preeda Somjai)
Technical Management Team

ภาคผนวก ง.4

ใบรับรองผลการตรวจวิเคราะห์คุณภาพน้ำ



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

WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Company Limited , REQUEST SERVICE No. : 1428/67
Branch 2 (Power Plant) SAMPLING METHOD : Grab
SAMPLING BY : SECOT Co., Ltd. SAMPLING TIME : 11:15
SAMPLING DATE : 11/07/2024 ANALYTICAL DATE : 12-18/07/2024
RECEIVED DATE : 12/07/2024 SITE OPERATOR : Mr. Aniwat Pimwanna
REPORT DATE : 19/07/2024 FILE CODE : 224007_WW_July
SAMPLE CONDITION : Normal
LOCATION DESCRIPTION : I = ก่อนปล่อยลงสู่คลองระบายน้ำทิ้งของนิคมฯ (Final Check Basin)

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION	
				I	STANDARD ^u
Temperature	°C	2550 B	< 0.5	32.5	≤ 40
pH	-	4500-H ¹ B	< 0.10	7.38	5.5-9.0
Total Dissolved Solids	mg/l	2540 C	< 50	2.722	26,200 ^u
Total Suspended Solids	mg/l	2540 D	< 5	< 5	≤ 50
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	≤ 5
Phenols	mg/l	5530 B,C	< 0.001	ND	≤ 1
BOD ₅	mg/l	5210 B	< 1.0	< 1.0	≤ 20
COD	mg/l	5220 C	< 15.00	49.58	≤ 120
Free Cl ₂	mg/l	4500-Cl G	< 0.01	ND	≤ 1
Nitrate	mg/l	4500-NO ₃ ⁻ E	< 0.02	0.14	≤ 10
TKN	mg/l	4500-Norg B	< 0.20	4.8	≤ 100
Copper (Cu)	mg/l	3120 B	< 0.001	< 0.02	≤ 2
Iron (Fe)	mg/l	3500-Fe B	< 0.05	0.14	≤ 1
Zinc (Zn)	mg/l	3120 B	< 0.003	0.87	≤ 5

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

Bongpa Puthum

(Miss Pornnapa Budthum)

Analyst

REG. NO. 2-239-0-0018

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 2-239-0-0004

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

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

3. ^u Notification of the Ministry of Natural Resources and Environment B.E.2565 (2022).

4. ^u In case of discharging effluent into water resources containing TDS of more than 3,000 mg/l, TDS in the effluent to be discharged must exceed TDS in the water resources by not more than 5,000 mg/l (Measurement Results of Coastal Water on July 11, 2024 found to be 21,200 mg/l therefore the Standard of TDS found to be 26,200 mg/l).

5. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Company Limited , REQUEST SERVICE No. : 1429/67
Branch 2 (Power Plant) SAMPLING METHOD : Grab
SAMPLING BY : SECOT Co., Ltd. SAMPLING TIME : 10:15
SAMPLING DATE : 11/07/2024 ANALYTICAL DATE : 12-19/07/2024
RECEIVED DATE : 12/07/2024 SITE OPERATOR : Mr. Chanapon Oakkharaplon
REPORT DATE : 19/07/2024 FILE CODE : 224007_SW_July
SAMPLE CONDITION : Normal
LOCATION DESCRIPTION : 1 = คลองระบายน้ำทิ้งของนิคมฯ ก่อนปล่อยน้ำของโรงโม่หิน

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION	
				1	STANDARD ^u
Temperature	°C	2550 B	< 0.5	29.0	u
pH	-	4500-H ¹ B	< 0.10	8.78	u
Total Dissolved Solids	mg/l	2540 C	< 50	2.288	u
Total Suspended Solids	mg/l	2540 D	< 5	114	u
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	u
Phenols	mg/l	5530 B,C	< 0.001	ND	u
BOD ₅	mg/l	5210 B	< 1.0	1.6	u
COD	mg/l	5220 C	< 15.00	24.42	u

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

Khemchuda Insom

(Miss Khemchuda Insom)

Analyst

Araya Tipparuk

(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. ^u Notification of the National Environment Board No.8 B.E.2537 (1994).

Subject Determining water quality standards in Surface Water Sources for Surface Water Class 5.

4. ^u No standard.

5. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Company Limited , REQUEST SERVICE No. : 1429/67
Branch 2 (Power Plant) SAMPLING METHOD : Grab
SAMPLING BY : SECOT Co., Ltd. SAMPLING TIME : 10:36
SAMPLING DATE : 11/07/2024 ANALYTICAL DATE : 12-19/07/2024
RECEIVED DATE : 12/07/2024 SITE OPERATOR : Mr.Chanapon Oakkharaplon
REPORT DATE : 19/07/2024 FILE CODE : 224007_SW_July
SAMPLE CONDITION : Normal
LOCATION DESCRIPTION : 2 = คลองระบายน้ำทิ้งของนิคมฯ หลังจุดปล่อยน้ำของโรงโม่หินสี

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION 2	STANDARD ¹⁾
Temperature	°C	2550 B	< 0.5	29.4	2)
pH	-	4500-H ⁺ B	< 0.10	7.71	2)
Total Dissolved Solids	mg/l	2540 C	< 50	1,302	2)
Total Suspended Solids	mg/l	2540 D	< 5	22	2)
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	2)
Phenols	mg/l	5530 B,C	< 0.001	ND	2)
BOD ₅	mg/l	5210 B	< 1.0	1.1	2)
COD	mg/l	5220 C	< 15.00	19.98	2)

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

Khemchuda Insorn

(Miss Khemchuda Insorn)

Analyst

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

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Subject Determining water quality standards in Surface Water Sources for Surface Water Class 5.

4. ²⁾ No standard.

5. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Company Limited , REQUEST SERVICE No. : 1604/67
Branch 2 (Power Plant) SAMPLING METHOD : Grab
SAMPLING BY : SECOT Co., Ltd. SAMPLING TIME : 10:41
SAMPLING DATE : 08/08/2024 ANALYTICAL DATE : 09-17/08/2024
RECEIVED DATE : 09/08/2024 SITE OPERATOR : Miss Salisa Aintree
REPORT DATE : 19/08/2024 FILE CODE : 224006_WW_August
SAMPLE CONDITION : Normal
LOCATION DESCRIPTION : 1 = ก่อนปล่อยลงสู่คลองระบายน้ำทิ้งของนิคมฯ (Final Check Basin)

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION 1	STANDARD ¹⁾
Temperature	°C	2550 B	< 0.5	36.3	≤ 40
pH	-	4500-H ⁺ B	< 0.10	7.35	5.5-9.0
Total Dissolved Solids	mg/l	2540 C	< 50	3,400	36,280 ²⁾
Total Suspended Solids	mg/l	2540 D	< 5	< 5	≤ 50
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	≤ 5
Phenols	mg/l	5530 B,C	< 0.001	ND	≤ 1
BOD ₅	mg/l	5210 B	< 1.0	< 1.0	< 20
COD	mg/l	5220 C	< 15.00	80.64	≤ 120
Free Cl ₂	mg/l	4500-Cl G	< 0.01	ND	≤ 1
Nitrate	mg/l	4500-NO ₃ ⁻ E	< 0.02	0.48	≤ 10
TKN	mg/l	4500-Norg B	< 0.20	3.8	≤ 100
Copper (Cu)	mg/l	3120 H	< 0.001	< 0.02	≤ 2
Iron (Fe)	mg/l	3500-Fe B	< 0.05	0.15	≤ 1
Zinc (Zn)	mg/l	3120 B	< 0.003	0.84	≤ 5

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

Pomnopa Budthum

(Miss Pomnopa Budthum)

Analyst

REG. NO. 7-239-0-0018

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-0-0004

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3. ¹⁾ Notification of the Ministry of Natural Resources and Environment B.E.2565 (2022).

4. ²⁾ In case of discharging effluent into water resources containing TDS of more than 3,000 mg/l, TDS in the effluent to be discharged must exceed TDS in the water resources by not more than 5,000 mg/l (Measurement Results of Coastal Water on August 08, 2024 found to be 31,280 mg/l therefore the Standard of TDS found to be 36,280 mg/l).

5. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Company Limited , REQUEST SERVICE No. : 1603/67
Branch 2 (Power Plant) SAMPLING METHOD : Grab
SAMPLING BY : SECOT Co., Ltd. SAMPLING TIME : 14:19
SAMPLING DATE : 08/08/2024 ANALYTICAL DATE : 09-16/08/2024
RECEIVED DATE : 09/08/2024 SITE OPERATOR : Mr. Chitpon Somprasong
REPORT DATE : 17/08/2024 FILE CODE : 224007_SW_August
SAMPLE CONDITION : Normal
LOCATION DESCRIPTION : 1 = คลองระบายน้ำทิ้งของนิคมฯ ก่อนจุดปล่อยน้ำของโรงโม่หิน

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION 1	STANDARD ^{1/}
Temperature	°C	2550 B	< 0.5	32.7	2/
pH	-	4500-H ¹ B	< 0.10	8.39	2/
Total Dissolved Solids	mg/l	2540 C	< 50	5,024	2/
Total Suspended Solids	mg/l	2540 D	< 5	48	2/
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	2/
Phenols	mg/l	5530 B,C	< 0.001	ND	2/
BOD ₅	mg/l	5210 B	< 1.0	1.3	2/
COD	mg/l	5220 C	< 15.00	68.13	2/

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

Khemchuda Insorn

(Miss Khemchuda Insorn)

Analyst

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

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3. ^{1/} Notification of the National Environment Board No.8 B.E.2537 (1994).

Subject Determining water quality standards in Surface Water Sources for Surface Water Class 5.

4. ^{2/} No standard.

5. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Company Limited , REQUEST SERVICE No. : 1603/67
Branch 2 (Power Plant) SAMPLING METHOD : Grab
SAMPLING BY : SECOT Co., Ltd. SAMPLING TIME : 14:15
SAMPLING DATE : 08/08/2024 ANALYTICAL DATE : 09-16/08/2024
RECEIVED DATE : 09/08/2024 SITE OPERATOR : Mr. Chitpon Somprasong
REPORT DATE : 17/08/2024 FILE CODE : 224007_SW_August
SAMPLE CONDITION : Normal
LOCATION DESCRIPTION : 2 = คลองระบายน้ำทิ้งของนิคมฯ หลังจุดปล่อยน้ำของโรงโม่หิน

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION 2	STANDARD ^{1/}
Temperature	°C	2550 B	< 0.5	34.6	2/
pH	-	4500-H ¹ B	< 0.10	8.36	2/
Total Dissolved Solids	mg/l	2540 C	< 50	1,476	2/
Total Suspended Solids	mg/l	2540 D	< 5	11	2/
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	2/
Phenols	mg/l	5530 B,C	< 0.001	ND	2/
BOD ₅	mg/l	5210 B	< 1.0	1.4	2/
COD	mg/l	5220 C	< 15.00	66.74	2/

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

Khemchuda Insorn

(Miss Khemchuda Insorn)

Analyst

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

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Subject Determining water quality standards in Surface Water Sources for Surface Water Class 5.

4. ^{2/} No standard.

5. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Company Limited , REQUEST SERVICE No. : 1898/67
Branch 2 (Power Plant) SAMPLING METHOD : Grab
SAMPLING BY : SECOT Co., Ltd. SAMPLING TIME : 10:15
SAMPLING DATE : 12/09/2024 ANALYTICAL DATE : 13-19/09/2024
RECEIVED DATE : 13/09/2024 SITE OPERATOR : Miss Thipsuda Wannakran
REPORT DATE : 20/09/2024 FILE CODE : 224007_WW_September
SAMPLE CONDITION : Normal
LOCATION DESCRIPTION : 1 = ก่อนปล่อยสู่คลองระบายน้ำทิ้งของนิคมฯ (Final Check Basin)

PARAMETER	UNIT	ANALYSIS	ND	STATION	STANDARD ^{1/}
		METHODS	(non-detectable)	1	
Temperature	°C	2550 B	< 0.5	34.5	≤ 40
pH	-	4500-H ¹ B	< 0.10	7.55	5.5-9.0
Total Dissolved Solids	mg/l	2540 C	< 50	3,192	36,860 ^{2/}
Total Suspended Solids	mg/l	2540 D	< 5	< 5	≤ 50
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	≤ 5
Phenols	mg/l	5530 B,C	< 0.001	ND	≤ 1
BOD ₅	mg/l	5210 B	< 1.0	1.4	≤ 20
COD	mg/l	5220 C	< 15.00	52.22	≤ 120
Free Cl ₂	mg/l	4500-Cl G	< 0.01	0.04	≤ 1
Nitrate	mg/l	4500-NO ₃ -E	< 0.02	0.25	≤ 10
TKN	mg/l	4500-Norg B	< 0.20	4.0	≤ 100
Copper (Cu)	mg/l	3120 B	< 0.001	< 0.02	≤ 2
Iron (Fe)	mg/l	3500-Fe B	< 0.05	0.25	≤ 1
Zinc (Zn)	mg/l	3120 B	< 0.003	0.97	≤ 5

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

(Miss Pornnapa Budthum)

Analyst

REG. NO. 7-239-9-0018

(Mrs. Araya Tippiarak)

Technical Management Team

REG. NO. 7-239-9-0004

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3. ^{1/} Notification of the Ministry of Natural Resources and Environment B.E.2565 (2022).

4. ^{2/} In case of discharging effluent into water resources containing TDS of more than 3,000 mg/l, TDS in the effluent to be discharged must exceed TDS in the water resources by not more than 5,000 mg/l (Measurement Results of Coastal Water on September 12, 2024 found to be 31,860 mg/l therefore the Standard of TDS found to be 36,860 mg/l).

5. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Company Limited , REQUEST SERVICE No. : 1897/67
Branch 2 (Power Plant) SAMPLING METHOD : Grab
SAMPLING BY : SECOT Co., Ltd. SAMPLING TIME : 11:20
SAMPLING DATE : 12/09/2024 ANALYTICAL DATE : 13-19/09/2024
RECEIVED DATE : 13/09/2024 SITE OPERATOR : Miss Thipsuda Wannakran
REPORT DATE : 20/09/2024 FILE CODE : 224007_SW_September
SAMPLE CONDITION : Normal
LOCATION DESCRIPTION : 1 = คลองระบายน้ำทิ้งของนิคมฯ ก่อนจุดปล่อยน้ำของโรงโม่หินสี

PARAMETER	UNIT	ANALYSIS	ND	STATION	STANDARD ^{1/}
		METHODS	(non-detectable)	1	
Temperature	°C	2550 B	< 0.5	32.5	2/
pH	-	4500-H ¹ B	< 0.10	7.80	2/
Total Dissolved Solids	mg/l	2540 C	< 50	3,692	2/
Total Suspended Solids	mg/l	2540 D	< 5	48	2/
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	2/
Phenols	mg/l	5530 B,C	< 0.001	ND	2/
BOD ₅	mg/l	5210 B	< 1.0	2.0	2/
COD	mg/l	5220 C	< 15.00	21.50	2/

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

(Miss Khemchuda Insorn)

Analyst

(Mrs. Araya Tippiarak)

Technical Management Team

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3. ^{1/} Notification of the National Environment Board No.8 B.E.2537 (1994).

Subject Determining water quality standards in Surface Water Sources for Surface Water Class 5.

4. ^{2/} No standard.

5. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Company Limited , REQUEST SERVICE No. : 1897/67
Branch 2 (Power Plant) SAMPLING METHOD : Grab
SAMPLING BY : SECOT Co., Ltd. SAMPLING TIME : 11:10
SAMPLING DATE : 12/09/2024 ANALYTICAL DATE : 13-19/09/2024
RECEIVED DATE : 13/09/2024 SITE OPERATOR : Miss Thipsuda Wannakran
REPORT DATE : 20/09/2024 FILE CODE : 224007_SW_September
SAMPLE CONDITION : Normal
LOCATION DESCRIPTION : 2 = คลองระบายน้ำทิ้งของนิคมฯ หลังจุดปล่อยน้ำของโรงโม่หิน

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION 2	STANDARD ^{1/}
Temperature	°C	2550 B	< 0.5	32.6	2/
pH		4500-H ¹ B	< 0.10	8.16	2/
Total Dissolved Solids	mg/l	2540 C	< 50	1,932	2/
Total Suspended Solids	mg/l	2540 D	< 5	12	2/
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	2/
Phenols	mg/l	5530 B,C	< 0.001	ND	2/
BOD ₅	mg/l	5210 B	< 1.0	1.8	2/
COD	mg/l	5220 C	< 15.00	21.50	2/

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

(Miss Khemchuda Insorn)

Analyst

(Mrs. Araya Tipparak)

Technical Management Team

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4. ^{2/} No standard.

5. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Company Limited , REQUEST SERVICE No. : 2092/67
Branch 2 (Power Plant) SAMPLING METHOD : Grab
SAMPLING BY : SECOT Co., Ltd. SAMPLING TIME : 10:15
SAMPLING DATE : 10/10/2024 ANALYTICAL DATE : 11-18/10/2024
RECEIVED DATE : 11/10/2024 SITE OPERATOR : Miss Thipsuda Wannakran
REPORT DATE : 19/10/2024 FILE CODE : 224007_WW_October
SAMPLE CONDITION : Normal
LOCATION DESCRIPTION : 1 = ก่อนปล่อยสู่คลองระบายน้ำทิ้งของนิคมฯ (Final Check Basin)

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION 1	STANDARD ^{1/}
Temperature	°C	2550 B	< 0.5	32.7	≤ 40
pH		4500-H ¹ B	< 0.10	7.87	5.5-9.0
Total Dissolved Solids	mg/l	2540 C	< 50	2,218	30,280 ^{2/}
Total Suspended Solids	mg/l	2540 D	< 5	< 5	≤ 50
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	≤ 5
Phenols	mg/l	5530 B,C	< 0.001	ND	< 1
HDD ₅	mg/l	5210 B	< 1.0	1.4	≤ 20
COD	mg/l	5220 C	< 15.00	26.88	≤ 120
Free Cl ₂	mg/l	4500-Cl G	< 0.01	0.05	≤ 1
Nitrate	mg/l	4500-NO ₃ -E	< 0.02	0.66	≤ 10
TKN	mg/l	4500-Norg B	< 0.20	1.3	≤ 100
Copper (Cu)	mg/l	3120 B	< 0.001	< 0.02	≤ 2
Iron (Fe)	mg/l	3500-Fe B	< 0.05	0.16	≤ 1
Zinc (Zn)	mg/l	3120 B	< 0.003	0.44	≤ 5

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

(Miss Ponnapa Budthum)

Analyst

REG. NO. 7-239-0-0018

(Mrs. Araya Tipparak)

Technical Management Team

REG. NO. 7-239-0-0004

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3. ^{1/} Notification of the Ministry of Natural Resources and Environment B.E.2565 (2022).

4. ^{2/} In case of discharging effluent into water resources containing TDS of more than 3,000 mg/l. TDS in the effluent to be discharged must exceed TDS in the water resources by not more than 5,000 mg/l (Measurement Results of Coastal Water on October 10, 2024 found to be 25,280 mg/l therefore the Standard of TDS found to be 30,280 mg/l).

5. - Not available.



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

WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Company Limited , REQUEST SERVICE No. : 2091/67
Branch 2 (Power Plant) SAMPLING METHOD : Grab
SAMPLING BY : SECOT Co., Ltd. SAMPLING TIME : 10:16
SAMPLING DATE : 10/10/2024 ANALYTICAL DATE : 11-18/10/2024
RECEIVED DATE : 11/10/2024 SITE OPERATOR : Mr.Rommadon Lemmad
REPORT DATE : 19/10/2024 FILE CODE : 224007_SW_September
SAMPLE CONDITION : Normal
LOCATION DESCRIPTION : 1 = คลองระบายน้ำทิ้งของนิคมฯ ก่อนจุดปล่อยน้ำของโรงโม่หิน

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION 1	STANDARD ^{1/}
Temperature	°C	2550 B	< 0.5	32.8	2/
pH		4500-H ^{1/} B	< 0.10	8.85	2/
Total Dissolved Solids	mg/l	2540 C ^{1/}	< 50	2,896	2/
Total Suspended Solids	mg/l	2540 D	< 5	72	2/
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	2/
Phenols	mg/l	5530 B,C	< 0.001	ND	2/
BOD ₅	mg/l	5210 B	< 1.0	1.4	2/
COD	mg/l	5220 C	< 15.00	19.20	2/

REFERENCE: STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER, 21ST ED., 2012 (AWWA, APHA, WEF)

(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. ^{1/} Notification of the National Environment Board No.8 B.E.2537 (1994).

Subject Determining water quality standards in Surface Water Sources for Surface Water Class 5.

4. ^{2/} No standard.

5. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Company Limited , REQUEST SERVICE No. : 2091/67
Branch 2 (Power Plant) SAMPLING METHOD : Grab
SAMPLING BY : SECOT Co., Ltd. SAMPLING TIME : 10:25
SAMPLING DATE : 10/10/2024 ANALYTICAL DATE : 11-18/10/2024
RECEIVED DATE : 11/10/2024 SITE OPERATOR : Mr.Rommadon Lemmad
REPORT DATE : 19/10/2024 FILE CODE : 224007_SW_September
SAMPLE CONDITION : Normal
LOCATION DESCRIPTION : 2 = คลองระบายน้ำทิ้งของนิคมฯ หลังจุดปล่อยน้ำของโรงโม่หิน

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION 2	STANDARD ^{1/}
Temperature	°C	2550 B	< 0.5	31.8	2/
pH		4500-H ^{1/} B	< 0.10	7.89	2/
Total Dissolved Solids	mg/l	2540 C	< 50	944	2/
Total Suspended Solids	mg/l	2540 D	< 5	7	2/
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	2/
Phenols	mg/l	5530 B,C	< 0.001	ND	2/
BOD ₅	mg/l	5210 B	< 1.0	1.5	2/
COD	mg/l	5220 C	< 15.00	15.36	2/

REFERENCE: STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER, 21ST ED., 2012 (AWWA, APHA, WEF)

(Miss Khemchuda Insorn)
Analyst

(Mrs. Araya Tipparuk)
Technical Management Team

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4. ^{2/} No standard.

5. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Company Limited , REQUEST SERVICE No. : 2352/67
Branch 2 (Power Plant)
SAMPLING METHOD : Grab
SAMPLING BY : SECOT Co., Ltd. SAMPLING TIME : 09:20
SAMPLING DATE : 14/11/2024 ANALYTICAL DATE : 15-22/11/2024
RECEIVED DATE : 15/11/2024 SITE OPERATOR : Mr.Natthachai Chaiyakhot
REPORT DATE : 22/11/2024 FILE CODE : 224007_WW_November
SAMPLE CONDITION : Normal
LOCATION DESCRIPTION : 1 = ก่อนปล่อยทิ้งสู่คลองระบายน้ำทิ้งของนิคมฯ (Final Check Basin)

PARAMETER	UNIT	ANALYSIS	ND	STATION	STANDARD ¹⁾
		METHODS	(non-detectable)	I	
Temperature	°C	2550 B	< 0.5	31.1	≤ 40
pH	-	4500-H ⁺ B	< 0.10	7.28	5.5-9.0
Total Dissolved Solids	mg/l	2540 C	< 50	1.285	35,640 ²⁾
Total Suspended Solids	mg/l	2540 D	< 5	< 5	≤ 50
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	≤ 5
Phenols	mg/l	5530 B,C	< 0.001	ND	≤ 1
BOD ₅	mg/l	5210 B	< 1.0	< 1.0	≤ 20
COD	mg/l	5220 C	< 15.00	< 15.00	≤ 120
Free Cl ₂	mg/l	4500-Cl ₂ G	< 0.01	0.03	≤ 1
Nitrate	mg/l	4500-NO ₃ ⁻ E	< 0.02	0.31	≤ 10
TKN	mg/l	4500-Norg B	< 0.20	1.1	≤ 100
Copper (Cu)	mg/l	3120 B	< 0.001	< 0.02	≤ 2
Iron (Fe)	mg/l	3500-Fe B	< 0.05	0.45	≤ 1
Zinc (Zn)	mg/l	3120 B	< 0.003	0.50	≤ 5

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

(Miss Ponnapa Budthum)

Analyst

REG. NO. 7-239-0-0018

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-0-0004

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

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

3. ¹⁾ Notification of the Ministry of Natural Resources and Environment B.E.2565 (2022).

4. ²⁾ In case of discharging effluent into water resources containing TDS of more than 3,000 mg/l, TDS in the effluent to be discharged must exceed TDS in the water resources by not more than 5,000 mg/l (Measurement Results of Coastal Water on November 14, 2024 found to be 30,640 mg/l therefore the Standard of TDS found to be 35,640 mg/l).

5. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Company Limited , REQUEST SERVICE No. : 2351/67
Branch 2 (Power Plant)
SAMPLING METHOD : Grab
SAMPLING BY : SECOT Co., Ltd. SAMPLING TIME : 10:30
SAMPLING DATE : 14/11/2024 ANALYTICAL DATE : 15-22/11/2024
RECEIVED DATE : 15/11/2024 SITE OPERATOR : Mr.Tanachot Changlor
REPORT DATE : 25/11/2024 FILE CODE : 224007_SW_November
SAMPLE CONDITION : Normal
LOCATION DESCRIPTION : 1 = คลองระบายน้ำทิ้งของนิคมฯ ก่อนจุดปล่อยน้ำของโรงโม่หิน

PARAMETER	UNIT	ANALYSIS	ND	STATION	STANDARD ^{1/}
		METHODS		I	
Temperature	°C	2550 B	< 0.5	30.8	2/
pH	-	4500-H ⁺ B	< 0.10	8.32	2/
Total Dissolved Solids	mg/l	2540 C	< 50	4.562	2/
Total Suspended Solids	mg/l	2540 D	< 5	59	2/
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	2/
Phenols	mg/l	5530 B,C	< 0.001	ND	2/
BOD ₅	mg/l	5210 B	< 1.0	< 1.0	2/
COD	mg/l	5220 C	< 15.00	< 15.00	2/

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

(Miss Khemchuda Insorn)

Analyst

(Mrs. Araya Tipparuk)

Technical Management Team

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

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3. ¹⁾ Notification of the National Environment Board No.8 B.E.2537 (1994).

Subject Determining water quality standards in Surface Water Sources for Surface Water Class 5.

4. ²⁾ No standard.

5. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Company Limited , REQUEST SERVICE No. : 2351/67
Branch 2 (Power Plant) SAMPLING METHOD : Grab
SAMPLING BY : SECOT Co., Ltd. SAMPLING TIME : 10:40
SAMPLING DATE : 14/11/2024 ANALYTICAL DATE : 15-22/11/2024
RECEIVED DATE : 15/11/2024 SITE OPERATOR : Mr.Tanachot Changlor
REPORT DATE : 25/11/2024 FILE CODE : 224007_SW_November
SAMPLE CONDITION : Normal
LOCATION DESCRIPTION : 2 = คลองระบายน้ำทิ้งของนิคมฯ หลังจุดปล่อยน้ำของโรงโม่หินสี

PARAMETER	UNIT	ANALYSIS	ND	STATION	STANDARD ^{1/}
		METHODS	(non-detectable)	2	
Temperature	°C	2550 B	< 0.5	31.5	2
pH		4500-H ² B	< 0.10	7.68	2
Total Dissolved Solids	mg/l	2540 C	< 50	1,358	2
Total Suspended Solids	mg/l	2540 D	< 5	6	2
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	2
Phenols	mg/l	5530 B,C	< 0.001	ND	2
BOD ₅	mg/l	5210 B	< 1.0	1.6	2
COD	mg/l	5220 C	< 15.00	27.47	2

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 21st ED., 2012 (AWWA, APHA, WEF)

Khenshuda Insorn

(Miss Khenshuda Insorn)

Analyst

Araya Tipparak

(Mrs. Araya Tipparak)

Technical Management Team

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3. ^{1/} Notification of the National Environment Board No.8 B.E.2537 (1994).
Subject Determining water quality standards in Surface Water Sources for Surface Water Class 5.
4. ^{2/} No standard.
5. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Company Limited , REQUEST SERVICE No. : 2605/67
Branch 2 (Power Plant) SAMPLING METHOD : Grab
SAMPLING BY : SECOT Co., Ltd. SAMPLING TIME : 09:54
SAMPLING DATE : 12/12/2024 ANALYTICAL DATE : 13-20/12/2024
RECEIVED DATE : 13/12/2024 SITE OPERATOR : Miss Wiraya Palchimboon
REPORT DATE : 20/12/2024 FILE CODE : 224007_WW_December
SAMPLE CONDITION : Normal
LOCATION DESCRIPTION : 1 = ก่อนปล่อยลงสู่คลองระบายน้ำทิ้งของนิคมฯ (Final Check Basin)

PARAMETER	UNIT	ANALYSIS	ND	STATION	STANDARD ^{1/}
		METHODS	(non-detectable)	1	
Temperature	°C	2550 B	< 0.5	31.2	≤ 40
pH		4500-H ² B	< 0.10	7.59	5.5-9.0
Total Dissolved Solids	mg/l	2540 C	< 50	2,119	43,940 ^{2/}
Total Suspended Solids	mg/l	2540 D	< 5	6	≤ 50
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	≤ 5
Phenols	mg/l	5530 B,C	< 0.001	ND	≤ 1
BOD ₅	mg/l	5210 B	< 1.0	1.9	< 20
COD	mg/l	5220 C	< 15.00	< 15.00	≤ 120
Free Cl ₂	mg/l	4500-Cl G	< 0.01	0.03	≤ 1
Nitrate*	mg/l	4500-NO3 -E	< 0.02	1.4	≤ 10
TKN	mg/l	4500-Norg B	< 0.20	1.6	≤ 100
Copper (Cu)	mg/l	3120 B	< 0.001	< 0.02	≤ 2
Iron (Fe)*	mg/l	3500-Fe B	< 0.05	0.82	≤ 1
Zinc (Zn)	mg/l	3120 B	< 0.003	0.72	≤ 5

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 21st ED., 2012 (AWWA, APHA, WEF)

Pornnapa Budthum

(Miss Pornnapa Budthum)

Analyst

REG. NO. 7-239-8-0018

Araya Tipparak

(Mrs. Araya Tipparak)

Technical Management Team

REG. NO. 7-239-8-0004

- Remark : 1. Reported analysis refers to submitted sample only.
2. This report shall not be reproduced, except in full, without official approval.
3. ^{1/} Notification of the Ministry of Natural Resources and Environment B.E.2565 (2022).
4. ^{2/} In case of discharging effluent into water resources containing TDS of more than 3,000 mg/l, TDS in the effluent to be discharged must exceed TDS in the water resources by not more than 5,000 mg/l (Measurement Results of Coastal Water on December 12, 2024 found to be 38,940 mg/l therefore the Standard of TDS found to be 43,940 mg/l).
5. * Not registered with the Department of Industrial Works.
6. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Company Limited , REQUEST SERVICE No. : 2606/67
Branch 2 (Power Plant) SAMPLING METHOD : Grab
SAMPLING BY : SECOT Co., Ltd. SAMPLING TIME : 10:19
SAMPLING DATE : 12/12/2024 ANALYTICAL DATE : 13-20/12/2024
RECEIVED DATE : 13/12/2024 SITE OPERATOR : Mr.Tanachot Changlor
REPORT DATE : 20/12/2024 FILE CODE : 224007_SW_December
SAMPLE CONDITION : Normal
LOCATION DESCRIPTION : 1 = คลองระบายน้ำทิ้งของนิคมฯ ก่อนจุดปล่อยน้ำของโรงโม่หินสี

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION	STANDARD ^{1/}
				1	
Temperature	°C	2550 B	< 0.5	31.2	2/
pH	-	4500-H ⁺ B	< 0.10	8.77	2/
Total Dissolved Solids	mg/l	2540 C	< 50	7,283	2/
Total Suspended Solids	mg/l	2540 D	< 5	52	2/
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	2/
Phenols	mg/l	5530 B,C	< 0.001	ND	2/
BOD ₅	mg/l	5210 B	< 1.0	1.2	2/
COD	mg/l	5220 C	< 15.00	< 15.00	2/

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

(Miss Khemchuda Insorn)

Analyst

(Mrs. Araya Tippasuk)

Technical Management Team

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

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3. ^{1/} Notification of the National Environment Board No.8 B.E.2537 (1994).

Subject Determining water quality standards in Surface Water Sources for Surface Water Class 5.

4. ^{2/} No standard.

5. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Company Limited , REQUEST SERVICE No. : 2606/67
Branch 2 (Power Plant) SAMPLING METHOD : Grab
SAMPLING BY : SECOT Co., Ltd. SAMPLING TIME : 10:23
SAMPLING DATE : 12/12/2024 ANALYTICAL DATE : 13-20/12/2024
RECEIVED DATE : 13/12/2024 SITE OPERATOR : Mr.Tanachot Changlor
REPORT DATE : 20/12/2024 FILE CODE : 224007_SW_December
SAMPLE CONDITION : Normal
LOCATION DESCRIPTION : 2 = คลองระบายน้ำทิ้งของนิคมฯ หลังจุดปล่อยน้ำของโรงโม่หินสี

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION	STANDARD ^{1/}
				2	
Temperature	°C	2550 B	< 0.5	30.0	2/
pH	-	4500-H ⁺ B	< 0.10	8.16	2/
Total Dissolved Solids	mg/l	2540 C	< 50	698	2/
Total Suspended Solids	mg/l	2540 D	< 5	6	2/
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	2/
Phenols	mg/l	5530 B,C	< 0.001	ND	2/
BOD ₅	mg/l	5210 B	< 1.0	2.7	2/
COD	mg/l	5220 C	< 15.00	< 15.00	2/

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

(Miss Khemchuda Insorn)

Analyst

(Mrs. Araya Tippasuk)

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Subject Determining water quality standards in Surface Water Sources for Surface Water Class 5.

4. ^{2/} No standard.

5. - Not available.

ภาคผนวก ง.5

ใบรับรองผลการตรวจวัดระดับเสียงในพื้นที่ทำงาน

ภาคผนวก จ

ใบแสดงการตรวจเทียบเครื่องมือ



CONTROL UNIT CALIBRATION

(Metric units, mm)

Date 6 Jan 24

Barometric press, Pb

Initial	Final	Average
759	759	759

mmHg

Dry Gas Meter Data

Console No. M50-06

Metering System ID

DGM Number 917415

DGM Model MST-C2-1

Calibrated by : Montri P.

Reference Dry Gas Meter Data

Serial No. 358794

Model S110

Correction factor (Yr) 1.0068

Last Calibration Date 26 Oct 23

Orifice manometer setting, ΔH mm H2O	Ref. DGM Volume V _r , Liters	DGM Volume V _m Liters	Temperature (°C)				Time ⊙ min	DGM Correction factor (Y)	ΔH@ mm
			Ref DGM T _r	Dry Gas Meter					
				Inlet T _i	Outlet T _o	Avg T _m			
12.5	100.2	101.7	25	25	24	24.5	8.87	0.9901	44.4570
25.0	100.1	102.0	25	25	24	24.5	6.52	0.9854	48.0383
50.0	100.3	101.1	25	25	24	24.5	4.72	0.9935	50.1707
76.0	99.3	99.3	25	25	24	24.5	3.70	0.9987	47.9159
100.0	100.1	101.6	25	25	24	24.5	3.70	0.9816	49.8135
150.0	100.2	100.2	25	25	24	24.5	2.67	0.9919	48.1679
Average								0.9902	48.0939

Approved by :



PITOT TUBE CALIBRATION

Calibration Location: SECOT

Calibration Duct No.: CD-0123

Calibration Standard Pitot tube data

Pitot No. : Std-02

Type S Pitot No. : PS20-02

Calibration Date : 09-01-2024

Coefficient (Cp) : 0.99

Calibrated by : Mr. Montri P.

A Side Calibration

Run No.	ΔPstd (mm H ₂ O)	ΔPs (mm H ₂ O)	Cp(s)	Deviation, δ Cp(s) - Cp(A)
1	15.00	21.00	0.8367	-0.0068
2	15.00	20.50	0.8468	0.0034
3	15.00	20.50	0.8468	0.0034

C_{P(A)},avg 0.8435

B Side Calibration

Run No.	ΔPstd (mm H ₂ O)	ΔPs (mm H ₂ O)	Cp(s)	Deviation, δ Cp(s) - Cp(B)
1	15.00	21.00	0.8367	0.0000
2	15.00	21.00	0.8367	0.0000
3	15.00	21.00	0.8367	0.0000

C_{P(B)},avg 0.8367

| CP(A)-CP(B) | = 0.0068

C_{P(Avg)} = 0.8401

Approved by :

*** δ must be ≤ 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 : 09-01-2024

Calibration Duct No.: CD-0123

Calibration Standard Pitot tube data

Pitot No. : Std-02

Coefficient (Cp) : 0.99

Type S Pitot No. : PS10-02

Calibrated by : Mr. Montr P.

A Side Calibration

Run No.	ΔP_{std} (mm H ₂ O)	ΔP_s (mm H ₂ O)	Cp(s)	Deviation, δ Cp(s) - Cp(A)
1	15.00	21.00	0.8367	0.0000
2	15.00	21.00	0.8367	0.0000
3	15.00	21.00	0.8367	0.0000

 $C_{P(A),avg}$ 0.8367

B Side Calibration

Run No.	ΔP_{std} (mm H ₂ O)	ΔP_s (mm H ₂ O)	Cp(s)	Deviation, δ Cp(s) - Cp(B)
1	15.00	21.00	0.8367	0.0000
2	15.00	21.00	0.8367	0.0000
3	15.00	21.00	0.8367	0.0000

 $C_{P(B),avg}$ 0.8367 $|Cp(A) - Cp(B)| = 0.0000$ $C_{P(Avg)} = 0.8367$

Approved by :

*** δ must be ≤ 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 ***

CONTROL UNIT CALIBRATION
(Metric units, mm)

Date 6 Jan 24

Barometric press, Pb

Initial	Final	Average
759	759	759

 mmHg

Dry Gas Meter Data

Console No. M50-09

Serial No. 358794

Metering System ID

Model S110

DGM Number 333249

Correction factor (Yr) 1.0068

DGM Model ES-110

Last Calibration Date 26 Oct 23

Calibrated by : Montr P.

Reference Dry Gas Meter Data

Orifice manometer setting, ΔH mm H2O	Ref. DGM Volume V _r Liters	DGM Volume V _m Liters	Temperature (°C)				Time @ min	DGM Correction factor (Y)	ΔH@ mm
			Ref DGM T _r	Dry Gas Meter					
				Inlet T _i	Outlet T _o	Avg T _m			
12.5	100.3	99.0	25	25	24	24.5	8.53	1.0165	41.1799
25.0	100.0	99.5	25	25	24	24.5	6.08	1.0073	42.0742
50.0	100.1	99.8	25	25	24	24.5	4.47	1.0041	45.2483
76.0	100.4	99.1	25	25	24	24.5	3.55	1.0114	43.2112
100.0	100.1	99.4	25	25	24	24.5	3.55	1.0024	44.6038
150.0	100.1	98.9	25	25	24	24.5	2.57	1.0022	44.8941

Average 1.0073 43.5352

Approved by :



PITOT TUBE CALIBRATION

Calibration Location: SECOT

Calibration Date : 09-01-2024

Calibration Duct No.: CD-0123

Calibration Standard Pitot tube data

Pitot No. : Std-02

Coefficient (Cp) : 0.99

Type S Pitot No. : PS20-01

Calibrated by : Mr. Montri P.

A Side Calibration

Run No.	ΔP_{std} (mm H ₂ O)	ΔP_s (mm H ₂ O)	Cp(s)	Deviation, δ Cp(s) - Cp(A)
1	15.00	21.50	0.8269	-0.0065
2	15.00	21.00	0.8367	0.0033
3	15.00	21.00	0.8367	0.0033

 $C_{P(A),avg}$ 0.8334

B Side Calibration

Run No.	ΔP_{std} (mm H ₂ O)	ΔP_s (mm H ₂ O)	Cp(s)	Deviation, δ Cp(s) - Cp(B)
1	15.00	21.00	0.8367	0.0065
2	15.00	21.50	0.8269	-0.0033
3	15.00	21.50	0.8269	-0.0033

 $C_{P(B),avg}$ 0.8302 $|C_{P(A)} - C_{P(B)}| = 0.0033$ $C_{P(Avg)} = 0.8318$ Approved by : 

*** δ must be ≤ 0.01 for the test to be acceptable ***
 *** $|C_{P(A)} - C_{P(B)}|$ must also be < 0.01 if average of $C_{P(A)}$ and $C_{P(B)}$ is not used ***



TE-5009X TSP/PM10 Calibration Worksheet

Date: 1 Mar 24

Temp (°C): 28

Barometric pressure (mm Hg): 759

Reference Standard Calibration

Equipment: Orifice

Model No: TE-5025A

Serial No: 4218

Manufacturer: Tisch

Unit Under Test

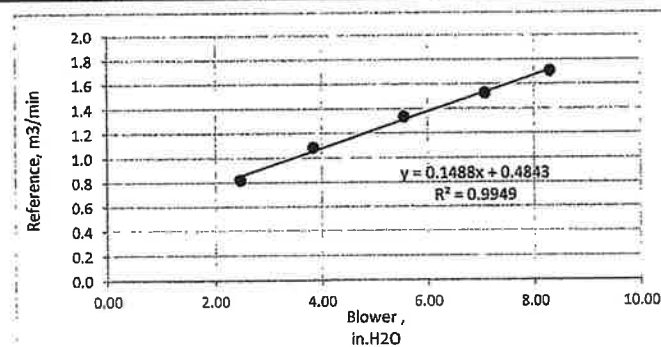
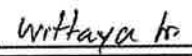
Equipment: High Volume Blower

Model No: TE-5009X

Serial No: BH-006

Calibrated by : Surachart I.

Test No.	Orifice (in.H2O)	Qstd (m3/min)	Blower (in.H2O)	Blower Correct (in.H2O)
1	12.87	1.71	8.35	8.30
2	10.25	1.53	7.11	7.07
3	7.80	1.33	5.59	5.56
4	5.12	1.09	3.87	3.85
5	2.90	0.82	2.49	2.48

Approved by : 



TE-5009X TSP/PM10 Calibration Worksheet

Date:

1 Mar 24

Temp (°C):

28

Barometric pressure (mm Hg):

759

Reference Standard Calibration

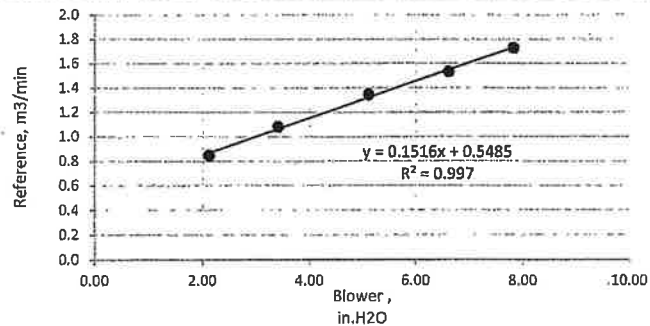
Unit Under Test

Equipment: Orifice
 Model No: TE-5025A
 Serial No: 4218
 Manufacturer: Tisch

Equipment: High Volume Blower
 Model No: TE-5009X
 Serial No: BH-015

Calibrated by : Surachart I.

Test No.	Orifice (in.H2O)	Qstd (m3/min)	Blower (in.H2O)	Blower Correct (in.H2O)
1	13.20	1.73	7.86	7.82
2	10.35	1.53	6.64	6.60
3	7.94	1.35	5.14	5.11
4	5.09	1.08	3.43	3.41
5	3.10	0.85	2.13	2.12



Approved by :

SECOT CO., LTD.

239 Rimklongprapa Rd. Bangsue, Bangkok, 10800, THAILAND

Tel: (662) 9593600 Fax: (662) 9593535

E-Mail: envserv@secot.co.th



TE-5009X TSP/PM10 Calibration Worksheet

Date:

1 Mar 24

Temp (°C):

29

Barometric pressure (mm Hg):

759

Reference Standard Calibration

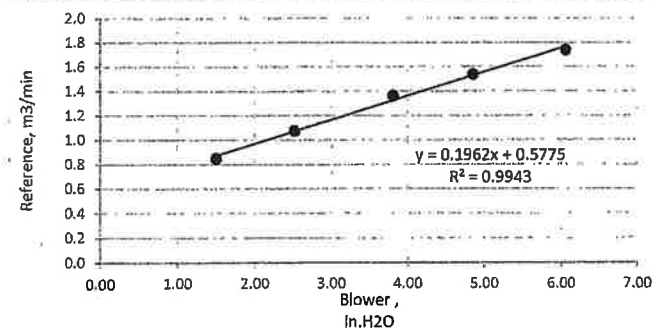
Unit Under Test

Equipment: Orifice
 Model No: TE-5025A
 Serial No: 4218
 Manufacturer: Tisch

Equipment: High Volume Blower
 Model No: TE-5009X
 Serial No: BH-011

Calibrated by : Surachart I.

Test No.	Orifice (in.H2O)	Qstd (m3/min)	Blower (in.H2O)	Blower Correct (in.H2O)
1	13.42	1.74	6.11	6.07
2	10.46	1.54	4.89	4.85
3	8.19	1.36	3.84	3.81
4	5.03	1.07	2.54	2.52
5	3.12	0.85	1.52	1.51



Approved by :

SECOT CO., LTD.

239 Rimklongprapa Rd. Bangsue, Bangkok, 10800, THAILAND

Tel: (662) 9593600 Fax: (662) 9593535

E-Mail: envserv@secot.co.th

Sheet No. : **BH-035-1/2024****TE-5009X TSP/PM10 Calibration Worksheet**

Date:

1 Mar 24

Temp (°C):

33

Barometric pressure (mm Hg):

759**Reference Standard Calibration**

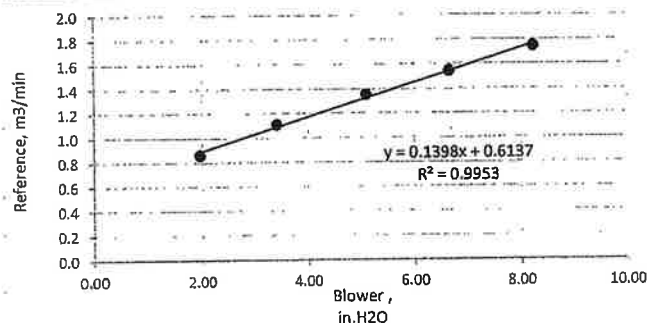
Equipment: **Orifice**
 Model No: **TE-5025A**
 Serial No: **4218**
 Manufacturer: **Tisch**

Unit Under Test

Equipment: **High Volume Blower**
 Model No: **TE-5009X**
 Serial No: **BH-035**

Calibrated by : **Surachart I.**

Test No.	Orifice (in.H2O)	Qstd (m3/min)	Blower (in.H2O)	Blower Correct (in.H2O)
1	13.67	1.75	8.35	8.23
2	10.71	1.55	6.75	6.66
3	8.16	1.35	5.17	5.10
4	5.45	1.11	3.46	3.41
5	3.23	0.86	1.99	1.96



Approved by :

Wittaya In

SECOT CO., LTD.

239 Rimklongpro Rd. Banguek, Bangkok, 10800, THAILAND

Tel: (662) 9593600 Fax: (662) 9593535

E-Mail: envserv@secot.co.th

Airgas.
 an Air Liquide company

 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	50.88 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	13080206	CC401947	4950 PPM CARBON MONOXIDE/NITROGEN	+/- 0.4%	Feb 15, 2018
PRM	12367	APEX1098237	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. This document shall not be reproduced in full without written approval of the issuer.



TESTING CERT No. 3082.05

Approved for Release

Page 1 of 82-401409170-1

Certificate of Calibration

Certificate No. : 67-400100-1

Page : 1 of 2

Submitted by :

Secot Co.,Ltd.

239 RimKlongprapa Road, Bangsue, Bangkok 10800 Thailand

Equipment :

Temperature Indicator with Thermistor Probe (Temp pH)

Temperature Indicator

Manufacturer : Mettler Toledo

Model : Seven2Go S2

Range : N/A

Resolution : 0.1 °C

Serial No. : B924795409

ID No. : PH No.12

Thermistor Probe

Model : InLab Expert Go

Sheath Material : Plastic

Diameter : 10 mm.

Length : 120 mm.

Serial No. : 3051249

ID No. : PH No.12

Environment :

Ambient Temperature : (23 ± 2) °C

Relative Humidity : (50 ± 15) %

Line Voltage : (220 ± 22) VAC

Date of Received :

13 February 2024

Date of Calibration :

20 February 2024

Date of Issue :

20 February 2024

Calibrated by :

Chortip Sanchusri

Calibration Method :

This instrument was calibrated by In-house method comparison technique CAL-M4003

by compared with PRT in the liquid bath at the constant controlled temperature.

The temperature scale used was based on ITS-90

Reference Standard Instruments :

This certification is traceable to the International System of Units

1. Platinum Resistance Thermometer (PRT)

ID No.	Cert. No.	Due Date
400002	TT-0074-22	20 Jun 2024

Traceability

National Institute of Metrology Thailand (NIMT)

2. Standard Digital Thermometer

ID No.	Cert. No.	Due Date
400003	23E1866	01 Jun 2025
400004	23E1866	01 Jun 2025

Traceability

National Institute of Metrology Thailand (NIMT)

National Institute of Metrology Thailand (NIMT)

Approved by :

(Surachai Promthong)

Laboratory Manager

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full except with the prior written approval of the Calibratech Co., Ltd.



Certificate of Calibration

Certificate No. : 67-400100-1

Page : 2 of 2

Result of Calibration :

Without Adjustment

UUC Condition As-Received : Good

Function :

Temperature measurement

Immersion Depth (mm.)	Standard Reading (°C)	UUC Reading (°C)	Correction (°C)	Uncertainty (± °C)
100	25.0020	25.3	-0.3	0.11
100	30.0015	30.3	-0.3	0.11
100	35.0023	35.3	-0.3	0.11

Remark

UUC : Unit Under Calibration

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

This reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor k = 2 ,
providing a level of confidence of approximately 95%

- 000 -




Calibration Certificate

Certificate No.: 2402881-001-01
Client name: SECOT CO., LTD.
Address: 239 Rimklongprapa Road, Bangsue,
Bangsue, Bangkok 10800

Page 1 of 3

Equipment: CHAMBER (Hot Air Oven)
Manufacturer: MEMMERT
Model: UF55
Serial No.: B213.0295
ID No.: N/A
Order No.: 2402881
Operation No.: 2402881-001
Date of Receipt: 24 May 2024
Date of Calibration: 24 May 2024

Calibrated by Mr.Pheraphat Tuanjit
Scientist

Approved by 
(Miss Preeyaporn Jaengkarnkit)
Vice President, Department of Laboratory Services
Responsible for the Technical Management Team

Date of Issue: 30 May 2024

The uncertainties are for a confidence probability of approximately 95 %.

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the National Food Institute.

F-CS-009 Revision: 01 Date: 20-04-65



Calibration Report

Certificate No.: 2402881-001-01
Equipment: CHAMBER (Hot Air Oven)
Model: UF55 Serial No.: B213.0295
Resolution: 0.1 °C ID No.: N/A
Manufacturer: MEMMERT
Date of Calibration: 24 May 2024

Page 2 of 3

Location: Laboratory, SECOT CO., LTD.
Environment Condition: Ambient Temperature (31.0 ± 1) °C
Relative Humidity (68 ± 5) %
Line Voltage (220 ± 3) Volt

Condition of this results of Calibration:

- This instrument was calibrated by insert 9 standard thermometer into its chamber and calibration according to W-TE-014 Based on TLAS G-20-1/02-08 (E): Guidelines for Calibration and Checks of Temperature Controlled Enclosures.
 - The temperature scale used was based on ITS - 90.
 - All data show below were final values and the initial data may be obtained upon request.

2. Reference Standard Instrument :

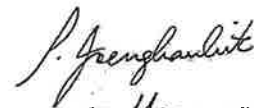
Instrument	Model	Serial No./ID No.	Certificate No.	Due Date	Through
Digital Thermometer with sensor	34972A	MY59003377	TE 670223-01	13 January 2025	NATIONAL FOOD INSTITUTE
	RTD	CH#101-109/ RTD#101-109			

- This certificate is traceable to International System of Units (SI Units).
- This certificate was certified only for the instrument we calibrated.
- This result of calibration was found accurate as shown on date and place of calibration only.
- Condition of Calibrated item : Good

UUC-Description :

Time of Record 1 Hour 9 Minute At 80.0, 104.0 and 180.0 °C
Fresh air Damper - Open Position -
X Close Fan 60%
- Not Available

7. Result of Calibration : ☒ Without adjustment ☐ After adjustment


30 May 2024

F-CS-012 Revision: 01 Date: 20-04-65



Calibration Report

Certificate No.: 2402881-001-01
Equipment: CHAMBER (Hot Air Oven)
Model: UF55 **Serial No.:** B213,0295
Resolution: 0.1 °C **ID No.:** N/A
Manufacturer: MEMMERT

Date of Calibration: 24 May 2024
Calibration point: 80.0, 104.0 and 180.0 °C

Calibration result:

Calibration Condition	Temperature (°C)	Relative Humidity (%)	Line Voltage (Volt)
MIN	30.7	63.6	217.0
MAX	31.4	73.1	223.0

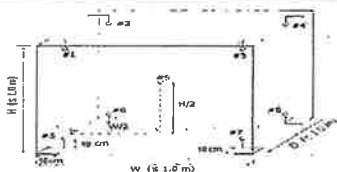


Table1 : Reporting of Temperature

Calibration point (°C)	Measured Temperature (°C) @ Sensor No. (Sensor No.9 is REF)									Uncertainty ± (°C)
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	
80.0	79.99	79.94	80.08	80.08	80.13	79.95	79.90	80.17	80.13	0.46
104.0	103.86	103.80	104.00	103.99	104.10	103.83	103.81	104.18	104.10	0.53
180.0	179.73	179.73	180.01	180.00	180.44	179.81	180.20	180.56	180.25	0.90

Table 2 : Reporting of Characterization Result

UUC* Setting (°C)	UUC* reading (°C)			Stability ± (°C)	Uniformity (°C)	Overall Variation (°C)
	MIN	MAX	Average			
80.0	80.0	80.0	80.0	0.06	0.23	0.37
104.0	104.0	104.0	104.0	0.10	0.30	0.53
180.0	180.0	180.0	180.0	0.10	0.52	0.98

Note The quoted uncertainty include " Stability " and " Loading effect (20% of Temp Uniformity) "

UUC* = Unit Under Calibration

Stability = One-half of the greatest maximum difference of measured temperatures at any one sensors, for at least half an hour after reaching steady state.

Uniformity = The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time.

Overall Variation = The difference of the maximum and minimum measured temperatures throughout observation time.

The report uncertainty of measurement was based on standard uncertainty multiplied by coverage factor k= 2, providing a level of confidence of approximately 95 %.

----- End -----

P. Jongsamrit
30 May 2024



Request Service No. 099/67

Page 1 of 3

Calibration Certificate

Nomenclature : Brand : Mettler Toledo Type : Top-Loading Electronic Balance

Model : AG245 Serial No. : 1117293916 (198129-0)

Submitted by : Laboratory of SECOT CO., LTD.

Location of Calibration : BAL Room , 6th Floor, Secot Co., Ltd.

Calibration range : 0 – 200 g Scale division : 0.00001 g (41g)/ 0.0001 g (210g)

Calibration date : May 24, 2024

Reference Standard No. M2310081S, M2402083S, M2302167S, M2403062N, M2303005N

Traceable to : Metrological Center SCI ECO Services Company Limited.

Thai Calibration Services CO., LTD.

Ambient Condition : Temperature 24.20 – 24.70 °C

Humidity 50.70 – 52.00 % RH

Calibrated By : *Pornnapa Budthum* Approved By : *Narisa Poowasanpetch*

(Miss Pornnapa Budthum)

(Miss Narisa Poowasanpetch)

Testing Officer

Chief of Technical Management

Date : 25/05/2024

Date : 25/05/2024

Issued Date : May 25, 2024

Measurement Report

Request Service No. 099/67

Page 2 of 3

Description : Brand : Mettler Toledo

Type : Top-Loading Electronic Balance

Model : AG245

Serial No. : 1117293916 (198129-0)

Calibration range : 0 – 200 g

Scale division : 0.00001 g (41g)/ 0.0001 g (210g)

Calibration date : May 24,2024

Ambient Condition : Temperature 24.20-24.70 °C Relative humidity 50.70-52.00 % RH

Measurement data :

1. Repeatability of Reading :

Load (g)	Standard Deviation of Reading (g)	Maximum Difference between Successive Reading (g)
50	0.000125	0.0004
100	0.000105	0.0003
150	0.000125	0.0003
200	0.000173	0.0005

2. Off-Center Loading :

A Mass of 50.0000 g was placed and moved to various position on the pan.

Unit : g

Center	Front	Left	Back	Right	Center	Maximum Difference
50.00010	50.00032	50.00048	50.00002	50.00008	50.00020	0.00038

Issued Date : May 25,2024

Request Service No.099/67

Page 3 of 3

3. Departure from Nominal Valve :

Reading (g)	Correction (g)	Uncertainty (+/- g)
0	0.000000	± 0.000034
0.5	0.000022	± 0.000033
1	0.000037	± 0.000018
10	-0.000067	± 0.000036
20	-0.000060	± 0.000044
40	-0.000193	± 0.000072
60	-0.00032	± 0.00011
80	-0.00033	± 0.00013
100	-0.00048	± 0.00015
120	-0.00049	± 0.00017
140	-0.00040	± 0.00022
160	-0.00054	± 0.00023
180	-0.00053	± 0.00024
200	-0.00084	± 0.00027

Calibrated by : *Danapa Mettler*

(Miss Pornnapa Budthum)

Testing Officer

Date : *25/05/2024*

Approved By : *Narisa Poowasanpetch*

(Miss Narisa Poowasanpetch)

Chief of Technical Management

Date : *25/05/2024*

Issued Date : May 25,2024


Calibration Certificate

Certificate No.: 2403705-002-01
Client name: SECOT CO., LTD.
Address: 239 Rimklongprapa Road,
Bangsue, Bangsue, Bangkok 10800

Page 1 of 3

Equipment: Water Bath
Manufacturer: MEMMERT
Model: WB 29
Serial No.: I698.0051
ID No.: N/A
Order No.: 2403705
Operation No.: 2403705-002
Date of Receipt: 18 July 2024
Date of Calibration: 18 July 2024

Calibrated by Mr.Taveesak Seilee
Scientist

Approved by 
(Mr.Pheraphat Tuanjit)
Manager, Division of Calibration Laboratory
Responsible for the Technical Management Team

Date of Issue: 24 July 2024

The uncertainties are for a confidence probability of approximately 95 %.

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the National Food Institute.

F-CS-009 Revision: 01 Date: 20-04-65



Calibration Report

Certificate No.: 2403705-002-01
Equipment: Water Bath
Model: WB 29 Serial No.: I698.0051
Resolution: 0.1 °C ID No.: N/A
Manufacturer: MEMMERT

Date of Calibration: 18 July 2024

Page 2 of 3

Location: Laboratory, SECOT CO., LTD.
Environment Condition:
Ambient Temperature (30 ± 1) °C
Relative Humidity (58 ± 1) %
Line Voltage (221 ± 1) Volt

Condition of this results of Calibration:

- This instrument was calibrated by insert 5 standard thermometer into its liquid bath and calibration according to W-TE-011 based on ASTM E715-80 (2022): Standard Specification for Gravity-Convection and Forced-Circulation Water Baths.
 - The temperature scale used is ITS - 90.
 - All data show below were final values and the initial data may be obtained upon request.

2. Reference Standard Instrument :

Instrument	Model	Serial No./ID No.	Certificate No.	Due Date	Through
Digital Thermometer with sensor	34972A	MY49018263	TE 670368-01	23-Mar-25	NATIONAL FOOD INSTITUTE
	RTD	RTD#201-205 / CH#201-205			

- This certificate is traceable to International System of Units (SI Units).
- This certificate was certified only for the instrument we calibrated.
- This result of calibration was found accurate as shown on date and place of calibration only.
- Condition of Calibrated item : Good

UUC Description:

Time of Record 1 Hour 9 Minute At 95.0 °C

7. Result of Calibration :
- | | |
|-------------------------------------|--------------------|
| <input checked="" type="checkbox"/> | Without adjustment |
| <input type="checkbox"/> | After adjustment |

F-CS-012 Revision: 01 Date: 20-04-65



Calibration Report

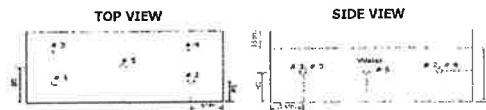
Certificate No.: 2403705-002-01
Equipment: Water Bath
Model: WB 29 Serial No.: I698.0051
Resolution: 0.1 °C ID No.: N/A
Manufacturer: MEMMERT
Date of Calibration: 18 July 2024

Page 3 of 3

Calibration point: 95.0 °C

Calibration result:

Calibration Condition	Temperature (°C)	Relative Humidity (%)	Line Voltage (Volt)
Min	29.9	57	220.3
Max	31.3	59	222.1



Sensor Installation Location

Table 1 : Reporting of Temperature

Calibration Point (°C)	Measured Temperature (°C) @ Sensor No. (Sensor No.5 is REF)					Uncertainty ± (°C)
	# 1	# 2	# 3	# 4	# 5	
95.0	94.93	95.13	94.92	95.09	95.03	0.29

Table 2 : Reporting of Characterization Result

UUC* Setting (°C)	UUC* Reading (°C)			Stability ± (°C)	Uniformity (°C)	Overall Variation (°C)
	MIN	MAX	Average			
95.0	94.9	95.1	95.0	0.19	0.11	0.67

Note The quoted uncertainty include " Stability " and " Loading effect (20% of Temp Uniformity)"
UUC* = Unit Under Calibration
Stability = One-half of the greatest maximum difference of measured temperatures at any one sensors, for at least half an hour after reaching steady state.
Uniformity = The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time.
Overall Variation = The difference of the maximum and minimum measured temperatures throughout observation time.
The report uncertainty of measurement was based on standard uncertainty multiplied by coverage factor k= 2, providing a level of confidence of approximately 95 %.

----- End -----



Calibration Certificate

Certificate No.: 2403705-001-01
Client name: SECOT CO., LTD.
Address: 239 Rimklongprapa Road,
Bangsue, Bangsue, Bangkok 10800

Page 1 of 3

Equipment: CHAMBER (Incubator)

Manufacturer: MEMMERT

Model: ICP 400

Serial No.: K406.0004

ID No.: N/A


Order No.: 2403705

Operation No.: 2403705-001

Date of Receipt: 18 July 2024

Date of Calibration: 18 July 2024

Calibrated by Mr.Taveesak Seilee
Scientist

Approved by 
(Mr.Pheraphat Tuanjit)
Manager, Division of Calibration Laboratory
Responsible for the Technical Management Team

Date of Issue: 24 July 2024

The uncertainties are for a confidence probability of approximately 95 %.

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the National Food Institute.



Calibration Report

Certificate No.: 2403705-001-01
Equipment: CHAMBER (Incubator)
 Model: ICP 400 Serial No.: K406.0004
 Resolution: 0.1 °C ID No.: N/A
 Manufacturer: MEMMERT
Date of Calibration: 18 July 2024

Page 2 of 3

Location: Laboratory, SECOT CO., LTD.
Environment Condition:
 Ambient Temperature (31.0 ± 1) °C
 Relative Humidity (58 ± 1) %
 Line Voltage (221 ± 1) Volt

Condition of this results of Calibration:

- This instrument was calibrated by insert 9 standard thermometer into its chamber and calibration according to W-TE-014 Based on TLAS G-20-1/02-08 (E): Guidelines for Calibration and Checks of Temperature Controlled Enclosures.
 - The temperature scale used was based on ITS - 90.
 - All data show below were final values and the initial data may be obtained upon request.

2. Reference Standard Instrument :

Instrument	Model	Serial No./ID No.	Certificate No.	Due Date	Through
Digital Thermometer with sensor	34972A	MY49018263	TE 670368-01	23 March 2025	NATIONAL FOOD INSTITUTE
	RTD	CH#101-109/ RTD#101-109			

- This certificate is traceable to International System of Units (SI Units).
- This certificate was certified only for the instrument we calibrated.
- This result of calibration was found accurate as shown on date and place of calibration only.
- Condition of Calibrated item : Good

UUC Description :

Time of Record 1 Hour 9 Minute At 20.0 °C
 Fresh air Damper ☐ Open Position ☐
☒ Close Fan ☐
☐ Not Available

7. Result of Calibration : ☒ Without adjustment ☐ After adjustment



Calibration Report

Certificate No.: 2403705-001-01
Equipment: CHAMBER (Incubator)
 Model: ICP 400 Serial No.: K406.0004
 Resolution: 0.1 °C ID No.: N/A
 Manufacturer: MEMMERT
Date of Calibration: 18 July 2024

Page 3 of 3

Calibration point: 20.0 °C

Calibration result:

Calibration Condition	Temperature (°C)	Relative Humidity (%)	Line Voltage (Volt)
MIN	30.0	57	220.3
MAX	32.0	59	222.1

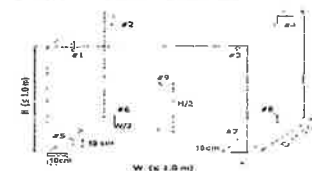


Table1 : Reporting of Temperature

Calibration point (°C)	Measured Temperature (°C) @ Sensor No. (Sensor No.9 is REF)									Uncertainty ± (°C)
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	
20.0	20.10	20.18	20.21	20.26	20.28	20.20	20.21	20.13	20.22	0.27

Table 2 : Reporting of Characterization Result

UUC* Setting (°C)	UUC* Reading (°C)			Stability ± (°C)	Uniformity (°C)	Overall Variation (°C)
	MIN	MAX	Average			
20.0	20.0	20.0	20.0	0.13	0.12	0.40

Note The quoted uncertainty include " Stability " and " Loading effect (20% of Temp Uniformity) "

UUC* = Unit Under Calibration

Stability = One-half of the greatest maximum difference of measured temperatures at any one sensors, for at least half an hour after reaching steady state.

Uniformity = The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time.

Overall Variation = The difference of the maximum and minimum measured temperatures throughout observation time.

The report uncertainty of measurement was based on standard uncertainty multiplied by coverage factor k= 2, providing a level of confidence of approximately 95 %.

----- End -----



Calibration Certificate

Certificate No.: 2402881-002-01
Client name: SECOT CO., LTD.
Address: 239 RimKlongprepa Road, Bangsue,
Bangsue, Bangkok 10800

Page 1 of 3

Equipment: CHAMBER (Hot Air Oven)
Manufacturer: MEMMERT
Model: UM 400
Serial No.: B419.1400
ID No.: N/A
Order No.: 2402881
Operation No.: 2402881-002
Date of Receipt: 24 May 2024
Date of Calibration: 24 May 2024

Calibrated by Mr.Pheraphat Tuanjit
Scientist

Approved by *P. Jaenghanit*
(Miss Preeyaporn Jaengkarnkit)
Vice President, Department of Laboratory Services
Responsible for the Technical Management Team

Date of Issue: 30 May 2024

The uncertainties are for a confidence probability of approximately 95 %.

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the National Food Institute.

F-CS-009 Revision: 01 Date: 20-04-65



Calibration Report

Certificate No.: 2402881-002-01
Equipment: CHAMBER (Hot Air Oven)
Model: UM 400
Resolution: 1 °C
Manufacturer: MEMMERT
Date of Calibration: 24 May 2024
Serial No.: B419.1400
ID No.: N/A

Page 2 of 3

Location: Laboratory, SECOT CO., LTD.
Environment Condition: Ambient Temperature (31.3 ± 1) °C
Relative Humidity (68 ± 5) %
Line Voltage (220 ± 3) Volt

Condition of this results of Calibration:

- This instrument was calibrated by Insert 9 standard thermometer Into its chamber and calibration according to W-TE-014 Based on TIAS G-20-1/02-08 (E): Guidelines for Calibration and Checks of Temperature Controlled Enclosures.
- The temperature scale used was based on ITS - 90.
- All data show below were final values and the initial data may be obtained upon request.
- Reference Standard Instrument :

Instrument	Model	Serial No./ID No.	Certificate No.	Due Date	Through
Digital Thermometer with sensor	34972A	MY59003377	TE 670223-01	13 January 2025	NATIONAL FOOD INSTITUTE
	RTD	CH#201-209/ RTD#201-209			

- This certificate is traceable to International System of Units (SI Units).
- This certificate was certified only for the instrument we calibrated.
- This result of calibration was found accurate as shown on date and place of calibration only.
- Condition of Calibrated item : Good

UUC Description :

Time of Record 1 Hour 9 Minute At 150 °C
Fresh air Damper ☐ Open Position ☐
☒ Close Fan ☐
☐ Not Available

- Result of Calibration : ☒ Without adjustment ☐ After adjustment

P. Jaenghanit
30 May 2024

F-CS-012 Revision: 01 Date: 20-04-65



Calibration Report

Certificate No.: 2402881-002-01
Equipment: CHAMBER (Hot Air Oven)
Model: UM 400 **Serial No.:** B419.1400
Resolution: 1 °C **ID No.:** N/A
Manufacturer: MEMMERT

Date of Calibration: 24 May 2024

Page 3 of 3

Calibration point: 150 °C

Calibration result:

Calibration Condition	Temperature (°C)	Relative Humidity (%)	Line Voltage (Volt)
MIN	31.1	64	217.0
MAX	31.6	73	223.0

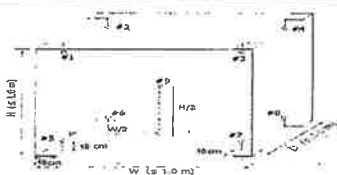


Table 1 : Reporting of Temperature

Calibration point (°C)	Measured Temperature (°C) @ Sensor No. (Sensor No.9 is REF)									Uncertainty ± (°C)
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	
150	150.55	150.90	150.22	150.43	148.88	149.82	149.32	149.81	149.59	1.3

Table 2 : Reporting of Characterization Result

UUC* Setting (°C)	UUC* reading (°C)			Stability ± (°C)	Uniformity (°C)	Overall Variation (°C)
	MIN	MAX	Average			
As Mark 150	176	176	176	0.87	1.31	3.33

Note The quoted uncertainty include " Stability " and " Loading effect (20% of Temp Uniformity) "

UUC* = Unit Under Calibration

Stability = One-half of the greatest maximum difference of measured temperatures at any one sensors, for at least half an hour after reaching steady state.

Uniformity = The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time.

Overall Variation = The difference of the maximum and minimum measured temperatures throughout observation time.

The report uncertainty of measurement was based on standard uncertainty multiplied by coverage factor $k=2$, providing a level of confidence of approximately 95 %.

----- End -----

P. Jiraphan
30 May 2024



Bangkok High Lab Co.,Ltd.
4/176 Soi Ladplakao 66, Ladplakao Rd., Anusawari, Bangkok, Bangkok 10220
Tel: (662) 971-5800 Fax: (662) 971-5300
Website: www.bangkokhighlab.com E-mail: info@bangkokhighlab.com



CERTIFICATE OF CALIBRATION

Certificate No : S2024/033

Page : 1/5

Order No : 010/2024

Customer : SECOT COMPANY LIMITED
Address : 239 Rimklongprapa Road, Bangsue, Bangkok 10800, Thailand
Instrument : UV/VIS spectrophotometer
Manufacture : Thermo Scientific
Model : Genesys 150 UV-VIS
Serial Number : 9A5Y332022
Environment : Temperature (25.1 - 24.8) °C
Humidity (52 - 55) %RH
Received Date : February 20, 2024
Calibration Date : February 20, 2024
Issued Date : February 22, 2024
Calibrate Status : No Adjustment
Calibration Area : Customer area
Roomname : Laboratory Room of SECOT COMPANY LIMITED

Calibrated By : *Pacharapol*
(Mr. Pacharapol Kwanbang)
Calibration Engineer

Approved By : *Teerasak Auiphat*
(Mr. Teerasak Auiphat)
Authorized signatory

This calibration certificate shall not be reproduced other than in full except with the prior written approval of the Bangkok High Lab Co.,Ltd.



Certificate No : S2024/033
Page : 2/5

1. Photometric Accuracy

CRMs: Neutral Density Glass Filters

CRMs Serial Number: 10563

Traceability: Traceable to NIST, U.S.A. through Neutral density filters NIST SRM 930e & 1930, Double Aperture method through Starra certificate report no.113594

Spectral slit width : 2.00 nm

1.1 Reading scale at 420.0 nm

Filter STDs (Abs) Certificate	Average Measured Value (A)	Correction (A)	Uncertainty ± (A)
0.0000	0.000	0.0000	0.0028
0.5604	0.559	0.0014	0.0044
1.0723	1.073	-0.0007	0.0038
2.1753	2.179	-0.0037	0.0064

1.2 Reading scale at 440.0 nm

Filter STDs (Abs) Certificate	Average Measured Value (A)	Correction (A)	Uncertainty ± (A)
0.0000	0.000	0.0000	0.0028
0.5503	0.548	0.0023	0.0040
1.0467	1.047	-0.0003	0.0040
2.1117	2.114	-0.0023	0.0064

1.3 Reading scale at 465.0 nm

Filter STDs (Abs) Certificate	Average Measured Value (A)	Correction (A)	Uncertainty ± (A)
0.0000	0.000	0.0000	0.0028
0.4996	0.498	0.0016	0.0034
0.9649	0.963	0.0019	0.0040
1.9646	1.966	-0.0014	0.0060

1.4 Reading scale at 546.1 nm

Filter STDs (Abs) Certificate	Average Measured Value (A)	Correction (A)	Uncertainty ± (A)
0.0000	0.000	0.0000	0.0028
0.5136	0.511	0.0026	0.0028
0.9765	0.976	0.0005	0.0028
1.9848	1.984	0.0008	0.0064



Certificate No : S2024/033
Page : 3/5

1.5 Reading scale at 590.0 nm

Filter STDs (Abs) Certificate	Average Measured Value (A)	Correction (A)	Uncertainty ± (A)
0.0000	0.000	0.0000	0.0028
0.5424	0.540	0.0024	0.0029
1.0130	1.011	0.0020	0.0029
2.0238	2.021	0.0028	0.0061

1.6 Reading scale at 635.0 nm

Filter STDs (Abs) Certificate	Average Measured Value (A)	Correction (A)	Uncertainty ± (A)
0.0000	0.000	0.0000	0.0028
0.5265	0.524	0.0025	0.0030
0.9667	0.963	0.0037	0.0031
1.9145	1.910	0.0045	0.0062

2. Photometric Accuracy

CRMs: Potassium Dichromate in Perchloric acid

Blank Serial Number: 110516

CRMs Serial Number: 109966

Traceability: Traceable to NIST, U.S.A. through crystalline potassium dichromate NIST SRM 935a through Starra certificate report no.113596

Spectral slit width : 2.00 nm

Wavelength (nm)	Certificate (Abs)	Average Measured Value (A)	Correction (A)	Uncertainty ± (A)
235	0.0000	0.000	0.0000	0.0050
	0.7428	0.738	0.0048	0.0056
257	0.0000	0.000	0.0000	0.0050
	0.8605	0.856	0.0045	0.0055
313	0.0000	0.000	0.0000	0.0050
	0.2885	0.288	0.0005	0.0054
350	0.0000	0.000	0.0000	0.0050
	0.6376	0.635	0.0026	0.0056



Certificate No : S2024/033
Page : 4/5

3. Wavelength Accuracy

Spectral slit width : 2.00 nm

3.1 CRMs: Holmium Glass Filter

CRMs Serial Number: 10763

Traceability: Traceable to NIST Holmium oxide filter NIST SRM 2034, through Starna certificate report no. 113607

Filter STDs (nm) Certificate	Average Measured Value (nm)	Correction (nm)	Uncertainty ± (nm)
241.74	241.301	0.439	0.12
279.44	279.243	0.197	0.12
287.98	287.555	0.425	0.12
334.10	333.778	0.322	0.12
361.00	360.913	0.087	0.12
418.01	418.457	0.153	0.12
459.63	453.543	0.087	0.12
460.05	459.911	0.139	0.12
536.66	536.327	0.333	0.12
637.99	637.449	0.531	0.12

3.2 CRMs: Didymium Glass Filter

CRMs Serial Number: 10764

Traceability: Traceable to NIST Didymium filter NIST SRM 2034, through Starna certificate report no. 113608

Filter STDs (nm) Certificate	Average Measured Value (nm)	Correction (nm)	Uncertainty ± (nm)
585.29	584.949	0.341	0.12
684.49	683.901	0.589	0.12
740.18	739.646	0.534	0.12
748.48	747.844	0.636	0.12
807.03	806.832	0.198	0.12
879.27	878.923	0.347	0.12



Certificate No : S2024/033
Page : 5/5

4. *Stray Light

CRMs: Potassium Chloride aqueous solution

CRMs Serial Number: 14912

Blank Serial Number: 14958

Traceability: Traceable to NIST, U.S.A. potassium chloride NIST SRM2032, through Starna certificate report no. 113597

Spectral slit width : 2.00 nm

Wavelength (nm)	Certificate	Average Measured
201.13	>2A	2.0170
201.13	<1%T	0.9818

5. *Spectral Resolution

CRMs: Toluene in Hexane

CRMs Serial Number: 14812

Blank Serial Number: 14803

Traceability: Traceable to toluene in hexane NIST SRM2034, through Starna certificate report no. 113598

Spectral slit width (nm)	Abs Ratio
0.5	#N/A
1.0	#N/A
1.5	#N/A
2.0	1.401
3.0	#N/A

Note : * "Not TISI Accredited" in this certificate have been included for completeness

Remark: 1. Calibrate Method

- 1.1 Photometric and Wavelength accuracy: In-house method W-SER-001 based on ASTM E925-02 and ASTM E275-01
- 1.2 Stray light: Measuring the CRMs in both absorbance and transmittance unit at wavelength 201.23 nm. Base on European Pharmacopoeia V.6.19.3 1984
- 1.3 Spectral resolution: Measuring the CRMs. The maximum absorbance values were read at closest to 268.7nm and the minimum absorbance values were read at closest 267.0 nm. Refer to European Pharmacopoeia V.6.19.3 1984
2. N/A = not available.
3. Uncertainty of Measurement: The reported uncertainty of measurement was based on standard uncertainty multiplied by a coverage factor $k = 2$, providing a level of confidence of approximately 95%.
4. This result of calibration was found accurate as shown on date and place of calibration only.
5. This report will certify of calibrated equipment only.


- End of Report -



PinAAcle 900T Preventive Maintenance Report

Company Name: Secot.co.th.
Instrument Location: Instrument room.
239 Rimkhlong Prapa Road, Bang Sue, Bangkok 10800
Instrument Serial No.: PTDS23051001
Date: 27-Mar-2024

PinAAcle 900T Preventive Maintenance (PM)			
Company Name:	Secot.co.th.		
Address (Instrument Location):	239 Rimkhlong Prapa Road, Bang Sue, Bangkok 10800		
Serial Number:	PTDS23051001	PM Number:	1 OF 2 W
Customer Name (if applicable):	K.Araya	Telephone Number:	0-2910-5021-6
Customer Support Engineer Name:	K.Piyawit	Service Order Number:	WO-02706368
Date PM Performed: (DD-MMM-YYYY)	27-Mar-2024	Next PM Due Date: (DD-MMM-YYYY)	27-Sep-2024
Standard Labor Hours to Complete PM:		5 hours	

Part Number	Release	Publication Date	
09370143 Rev.9	A	January 2018	

Scope

The purpose of this PM is to ensure the continued functionality of the PinAAcle 900T by inspecting and replacing any worn or damaged parts. This service should only be performed by a trained representative of PerkinElmer.

The customer should save their method before the PM begins.

General Instructions:

The customer must provide the engineer operational data to demonstrate recent instrument performance prior to starting the PM. Always check with the customer before making any changes that may affect the customer's analysis or calibration, including a current back-up of system software and/or data files. The completed document should be signed by an authorized PerkinElmer and customer representative and left with the customer. Update the PM sticker and instrument logbook as required.

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Component List

Component / Specific Model	Serial #	Configuration Notes
PinAAcle 900T	PTDS23051001	Synglstrx v.5.10

Parts Lists

Parts Included with the PM		
Part Number (if applicable)	Description	Quantity
B0501696	Fan Filters	N/A
B3002013	THGA Contact Cylinders	N/A
B3141064	Glycerol for THGA Cooling	N/A
N3160156	O-Ring Kits for Sampling Introduction (Stainless Steels Nebulizer)	N/A
N3160157	O-Ring Kits for Sampling Introduction (Plastic Nebulizer)	N/A
N9301714	Replacement Acetylene Filter Cartridge	N/A
TH001022	Replacement Air Filter Cartridge	N/A

Additional Reagents and Standards Required for PM				
Part Number (if applicable)	Description	Quality	Batch/Lot #	Expired Date (MM/YY)
N9300183	1000 mg/L Copper Standard	AR	27-39CRY1	30-Apr-2025
N9300244	GFAAS Mixed Standard	AR	60-004CRY1	28-Feb-2025

Additional Reagents and Standards Required for PM (Customer Support Solution)				
Part Number (if applicable)	Description	Quantity	Batch/Lot #	Expiration Date (MM/YY)
N/A	DI Water	250 mL	AR	AR
N/A	0.5% HNO ₃	250 mL	AR	AR

Additional Tools Required for PM			
Part Number (if applicable)	Description	Quantity	Serial #
N1013000	0.2A Neutral density filter	1	MGO-056
N1013002	1.0A Neutral density filter	1	MG2-258
B3100652 Or N9307029	Electronic Flow Meter	1	MY2231FC07
B0505495	Test Jig	1	N/A
03030997	System 2 EDL Driver	1	03030997
N3050605	As System 2 EDL	1	16148
N3050121	Cu Lumina HCL	1	092216-010130
N3050109	Ba Lumina HCL	1	102416-040160
N3050139	K Lumina HCL	1	110716-010060
N3050152	Ni Lumina HCL	1	100516-030190
N3050119	Cr Lumina HCL	1	030621-020190

Procedure Checklist

Use (✓) to check off those steps in the checklist that have been completed.

1. General:

- ☒ Review the instrument performance with the customer and document any recent problems.
- ☒ Inspect the customer log book and make any appropriate PM entries.
- ☒ Perform general inspection of system for cleanliness.

2. PC Instrument Software:

- ☒ Instrument Software user files/databases archived, packed, and/or deleted as needed.

3. Mechanical:

- ☒ Inspect and clean all fans and filters. Replace filters if necessary
- ☒ Inspect all gas and water lines for leaks and/or wear. Replace if needed. Thoroughly inspect all quick connects. Replace the Y connector, P/N 09921079, if needed.
- ☒ Clean exterior of the instrument.

3.1 Flame Technique

- ☒ Inspect the burner head, burner chamber, and nebulizer. Clean if needed as stated in the Hardware Guide.
- ☒ Check burner head dimensions with the feeler gauge as stated in the Hardware Guide in the Maintenance chapter section on cleaning the burner head and checking slot width. Replace if out of specification
- ☒ Check the condition of the end cap, burner head, and nebulizer O-rings. Replace if necessary.
- ☒ Check the drain system for signs of wear. Replace worn or damaged parts.
- ☒ Visually check for proper flame conditions when igniting the Air-C₂H₂ and N₂O-C₂H₂ flames (if applicable).

3.2 THGA Technique

- ☒ Inspect the pole pieces and clean where the pole pieces contact the furnace. Replace the pole piece p-rings as needed, P/N's B0501018 & B0501250. Grease the O-rings as needed with Apiezon L grease, P/N 09905148
- ☒ Inspect the four insulation pads on the front contact housing of the THGA in furnace. If the pads are missing replace the THGA furnace or replace the insulator pads on the furnace.
- ☒ Inspect the graphite tube and clean the contact cylinders. Replace if necessary.
- ☒ Check internal and external gas flows with the Electronic Gas Flow Meter and the Gas Flow Test Probe as described in the Service Manual. Correct if necessary.
- ☒ Check furnace open/close function.
- ☒ Verify the operation of the GFTV Camera for proper operation and viewing alignment in the furnace camera Tube View window. Align if needed.
- ☒ Check the operation of the Halogen Light ASSY for the GFTV Camera. Replace if needed.
- ☒ Check the water level/quality in the recirculation (if applicable). Add distilled water if necessary.
- ☒ Check the cooling system fluid flow rate with the FCS In-Line Flow Meter for proper levels if needed. Refer to SDB# COSY008.STN

- ☒ Perform Cooling System maintenance if needed per SDB# COSY005.STN.
- ☒ Check auto sampler operation.
- ☒ Perform an auto sampler check valve test as described in the Service Manual.
- ☒ Lubricate the spindles of the auto sampler pumps and all moving parts of the tray mechanics as described in the Service Manual.
- ☒ Inspect the auto sampler sampling capillary as described in the Service Manual. Replace if necessary.

4. Electrical:

- ☒ Inspect PC boards. Clean if necessary.
- ☒ Carefully check all internal and external cable connections.
- ☒ Check instrument firmware revisions upgrade to current levels (if necessary)
- ☒ Run Diagnostics Test within the Advanced function of the Spectrometer page. Check the results in the service log folder in the Spectrometer BM Log Viewer.

5. Optics:

- ☒ Inspect and clean the sample compartment windows, if needed.
- ☒ Inspect and clean the furnace windows, if needed.
- ☒ Inspect and clean the GFTV camera lens, if needed.
- ☒ Inspect optics. Clean or replace if necessary,

6. Gasses:

- ☒ Verify that the Gasses supplied to the instrument are within the pressure and purity specifications found in the PinAAcle 900 Series Pre-installation Checklist SDB.
- ☒ Verify that the air filter element is dry. Replace if necessary.

7. Flame Interlock Check:

Description: Check to ensure that all safety interlocks are closed.

Parameter	Specification	Test Results	Pass/Fail
Flame Sensor	Air/C ₂ H ₂ Flame correctly shuts down	Active	Passed
Drain Sensor	Air/C ₂ H ₂ Flame correctly shuts down	Active	Passed
Nebulizer Sensor	Air/C ₂ H ₂ Flame correctly shuts down	Active	Passed
C ₂ H ₂ Pressure Sensor	Air/C ₂ H ₂ Flame correctly shuts down	Active	Passed
Air Pressure Sensor	Air/C ₂ H ₂ Flame correctly shuts down	Active	Passed
Burner Head Sensor	Choosing Nitrous Oxide as the oxidant should trigger an interlock shuts down	Active	Passed

8. After PM Performance tests [Flame]:

8.1 Detector Linearity with Barium

Description: Ensures that the detector is linear in the Visible Range.

Parameter	Specification	Certificate Value at 553.6 nm (Abs.)	Test Results	Pass/Fail
1.0 A ND Filter	± 5% from Cert.	1.0154	0.9921	Passed
0.2 A ND Filter	± 5% from Cert.	0.1806	0.2037	Passed

8.2 Baseline Noise at 1.0 Absorbance with Barium

Description: Ensures that a high absorbance will not produce excessive noise.

Parameter	Specification	Results	Pass/Fail
Standard Deviation	≤ 0.010	0.0031	Passed

8.3 AA Baseline Noise with Copper

Description: Check baseline noise.

Parameter	Specification	Results	Pass/Fail
Standard Deviation	≤ 0.001	0.0005	Passed

8.4 D₂ Background Compensation with Copper

Description: Verifies the instruments ability to compensate for Background absorption.

Parameter	Specification	Results	Pass/Fail
Standard Deviation	≤ 0.010	0.0004	Passed

8.5 AA-BG Baseline Noise with Copper

Description: Ensures that background correction does not produce excessive noise.

Parameter	Specification	Results	Pass/Fail
Standard Deviation	≤ 0.005	0.0001	Passed

8.6 AA-BG Baseline Noise with Arsenic

Description: Ensures that background correction does not produce excessive noise at a low wavelength.

Parameter	Specification	Results	Pass/Fail
Standard Deviation	≤ 0.005	0.0004	Not Applicable

8.7 Flame Sensitivity

Description: Instrument Sensitivity checked against Copper standard.

Standard Copper Sensitivity	Specification	Results (Abs.)	Pass/Fail
5 mg/L Sensitivity SS Neb (If applicable)	≤ 0.250 Abs.	N/A	Not Applicable
2 mg/L Sensitivity HS Neb (If applicable)	≤ 0.250 Abs.	0.3541	Passed

9. After PM Performance tests [THGA]:

9.1 Furnace Gas Flows

Description: Ensures the flow rates are within specification.

Parameter	Specification	Test Results	Pass/Fail
Internal Flow Rate	250 mL/min ± 25 mL/min	250	Passed
External Flow Rate	100 mL/min ± 10 mL/min	99	Passed

9.2 Chromium Baseline Noise

Description: Signal to noise check.

Parameter	Specification	Results	Pass/Fail
Baseline Noise	≤ 0.005 Abs.	0.0004	Passed
Standard Deviation	≤ 0.005	0.0001	Passed

9.3 Chromium Characteristic Mass and Precision

Description: Calculate the characteristic mass using the characteristic mass tool and precision from the integrated absorbance values.

Parameter	Specification	Results	Pass/Fail
Cr m.s. Results	≤ 7.0 ng/0.0044 A.s	4.90	Passed
Precision	≤ 20%	0.82	Passed

9.4 Copper Characteristic Mass and Zeeman Ratio

Description: Calculate the characteristic mass using the characteristic mass tool and check the Zeeman Ratio.

Parameter	Specification	Results	Pass/Fail
Cu mg Result	$\leq 16.5 \text{ pg}/0.0044 \text{ A-S}$	14.20	Passed
Zeeman Ratio	0.52 ^{min} 0.04	0.5430	Passed



10. Review:

- ☒ Review with the customer PM work performed.
- ☒ Review with the customer routine maintenance procedures.
- ☒ Discuss recommended customer supplied materials to have on hand.
- ☒ Attach PM sticker.

Additional Comments

Additional Comments Regarding the PM	
Zeeman Ratio	$= \frac{\text{Atomic Signal (Peak area)}}{\text{Atomic Signal (Peak area)} + \text{Background Signal (Peak area)}}$ $= \frac{0.1545}{0.1545 + 0.1300}$ $= 0.5430$

Review

The preventive maintenance checks and if applicable performance tests for PinAAcle 900T have been completed.	
This PinAAcle 900T Passes <input type="checkbox"/> Fails <input type="checkbox"/> the preventive maintenance.	
Review of Preventive Maintenance:	
Authorized PerkinElmer Representative: 	Date: 27-Mar-2024 (DD-MMM-YYYY)
Authorized Customer Representative: 	Date: 27-Mar-2024 (DD-MMM-YYYY)



SOUND LEVEL METER CALIBRATION

Calibration Location: SECOT

Calibration Date: Aug 27, 24

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
15	Cirrus	CR162B	G300769	93.7	0.0

Calibrated by :

Approved by :

Preeda S.



SOUND LEVEL METER CALIBRATION

Calibration Location: SECOT

Calibration Date: Aug 30, 24

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
18	Cirrus	CR162B	G300892	93.7	0.0

Calibrated by :

Approved by :

Preeda S.



SOUND LEVEL METER CALIBRATION

Calibration Location: SECOT

Calibration Date: Aug 16, 24

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
6	SCARLET	ST-21D	820727	94.0	-0.2
7	SCARLET	ST-21D	820728	94.0	-0.2

Calibrated by :

Approved by :



SOUND LEVEL METER CALIBRATION

Calibration Location: SECOT

Calibration Date: Nov 14, 24

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
6	SCARLET	ST-21D	820727	93.8	0.0
7	SCARLET	ST-21D	820728	93.8	0.0

Calibrated by :

Approved by :



ELECTRICAL AND ELECTRONICS INSTITUTE
FOUNDATION FOR INDUSTRIAL DEVELOPMENT

975 Moo 4, Bangpoo Industrial Estate, Soi 8, Sukhumvit Road km 37,

Phraek Sa, Mueang Samut Prakan, Samut Prakan 10280

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



Certificate No.: CP20240083EA

Operation No.: CP2024020056

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: 8 February 2024

Calibrated Date: 14 February 2024

Issued Date: 20 February 2024

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.



ELECTRICAL AND ELECTRONICS INSTITUTE
FOUNDATION FOR INDUSTRIAL DEVELOPMENT

Certificate No.: CP20240083EA

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-1006-23	7 June 2024
2) Waveform Generator	33511B	MY52302264	CK20230039EA	27 June 2024
3) Audio Analyzing DMM	2015-P	4079144	E1U231797	23 April 2024
4) Pressure humidity and Temperature Transmitter	PTU301	F0640002	CL1-P230024 CD20230196EA	20 March 2024 23 July 2024

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; NSQ Accredited Calibration No.0119

Result of Calibration:-

1. Function : Sound pressure level

Normal	Specified Sound	Measured value	Deviated value ^[1]	Acceptance limit ^[3]
Frequency (Hz)	Pressure level (dB)	(dB)	(dB)	(dB)
1000	94	93.89	-0.11	±0.25

2. Function : Frequency

Normal Sound	Specified Frequency	Measured value	Deviated value ^[2]	Acceptance limit ^[3]
Pressure level (dB)	(Hz)	(Hz)	(%)	(%)
94	1000	1000.34	0.03	±0.70

Certificate No.: CP20240083EA

Calibration Report

3. Function : Total distortion + noise

Normal Sound Pressure level (dB)	Normal Frequency (Hz)	Measured value ^[4] (%)	Acceptance limit ^[5] (%)
94	1000	0.68	2.50

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. Maximum-permitted uncertainty of measurement was IEC 60942:2017 Class 1.
 - 3. The coverage factor $k = 2.00$

-- End of Report --

ภาคผนวก ก

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 ซีคอฟ 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 ซีคอฟ จำกัด ขอต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ว-๒๓๙ สถานที่ ตั้งเลขที่ ๒๓๙ ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพมหานคร ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท ซีคอฟ จำกัด ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

- ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๑๐ ราย ตามสิ่งที่ส่งมาด้วย ๑
ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๓๘ ราย ตามสิ่งที่ส่งมาด้วย ๒
ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย น้ำใต้ดิน อากาศเสีย สิ่งปฏิกูล หรือวัสดุที่ไม่ใช่แล้ว และดิน ตามสิ่งที่ส่งมาด้วย ๓

หนังสือฉบับนี้จะหมดอายุในวันที่ ๒ พฤษภาคม ๒๕๖๙ หากประสงค์จะต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อกรมโรงงานอุตสาหกรรมภายใน ๓๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ซึ่งคำขอต่ออายุดังกล่าวขอรับได้ที่กรมโรงงานอุตสาหกรรม ทั้งนี้ สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ ที่หน้าเว็บไซต์กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายประสม ดำรงพงษ์)

กองวิจัยและเตือนภัยมลพิษโรงงาน

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน
ปฏิบัติการควบคุมและเตือนภัยโรงงานอุตสาหกรรม

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๔๙

ไปรษณีย์อิเล็กทรอนิกส์ saraban@diw.mail.go.th



“อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว”



เอกสารแนบท้ายหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท ซีคอฟ จำกัด

เลขทะเบียน ว-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) นางอารยา ทิพรัักษ์
๔) นางสาวเชมชุดา อินทร์ศรี
๕) นางสาวปรีดา สมใจ
๖) นางสาวอรัญญา มาตา
๗) นางสาวลดาวัลย์ วงศ์เจริญ
๘) นางสาวณัฏฐพร เกตวันดี
๙) นางสาวนริสา ภูวสรเพ็ชญ์
๑๐) นางสาวศิริวรรณ นิยมสง่า

- ทะเบียนเลขที่ ว-๒๓๙-ค-๐๐๐๒
ทะเบียนเลขที่ ว-๒๓๙-ค-๐๐๐๓
ทะเบียนเลขที่ ว-๒๓๙-ค-๐๐๐๔
ทะเบียนเลขที่ ว-๒๓๙-ค-๐๐๐๕
ทะเบียนเลขที่ ว-๒๓๙-ค-๐๐๐๖
ทะเบียนเลขที่ ว-๒๓๙-ค-๐๐๐๗
ทะเบียนเลขที่ ว-๒๓๙-ค-๐๐๐๘
ทะเบียนเลขที่ ว-๒๓๙-ค-๐๐๐๙
ทะเบียนเลขที่ ว-๒๓๙-ค-๐๐๑๐
ทะเบียนเลขที่ ว-๒๓๙-ค-๐๐๑๑

วิมล

- ๑) นางสาวสุดาพร สุนทร
- ๒) นางสาวสุชาทิพย์ เทียนเดีย
- ๓) นางสาวสุนันทา ศิริพัฒนานานท์
- ๔) นายบวร ดีชัยยะ
- ๕) นางสาวเกศรินทร์ วรเดชวิทยา
- ๖) นายอนันต์พนั พิมวันนา
- ๗) นายชิตพล สมประสงค์
- ๘) นางสาวศศิธร พรหมประเสริฐ
- ๙) นายศิวนนท์ กุลวงษ์
- ๑๐) นางสาวอริษา คนิวานนท์
- ๑๑) นางสาวสิริวรรณ แก้วจึงดวง
- ๑๒) นางสาวปิ่นวรรณ สุวรรณวิโรจน์
- ๑๓) นางสาวกนิษฐา เจริญเชื้อ
- ๑๔) นายวัชรกานต์ ประมาคะเต
- ๑๕) นายซอง เสงฆ์วัลกุล
- ๑๖) นางสาวกฤษณา จันทุม
- ๑๗) นางสาวพรนภา บุตรธรรม
- ๑๘) นางสาวอารีย์ อาจปลิว
- ๑๙) นายธนโชติ ช่างลื้อ
- ๒๐) นางสาวพัชรา สมานฉันท
- ๒๑) นางสาวจุฑารัตน์ แจ่มเรือน
- ๒๒) นางสาวกนิษฐา กุ้ยอ่อน
- ๒๓) นายกิตติพงศ์ เกษณีสุข
- ๒๔) นายจิรวัฒน์ โคตรคำหาญ
- ๒๕) นายชนะพล อัครพล
- ๒๖) นางสาวทิพย์สุดา วรรณการ
- ๒๗) นายสิทธิชัย สว่างวงศ์ไชย
- ๒๘) นายพิษณุ สีนามเพ็ง
- ๒๙) นายรัตนชัย ขอบท่ากิจ
- ๓๐) นายธนาวุฒิ ถ้วนแสง
- ๓๑) นายณัฐชัย ไชยโคตร
- ๓๒) นายณัฐดนัย กฤษณะโสม
- ๓๓) นายศุภชัย สุขใหม่
- ๓๔) นายรอมกoon เหลี่ยมพามา
- ๓๕) นางสาวสุภาวดี บัวแก้ว
- ๓๖) นางสาวมารียาม์ ฮาแว
- ๓๗) นางสาววิระยา ปัจฉิมบุรณ์
- ๓๘) นางสาวศลิษา อินริย์

[illegible]

น้ำเสีย จำนวน 45 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
2	Arsenic	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[4] 2) Digestion, Inductively Coupled Plasma Method ^[4]
3	Barium	1) Digestion, Direct Nitrous Oxide-Acetylene Flame Method ^[4] 2) Digestion, Inductively Coupled Plasma Method ^[4]
4	α -BHC	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
5	β -BHC	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
6	δ -BHC	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
7	γ -BHC	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
8	Biochemical Oxygen Demand	1) 5-Day BOD Test, Azide Modification Method ^[4] 2) 5-Day BOD Test, Membrane Electrode Method ^[4]
9	Cadmium	1) Digestion, Direct Air-Acetylene Flame Method ^[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ^[4] 3) Digestion, Inductively Coupled Plasma Method ^[4]
10	Chemical Oxygen Demand	1) Open Reflux, Titrimetric method ^[4] 2) Closed Reflux, Colorimetric method ^[4] 3) Closed Reflux, Titrimetric Method ^[4]
11	Chlordane	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
12	Chromium	1) Digestion, Direct Air-Acetylene Flame Method ^[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ^[4] 3) Digestion, Inductively Coupled Plasma Method ^[4]
13	Color	ADMI Weighted-Ordinate Spectrophotometric Method ^[4]
14	Copper	1) Digestion, Direct Air-Acetylene Flame Method ^[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ^[4] 3) Digestion, Inductively Coupled Plasma Method ^[4]
15	Cyanide	Distillation, Colorimetric method ^[4]
16	4,4'-DDD	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
17	4,4'-DDE	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
18	4,4'-DDT	2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4] 1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
19	Dieldrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
20	Endosulfan I	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
21	Endosulfan II	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
22	Endosulfan Sulfate	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
23	Endrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
24	Endrin Aldehyde	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
25	Formaldehyde	Distillation, Colorimetric Method ^[3]
26	Free Chlorine	1) Iodometric Method ^[4] 2) DPD Colorimetric Method ^[4]
27	Heptachlor	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass-Spectrometric Method ^[4]
28	Heptachlor epoxide	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
29	Hexavalent Chromium	1) Colorimetric Method ^[4] 2) Extraction, Air-Acetylene Flame Method ^[4]
30	Lead	1) Digestion, Direct Air-Acetylene Flame Method ^[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ^[4] 3) Digestion, Inductively Coupled Plasma Method ^[4]
31	Manganese	1) Digestion, Direct Air-Acetylene Flame Method ^[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ^[4] 3) Digestion, Inductively Coupled Plasma Method ^[4]
32	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[4]
33	Methoxychlor	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
34	Nickel	1) Digestion, Direct Air-Acetylene Flame Method ^[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ^[4] <i>3) Digestion...</i>

3) Digestion...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
		3) Digestion, Inductively Coupled Plasma Method ^[4]
35	Oil & Grease	1) Liquid-Liquid, Partition-Gravimetric Method ^[4] 2) Soxhlet Extraction Method ^[4]
36	pH	Electrometric Method ^[4]
37	Phenols	1) Distillation, Chloroform Extraction Method ^[4] 2) Distillation, Direct Photometric Method ^[4]
38	Selenium	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[4] 2) Digestion, Inductively Coupled Plasma Method ^[4]
39	Sulfide	1) Iodometric method ^[4] 2) Methylene blue method ^[4]
40	Temperature	Laboratory and Field Methods ^[4]
41	Total Dissolved Solids	Dried at 180 °C ^[4]
42	Total Kjeldahl Nitrogen	1) Macro Kjeldahl Method ^[4] 2) Semi-Micro Kjeldahl Method ^[4]
43	Total Suspended Solids	Dried at 103-105 °C ^[4]
44	Trivalent Chromium	1) Digestion, Direct Air-Acetylene Flame Method; Colorimetric Method; Calculation ^[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method; Colorimetric Method; Calculation ^[4] 3) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation ^[4]
45	Zinc	1) Digestion, Direct Air-Acetylene Flame Method ^[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ^[4] 3) Digestion, Inductively Coupled Plasma Method ^[4] <i>3) Digestion...</i>

น้ำใต้ดิน จำนวน 125 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
2	Acetone	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
3	Aldrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
4	Anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
5	Antimony	Digestion, Inductively Coupled Plasma Spectrometric Method ^[4]
6	Arsenic	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[4] 2) Digestion, Inductively Coupled Plasma Method ^[4]
7	Atrazine	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
8	Barium	1) Digestion, Direct Nitrous Oxide-Acetylene Flame Method ^[4] 2) Digestion, Inductively Coupled Plasma Spectrometric Method ^[4]
9	Benz(a)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
10	Benzene	Purge and Trap Gas Chromatographic/Mass spectrometric Method ^[4]
11	Benzo(b)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
12	Benzo(k)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4] 3100)

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
13	Benzoic acid	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
14	Benzo(a)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
15	Benzo(g,h,i)perylene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
16	Beryllium	Digestion, Inductively Coupled Plasma Spectrometric Method ^[4]
17	Bis(2-chloroethyl)ether	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
18	Bis(2-ethylhexyl)phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
19	Bromodichloromethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
20	Bromoform	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
21	Butanol	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
22	Butyl benzyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
23	Cadmium	1) Digestion, Direct Air-Acetylene Flame Method ^[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ^[4] 3) Digestion, Inductively Coupled Plasma Spectrometric Method ^[4]
24	Carbazole	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
25	Carbon disulfide	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
26	Carbon tetrachloride	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4] 3100)

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
27	Chlordane	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
28	p-Chloroaniline	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
29	Chlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
30	Chlorodibromomethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
31	Chloroform	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
32	2-Chlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
33	Chromium	1) Digestion, Direct Air-Acetylene Flame Method ^[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ^[4] 3) Digestion, Inductively Coupled Plasma Spectrometric Method ^[4]
34	Chromium (III)	1) Digestion, Direct Air-Acetylene Flame Method; Colorimetric Method; Calculation ^[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method; Colorimetric Method; Calculation ^[4] 3) Digestion, Inductively Coupled Plasma Spectrometric Method; Colorimetric Method; Calculation ^[4]
35	Chromium (VI)	1) Colorimetric Method ^[4] 2) Extraction, Air-Acetylene Flame Method ^[4]
36	Chrysene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4] <i>ส่ง</i>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
37	Cyanide	1) Distillation, Titrimetric Method ^[4] 2) Distillation, Colorimetric Method ^[4]
38	2,4-D	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
39	DDD	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
40	DDE	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
41	DDT	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
42	Dibenz(a,h)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
43	Di-n-butyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
44	1,2-Dichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
45	1,3-Dichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
46	1,4-Dichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
47	3,3'-Dichlorobenzidine	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
48	1,1-Dichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
49	1,2-Dichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4] <i>ส่ง</i>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
50	1,1-Dichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
51	cis-1,2-Dichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
52	trans-1,2-Dichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
53	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
54	1,2-Dichloropropane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
55	1,3-Dichloropropane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
56	1,3-Dichloropropene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
57	Dieldrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
58	Diethyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
59	2,4-Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
60	2,4-Dinitrophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
61	2,4-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
62	2,6-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
63	Di-n-Octyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
64	Endosulfan	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid...

2) Liquid-Liquid...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
65	Endrin	2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4] 1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
66	Ethylbenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
67	Fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
68	Fluorene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
69	Heptachlor	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
70	Heptachlor epoxide	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
71	Hexachlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
72	Hexachloro-1,3-butadiene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
73	n-Hexane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
74	α-HCH	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
75	β-HCH	1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4] 2) Liquid-Liquid...

2) Liquid-Liquid...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
76	γ -HCH	2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4] 1) Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
77	Hexachlorocyclopentadiene	2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4] Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
78	Hexachloroethane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
79	Indeno(1,2,3-cd)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
80	Isophorone	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
81	Lead	1) Digestion, Direct Air-Acetylene Flame Method ^[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ^[4] 3) Digestion, Inductively Coupled Plasma Spectrometric Method ^[4]
82	Manganese	1) Digestion, Direct Air-Acetylene Flame Method ^[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ^[4] 3) Digestion, Inductively Coupled Plasma Spectrometric Method ^[4]
83	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[4]
84	Methanol	Purge and Trap Gas Chromatographic/ Mass spectrometric Method ^[4]
85	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
86	Methyl bromide	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]

87 Methylene chloride...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
87	Methylene chloride	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
88	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
89	2-Methylnaphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
90	Methyl tert-butyl ether	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
91	Naphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
92	Nickel	1) Digestion, Direct Air-Acetylene Flame Method ^[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ^[4] 3) Digestion, Inductively Coupled Plasma Spectrometric Method ^[4]
93	Nitrobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
94	N-Nitrosodiphenylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
95	N-Nitrosodi-n-propylamine	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
96	Polychlorinated Biphenyls - PCB-1016 - PCB-1221 - PCB-1232 - PCB-1242 - PCB-1248 - PCB-1254 - PCB-1260	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
97	Pentachlorophenol	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
98	pH	Electrometric method ^[4]

99 Phenanthrene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
99	Phenanthrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
100	Phenol	1) Distillation, Chloroform Extraction Method ^[4] 2) Distillation, Direct Photometric Method ^[4] 3) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
101	Pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
102	Selenium	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[4] 2) Digestion, Inductively Coupled Plasma Method ^[4]
103	Silver	1) Digestion, Direct Air-Acetylene Flame Method ^[4] 2) Digestion, Inductively Coupled Plasma Method ^[4]
104	Styrene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
105	1,1,2,2-Tetrachloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
106	Tetrachloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
107	Toluene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
108	TPH (C ₅ -C ₈)	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[12,25]
109	TPH (C ₈ -C ₁₆)	1) Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^[9,21] 2) Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass spectrometric Method ^[9,25]
110	TPH (C ₁₆ -C ₃₅)	1) Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^[9,21] <i>วิธีนี้</i>

2) Separatory...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
		2) Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass spectrometric Method ^[9,25]
111	1,2,4-Trichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
112	1,1,1-Trichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
113	1,1,2-Trichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
114	Trichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
115	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
116	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
117	1,3,5-Trimethylbenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
118	Vanadium	Digestion, Inductively Coupled Plasma Spectrometric Method ^[4]
119	Vinyl acetate	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
120	Vinyl chloride	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
121	m-Xylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
122	o-Xylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
123	p-Xylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4]
124	Xylene (Total)	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ^[4] <i>วิธีนี้</i>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
125	Zinc	1) Digestion, Direct Air-Acetylene Flame Method ^[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ^[4] 3) Digestion, Inductively Coupled Plasma Spectrometric Method ^[4]

อากาศเสีย (ปล่อยระบาย) จำนวน 27 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Antimony	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method ^[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5]
2	Arsenic	1) Isokinetic Sampling, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5]
3	Beryllium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5]
4	Cadmium	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method ^[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5]
5	Carbon monoxide	Instrumental Analyzer Method ^[5]
6	Chlorine	1) Absorption Sampling, Ion Chromatographic Method ^[5] 2) Isokinetic Sampling, Ion Chromatographic Method ^[5]
7	Chromium	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method ^[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5]

8 Cobalt...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
8	Cobalt	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5]
9	Copper	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method ^[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5]
10	Cresol	Adsorption Sampling, Gas Chromatographic Method ^[5]
11	Dioxin/Furans	Isokinetic Sampling ^[5]
12	Hydrogen chloride	1) Absorption Sampling, Ion Chromatographic Method ^[5] 2) Isokinetic Sampling, Ion Chromatographic Method ^[5]
13	Hydrogen Fluoride	1) Absorption Sampling, Ion Chromatographic Method ^[5] 2) Isokinetic Sampling, Ion Chromatographic Method ^[5]
14	Hydrogen Sulfide	Absorption Sampling, Iodometric Method ^[5]
15	Lead	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method ^[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5]
16	Manganese	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method ^[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5]
17	Mercury	Isokinetic Sampling, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[5]
18	Nickel	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method ^[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5]

19 Opacity...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
19	Opacity	Ringelmann's Method ^[2]
20	Oxides of Nitrogen	1) Absorption Sampling, Phenoldisulfonic acid Method ^[5] 2) Absorption Sampling, Ion Chromatographic Method ^[5] 3) Instrumental Analyzer Method ^[5]
21	Selenium	1) Isokinetic Sampling, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5]
22	Sulfur dioxide	1) Isokinetic Sampling, Barium-Thorin Titrimetric Method ^[5] 2) Absorption Sampling, Barium-Thorin Titrimetric Method ^[5] 3) Instrumental Analyzer Method ^[5]
23	Sulfuric acid	Isokinetic Sampling, Barium-Thorin Titrimetric Method ^[5]
24	Tin	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5]
25	Total Suspended Particulate	1) Isokinetic Sampling, Gravimetric Method ^[5] 2) Paired Train, Isokinetic Sampling, Gravimetric Method ^[5]
26	Vanadium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ^[5]
27	Xylene	1) Adsorption Sampling, Gas Chromatographic Method ^[5] 2) Adsorption Sampling, Gas Chromatographic/Mass Spectrometric Method ^[5]

สิ่งปฏิกูล...

สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว จำนวน 34 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^[1,6,9,22] 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,6,9,27] 3) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,27]
2	Antimony	1) Waste Extraction, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 3) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[7,16] 4) Digestion, Inductively Coupled Plasma Method ^[7,14]
3	Arsenic	1) Waste Extraction, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[1,6,16] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 3) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[7,16] 4) Digestion, Inductively Coupled Plasma Method ^[7,14]
4	Barium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^[1,6,15]

2) Waste Extraction...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
5	Beryllium	2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 3) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 4) Digestion, Inductively Coupled Plasma Method ^[7,14]
6	Cadmium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]
7	Chlordane	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 3) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 4) Digestion, Inductively Coupled Plasma Method ^[7,14]
8	Chromium	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^[1,9,22] 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,27] 3) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,27] 1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] <i>3) Digestion...</i>

3) Digestion...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
9	Chromium (III)	3) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 4) Digestion, Inductively Coupled Plasma Method ^[7,14] 1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method; Waste Extraction, Colorimetric Method; Calculation ^[1,6,15,17] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction, Colorimetric Method; Calculation ^[1,6,14,17] 3) Digestion, Flame Atomic Absorption Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation ^[7,8,15,17] 4) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation ^[7,8,14,17]
10	Chromium (VI)	1) Waste Extraction, Colorimetric Method ^[1,17] 2) Alkaline Digestion, Colorimetric Method ^[8,17]
11	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]
12	Copper	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 3) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 4) Digestion, Inductively Coupled Plasma Method ^[7,14] <i>3) Digestion...</i>

13 2,4-D...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
13	2,4-D	1) Waste Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,25]
14	DDD	2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25] 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^[1,9,22] 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,27] 3) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,27]
15	DDE	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^[1,9,22] 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,27] 3) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,27]
16	DDT	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^[1,9,22] 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,27] 3) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,27]

17 Dieldrin...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
17	Dieldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^[1,9,22] 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,27] 3) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,27]
18	Endrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^[1,9,22] 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,27] 3) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,27]
19	Heptachlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^[1,9,22] 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,27] 3) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,27]
20	Lead	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14]

3) Digestion...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
21	Lindane	3) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 4) Digestion, Inductively Coupled Plasma Method ^[7,14] 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^[1,9,22] 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[1,9,27] 3) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 4) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,27]
22	Mercury	1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[1,18] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 3) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[19] 4) Digestion, Inductively Coupled Plasma Method ^[7,14]
23	Methoxychlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^[1,9,22] 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[1,9,27] 3) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 4) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,27]

24 Molybdenum...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
24	Molybdenum	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]
25	Nickel	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 3) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 4) Digestion, Inductively Coupled Plasma Method ^[7,14]
26	Polychlorinated Biphenyls - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^[1,9,23] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,23]
27	Pentachlorophenol	1) Waste Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[1,25] 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25]
28	pH	Electrometric Method ^[31,32]
29	Selenium	1) Waste Extraction, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[1,6,20] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 3) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[7,20]

4) Digestion...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
30	Silver	4) Digestion, Inductively Coupled Plasma Method ^[7,14] 1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]
31	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]
32	Trichloroethylene	1) Waste Extraction, Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[1,12,26] 2) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[12,26]
33	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]
34	Zinc	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 3) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 4) Digestion, Inductively Coupled Plasma Method ^[7,14]

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,27] <i>สมพงษ์</i>

2 Acetone...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
2	Acetone	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,26]
3	Aldrin	1) Ultrasonic Extraction, Gas Chromatographic Method ^[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^[11,27]
4	Anthracene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,27]
5	Antimony	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[7,16] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]
6	Arsenic	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[7,16] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]
7	Atrazine	Ultrasonic Extraction, Gas Chromatographic Method ^[11,24]
8	Barium	1) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]
9	Benz(a)anthracene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,27]
10	Benzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,26]
11	Benzo(b)fluoranthene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,27]
12	Benzo(k)fluoranthene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,27]
13	Benzoic acid	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^[11,27] <i>สมพงษ์</i>

14 Benzo(a)pyrene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
14	Benzo(a)pyrene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,27]
15	Benzo(g,h,i)perylene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,27]
16	Beryllium	Digestion, Inductively Coupled Plasma Method ^[7,14]
17	Bis(2-chloroethyl)ether	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,27]
18	Bis(2-ethylhexyl)phthalate	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,27]
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,26]
20	Bromoform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,26]
21	Butanol	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,26]
22	Butyl benzyl phthalate	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,27]
23	Cadmium	1) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]
24	Carbazole	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,27]
25	Carbon disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,26]
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,26]
27	Chlordane	1) Ultrasonic Extraction, Gas Chromatographic Method ^[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[11,27]

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
28	p-Chloroaniline	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,27]
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,26]
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,26]
31	Chloroform	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,26]
32	2-Chlorophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^[11,27]
33	Chromium	1) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]
34	Chromium (III)	1) Digestion, Flame Atomic Absorption Spectrometric Method; Colorimetric Method; Calculation ^[7,8,15,17] 2) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation ^[7,8,14,17]
35	Chromium (VI)	Alkaline Digestion, Colorimetric Method ^[8,17]
36	Chrysene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,27]
37	Cyanide	1) Extraction, Distillation, Titrimetric Method ^[28,29,30] 2) Extraction, Distillation, Colorimetric Method ^[28,29,30]
38	2,4-D	Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[24]
39	DDD	1) Ultrasonic Extraction, Gas Chromatographic Method ^[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[11,27]

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
40	DDE	1) Ultrasonic Extraction, Gas Chromatographic Method ^[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^[11,27]
41	DDT	1) Ultrasonic Extraction, Gas Chromatographic Method ^[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^[11,27]
42	Dibenz(a,h)anthracene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,27]
43	Di-n-butyl phthalate	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,27]
44	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,26]
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,26]
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,26]
47	3,3'-Dichlorobenzidine	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,27]
48	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,26]
49	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,26]
50	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,26]
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,26]
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,26]
53	2,4-Dichlorophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^[11,27]

54 1,2-Dichloropropane...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,26]
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,26]
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,26]
57	Dieldrin	1) Ultrasonic Extraction, Gas Chromatographic Method ^[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^[11,27]
58	Diethyl phthalate	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,27]
59	2,4-Dimethylphenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^[11,27]
60	2,4-Dinitrophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^[11,27]
61	2,4-Dinitrotoluene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,27]
62	2,6-Dinitrotoluene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,27]
63	Di-n-Octyl phthalate	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,27]
64	Endosulfan	1) Ultrasonic Extraction, Gas Chromatographic Method ^[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^[11,27]
65	Endrin	1) Ultrasonic Extraction, Gas Chromatographic Method ^[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^[11,27]
66	Ethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,26]

67 Fluoranthene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
67	Fluoranthene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,27]
68	Fluorene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[10,27]
69	Heptachlor	1) Ultrasonic Extraction, Gas Chromatographic Method ^[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[11,27]
70	Heptachlor epoxide	1) Ultrasonic Extraction, Gas Chromatographic Method ^[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[11,27]
71	Hexachlorobenzene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^[11,27]
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,26]
73	n-Hexane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,26]
74	α-HCH	1) Ultrasonic Extraction, Gas Chromatographic Method ^[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[11,27]
75	β-HCH	1) Ultrasonic Extraction, Gas Chromatographic Method ^[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[11,27]
76	γ-HCH	1) Ultrasonic Extraction, Gas Chromatographic Method ^[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[11,27]
77	Hexachlorocyclopentadiene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,27]

78 Hexachloroethane...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
78	Hexachloroethane	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,27]
79	Indeno(1,2,3-cd)pyrene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,27]
80	Isophorone	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,27]
81	Lead	1) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]
82	Manganese	1) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]
83	Mercury	1) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[19] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]
84	Methanol	Ultrasonic Extraction, Direct Aqueous Injection, Gas Chromatographic Method ^[11,21]
85	Methoxychlor	1) Ultrasonic Extraction, Gas Chromatographic Method ^[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[11,27]
86	Methyl bromide	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,26]
87	Methylene chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,26]
88	2-Methylphenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^[11,27]
89	2-Methylnaphthalene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^[11,27]


90 Methyl tert-butyl ether...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
90	Methyl tert-butyl ether	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,26]
91	Naphthalene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,27]
92	Nickel	1) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]
93	Nitrobenzene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,27]
94	N-Nitrosodiphenylamine	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,27]
95	N-Nitrosodi-n-propylamine	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,27]
96	Polychlorinated Biphenyls - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260	Soxhlet Extraction, Gas Chromatographic Method ^[10,23]
97	Pentachlorophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^[24]
98	Phenanthrene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,27]
99	Phenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^[11,27]
100	Pyrene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[10,27]
101	Selenium	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^[7,20]

2) Digestion...


ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
		2) Digestion, Inductively Coupled Plasma Method ^[7,14]
102	Silver	1) Digestion, Flame Atomic Absorption Spectrometric Method ^[7,15] 2) Digestion, Inductively Coupled Plasma Method ^[7,14]
103	Styrene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,26]
104	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,26]
105	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,26]
106	Toluene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,26]
107	TPH (C ₅ -C ₈)	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,26]
108	TPH (C ₈ -C ₁₆)	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,21] 2) Soxhlet Extraction, Gas Chromatographic/Mass spectrometric Method ^[10,26]
109	TPH (C ₁₆ -C ₃₅)	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,21] 2) Soxhlet Extraction, Gas Chromatographic/Mass spectrometric Method ^[10,26]
110	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,26]
111	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,26]
112	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,26]
113	Trichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[13,26]

114 2,4,5-Trichlorophenol...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
114	2,4,5-Trichlorophenol	Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,27)
115	2,4,6-Trichlorophenol	Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,27)
116	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,26)
117	Vanadium	Digestion, Inductively Coupled Plasma Method ^(7,14)
118	Vinyl acetate	Purge and Trap, Gas Chromatographic/Mass spectrometric Method ^(13,26)
119	Vinyl chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,26)
120	m-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,26)
121	o-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,26)
122	p-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,26)
123	Xylene (Total)	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,26)
124	Zinc	1) Digestion, Flame Atomic Absorption Spectrometric Method ^(7,15) 2) Digestion, Inductively Coupled Plasma Method ^(7,14) 

เอกสารอ้างอิง

- กระทรวงอุตสาหกรรม. ประกาศกระทรวงอุตสาหกรรม, พ.ศ. 2548. เรื่อง การกำจัดสิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว.ราชกิจจานุเบกษา. 25 มกราคม 2549. เล่มที่ 123 ตอนพิเศษ 11ง.
- กระทรวงอุตสาหกรรม. ประกาศกระทรวงอุตสาหกรรม, พ.ศ. 2549. เรื่อง กำหนดค่าปริมาณเข้มข้นที่เจือปนในอากาศที่ระบายออกจากปล่องของหม้อน้ำโรงสีข้าวที่ใช้แก๊สเป็นเชื้อเพลิง. ราชกิจจานุเบกษา. 4 ธันวาคม 2549. เล่มที่ 123 ตอนพิเศษ 125ง.
- สมาคมวิศวกรรมสิ่งแวดล้อมแห่งประเทศไทย. คู่มือวิเคราะห์น้ำเสีย. พิมพ์ครั้งที่ 4. กรุงเทพฯ: เรือนแก้วการพิมพ์, 2547.

4. APHA, AWWA, WEF. Standard Methods for the Examination of Water and Wastewater. 23rd 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 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 Pentafluorobenzoylation Derivatization. SW-846 Method 8151A, 1996.

26. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Volatile Organic Compounds by Gas Chromatography/ Mass Spectrometry (GC/MS). SW-846 Method 8260D, 2018.

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 8270E, 2018. *sm*

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. *sm*

ที่ อก ๐๓๑๐(๑)/ ๕๐๕๕



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๒๗ พฤษภาคม ๒๕๖๗

เรื่อง เปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท ซีคोट จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๒๑ พฤษภาคม ๒๕๖๗

ตามคำขอที่อ้างถึง บริษัท ซีคोट จำกัด ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๒๓๙
สถานที่ตั้งเลขที่ ๒๓๙ ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพมหานคร ขอเปลี่ยนแปลงบุคลากร
ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้ยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์
จำนวน ๒ ราย ได้แก่

๑) นายวัชรกานต์ ประมาคะเด

ทะเบียนเลขที่ ๖-๒๓๙-จ-๐๐๑๕

๒) นายรัตนชัย ขอบทำกิจ

ทะเบียนเลขที่ ๖-๒๓๙-จ-๐๐๓๐

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ


(นายพรยศ กลั่นกรอง)
รองอธิบดี ปฏิบัติราชการแทน
อธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๙๙

ไปรษณีย์อิเล็กทรอนิกส์ saraban@diw.mail.go.th

ที่ อก ๐๓๑๐(๑)/ ๑๑๕๕ ๗



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๒๑ พฤศจิกายน ๒๕๖๗

เรื่อง ยกเลิกบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท ซีคोट จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๕ พฤศจิกายน ๒๕๖๗

ตามคำขอที่อ้างถึง บริษัท ซีคोट จำกัด ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๒๓๙
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ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้ยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์
จำนวน ๓ ราย ได้แก่

๑) นางสาวพัชรา สมานฉันท์

ทะเบียนเลขที่ ๖-๒๓๙-จ-๐๐๒๑

๒) นางสาวสุภาวดี บัวแก้ว

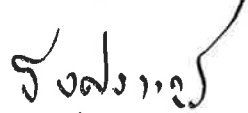
ทะเบียนเลขที่ ๖-๒๓๙-จ-๐๐๓๖

๓) นางสาวมาริยามณี ฮาแว

ทะเบียนเลขที่ ๖-๒๓๙-จ-๐๐๓๗

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ


(นายธีรทัศน์ อิศรางกูร ณ อยุธยา)
รองอธิบดี ปฏิบัติราชการแทน
อธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน

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โทร. ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๙๙

ไปรษณีย์อิเล็กทรอนิกส์ saraban@diw.mail.go.th



ภาคผนวก ข

ใบรับรองความสามารถห้องปฏิบัติการและขอบข่ายการรับรอง
ห้องปฏิบัติการทดสอบ ตามมาตรฐาน ISO/IEC 17025
จากสำนักงานมาตรฐานอุตสาหกรรม (สมอ.)



แบบ กษช./สมอ.๒
Form NSC/TISI 2

ใบรับรองเลขที่ 24-LB0026
(Certificate No.)

ใบรับรองระบบงาน (Certificate of Accreditation)

อาศัยอำนาจตามความในพระราชบัญญัติการมาตรฐานแห่งชาติ พ.ศ. ๒๕๕๑
(By Virtue of National Standardization Act B.E. 2551 (2008))

เลขาธิการสำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม
(Secretary-General, Thai Industrial Standards Institute)

ออกใบรับรองฉบับนี้ให้
(Issues this certificate to)

บริษัท ซีคอฟ จำกัด ฝ่ายห้องปฏิบัติการทดสอบด้านสิ่งแวดล้อม
(Secot Company Limited, Environmental Laboratory Division)

ตั้งอยู่เลขที่
(Address)

๒๓๙ ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพมหานคร
(239 Rimklongprapa Road, Bangsue, Bangsue, Bangkok)

ได้รับการรับรองความสามารถ
(Certificate of competence)

ตามมาตรฐานเลขที่ มอก. ๑๗๐๒๕ - ๒๕๖๑
(Standard No. TIS 17025-2561 (2018) (ISO/IEC 17025: 2017))

ข้อกำหนดทั่วไปว่าด้วยความสามารถของ ห้องปฏิบัติการทดสอบและห้องปฏิบัติการสอบเทียบ
(General requirements for the competence of testing and calibration laboratories)

หมายเลขการรับรองที่ ทดสอบ ๐๓๙๔
(Accreditation No. Testing 0394)

โดยมีรายละเอียดสาขาและขอบข่ายใบรับรอง แสดงไว้ใน QR CODE และ www.tisi.go.th
(Details of the scheme and scope of the certificate are shown in QR CODE and www.tisi.go.th)

ออกให้ ณ วันที่ ๖ ธันวาคม พ.ศ. ๒๕๖๑
(Issue date : 6 December B.E. 2566 (2023))

(นายวีระศักดิ์ เพ็งหล่ง)

ผู้อำนวยการสำนักงานคณะกรรมการการมาตรฐานแห่งชาติ
ปฏิบัติราชการแทน

เลขาธิการสำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม



Signed by สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม (สมอ.)
Thai Industrial Standards Institute (TISI)
Date: 2023-12-06T08:49:04.476+07:00

กระทรวงอุตสาหกรรม สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม
(Ministry of Industry Thailand, Thai Industrial Standards Institute)



รายละเอียดสาขาและขอบข่ายใบรับรองห้องปฏิบัติการ
(Scope of Accreditation for Testing)
ใบรับรองเลขที่ 24-LB0026
(Certification No. 24-LB0026)



ชื่อห้องปฏิบัติการ
(Laboratory Name)

หมายเลขการรับรองที่
(Accreditation No.)

ฉบับที่ 02
(Issue No.02)

สถานภาพห้องปฏิบัติการ
(Laboratory status)

บริษัท ซีคอฟ จำกัด ฝ่ายห้องปฏิบัติการทดสอบด้านสิ่งแวดล้อม
(Secot Company Limited, Environmental Laboratory Division)

ทดสอบ 0394
(Testing 0394)

ออกให้ตั้งแต่วันที่ 30 ตุลาคม พ.ศ. 2566
(Valid from) (30 October B.E.2566 (2023))

☒ถาวร
(Permanent)

☐นอกสถานที่
(Site)

☐ชั่วคราว
(Temporary)

ถึงวันที่ 8 กันยายน พ.ศ. 2571
(Until) (8 September B.E.2571 (2028))

☐เคลื่อนที่
(Mobile)

☐หลายสถานที่
(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 rd edition, 2017, Part 3030 F and Part 3114 C - Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WEF, 23 rd edition, 2017, Part 3030 E and Part 3120 B

กระทรวงอุตสาหกรรม สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม
(Ministry of Industry, Thai Industrial Standards Institute)

หน้าที่ 1/9

รายละเอียดสาขาและขอบข่ายใบรับรองห้องปฏิบัติการ

(Scope of Accreditation for Testing)

ใบรับรองเลขที่ 24-LB0026

(Certification No. 24-LB0026)



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)

☒ ถาวร
(Permanent)

☐ นอกสถานที่
(Site)

☐ชั่วคราว
(Temporary)

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(Mobile)

☐หลายสถานที่
(Multisite)

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"> ทองแดง (Copper, Cu) 0.02 mg/L ถึง 4.50 mg/L เหล็ก (Iron, Fe) 0.05 mg/L ถึง 9.00 mg/L ตะกั่ว (Lead, Pb) 0.03 mg/L ถึง 4.50 mg/L แมงกานีส (Manganese, Mn) 0.01 mg/L ถึง 9.00 mg/L นิกเกิล (Nickel, Ni) 0.01 mg/L ถึง 4.50 mg/L สังกะสี (Zinc, Zn) 0.02 mg/L ถึง 9.00 mg/L 	<p>- Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WEF, 23rd 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>2. บริเวณทำงาน (workplace)</p>	<p>- ซีโอดี (Chemical oxygen demand, COD) 100 mg/L ถึง 4 000 mg/L</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>- Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WEF, 23rd edition, 2017, Part 5220 D</p> <p>- NIOSH Manual of Analytical Methods (NMAM), method 0500, 4th edition, 15th August 1994 (Exclude Sampling)</p> <p>- NIOSH Manual of Analytical Methods (NMAM), method 0600, 4th edition, 15th January 1998 (Exclude Sampling)</p>

รายละเอียดสาขาและขอบข่ายใบรับรองห้องปฏิบัติการ

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สาขาการทดสอบ (Field of Testing)	รายการทดสอบ (Parameter)	วิธีทดสอบ (Test Method)
<p>สาขาสิ่งแวดล้อม (environmental field)</p> <p>2. บริเวณทำงาน (ต่อ) (workplace) (cont.)</p>	<ul style="list-style-type: none"> เบนซีน (Benzene) 1.10 µg/tube ถึง 420 µg/tube โทลูอีน (Toluene) 1.10 µg/tube ถึง 420 µg/tube โทไตรไซลีน (Total xylenes) 2.20 µg/tube ถึง 840 µg/tube เมตา, พารา-ไซลีน (m, p- Xylene) 1.10 µg/tube ถึง 420 µg/tube ออร์โธ-ไซลีน (o- Xylene) 1.10 µg/tube ถึง 420 µg/tube 	<ul style="list-style-type: none"> - NIOSH Manual of Analytical Methods (NMAM) , method 1501, 4th edition , 15th March 2003 (Exclude Sampling)
<p>3. ปล่องระบายอากาศ (stack)</p>	<ul style="list-style-type: none"> - ซัลเฟอร์ไดออกไซด์ (Sulfur dioxide) 1.00 mg/L ถึง 16 000 mg/L (solution) 	<ul style="list-style-type: none"> - US.EPA , Code of Federal Regulations , 40 CFR 60 appendix A , method 6 , July 2019 (Exclude Sampling)

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สาขาการทดสอบ (Field of Testing)	รายการทดสอบ (Parameter)	วิธีทดสอบ (Test Method)
<p>สาขาสิ่งแวดล้อม (environmental field)</p> <p>3. ปล่องระบายอากาศ (ต่อ) (stack) (cont.)</p>	<ul style="list-style-type: none"> - ไฮโดรเจนฟลูออไรด์ (Hydrogen fluoride) 5 µg/sample ถึง 400 µg/sample - ไฮโดรเจนคลอไรด์ (Hydrogen chloride) 5 µg/sample ถึง 400 µg/sample 	<ul style="list-style-type: none"> - WI-7.2-1-22 based on US.EPA , Code of Federal Regulations , 40 CFR 60 appendix A , method 26 , 2019 (Exclude Sampling)

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ฉบับที่ 02
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สถานภาพห้องปฏิบัติการ
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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"> คลอโรอีเทน (Chloroethene) 0.05 $\mu\text{g}/\text{m}^3$ ถึง 51.00 $\mu\text{g}/\text{m}^3$ (0.02 ppbv ถึง 20.00 ppbv) 1,3-บิวทาไดเอิน (1,3-butadiene) 0.04 $\mu\text{g}/\text{m}^3$ ถึง 44.00 $\mu\text{g}/\text{m}^3$ (0.02 ppbv ถึง 20.00 ppbv) โบรมอมีเทน (Bromomethane) 0.08 $\mu\text{g}/\text{m}^3$ ถึง 77.00 $\mu\text{g}/\text{m}^3$ (0.02 ppbv ถึง 20.00 ppbv) อะคลอลีน (Acrolein) 0.05 $\mu\text{g}/\text{m}^3$ ถึง 45.00 $\mu\text{g}/\text{m}^3$ (0.02 ppbv ถึง 20.00 ppbv) 	<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"> อะครีโลไนไตรล์ (Acrylonitrile) 0.04 $\mu\text{g}/\text{m}^3$ ถึง 43.00 $\mu\text{g}/\text{m}^3$ (0.02 ppbv ถึง 20.00 ppbv) ไดคลอโรมีเทน (Dichloromethane) 0.14 $\mu\text{g}/\text{m}^3$ to 69.00 $\mu\text{g}/\text{m}^3$ (0.04 ppbv ถึง 20.00 ppbv) คาร์บอนไดซัลไฟด์ (Carbon disulfide) 0.06 $\mu\text{g}/\text{m}^3$ ถึง 62.00 $\mu\text{g}/\text{m}^3$ (0.02 ppbv ถึง 20.00 ppbv) ไตรคลอโรมีเทน (Trichloromethane) 0.20 $\mu\text{g}/\text{m}^3$ ถึง 97.00 $\mu\text{g}/\text{m}^3$ (0.04 ppbv ถึง 20.00 ppbv) 1,2-ไดคลอโรอีเทน (1,2-dichloroethane) 0.08 $\mu\text{g}/\text{m}^3$ ถึง 80.00 $\mu\text{g}/\text{m}^3$ (0.02 ppbv ถึง 20.00 ppbv) 	<p>- WI-7.2-1-24 based on US EPA , Compendium Method TO-15 , EPA/625/R-96/010b, Second edition, January 1999</p>

รายละเอียดสาขาและขอบข่ายใบรับรองห้องปฏิบัติการ

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สาขาการทดสอบ (Field of Testing)	รายการทดสอบ (Parameter)	วิธีทดสอบ (Test Method)
สาขาสิ่งแวดล้อม (environmental field)		
4. บรรยากาศทั่วไป (ต่อ) (ambient air) (cont.)	<ul style="list-style-type: none"> - สารอินทรีย์ระเหยง่าย (Volatile organic compounds, VOCs) • เบนซีน (Benzene) 0.06 $\mu\text{g}/\text{m}^3$ ถึง 63.00 $\mu\text{g}/\text{m}^3$ (0.02 ppbv ถึง 20.00 ppbv) • คาร์บอนเตตระคลอไรด์ (Carbon tetrachloride) 0.25 $\mu\text{g}/\text{m}^3$ ถึง 125 $\mu\text{g}/\text{m}^3$ (0.04 ppbv ถึง 20.00 ppbv) • ไตรคลอโรเอทิลีน (Trichloroethylene) 0.21 $\mu\text{g}/\text{m}^3$ ถึง 107 $\mu\text{g}/\text{m}^3$ (0.04 ppbv ถึง 20.00 ppbv) • 1,2-ไดคลอโรโพรเพน (1,2-dichloropropane) 0.18 $\mu\text{g}/\text{m}^3$ ถึง 92.00 $\mu\text{g}/\text{m}^3$ (0.04 ppbv ถึง 20.00 ppbv) • เตตระคลอโรเอทิลีน (Tetrachloroethylene) 0.27 $\mu\text{g}/\text{m}^3$ ถึง 135 $\mu\text{g}/\text{m}^3$ (0.04 ppbv ถึง 20.00 ppbv) 	<p>- WI-7.2-1-24 based on US EPA , Compendium Method TO-15 , EPA/625/R-96/010b, Second edition, January 1999</p> <p>W</p>

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สาขาการทดสอบ (Field of Testing)	รายการทดสอบ (Parameter)	วิธีทดสอบ (Test Method)
สาขาสิ่งแวดล้อม (environmental field)		
4. บรรยากาศทั่วไป (ต่อ) (ambient air) (cont.)	<ul style="list-style-type: none"> - สารอินทรีย์ระเหยง่าย (Volatile organic compounds ,VOCs) • 1,2-ไดโบรมออีเทน (1,2-dibromoethane) 0.31 $\mu\text{g}/\text{m}^3$ ถึง 153 $\mu\text{g}/\text{m}^3$ (0.04 ppbv ถึง 20.00 ppbv) • 1,1,2,2-เตตระคลอโรอีเทน (1,1,2,2-tetrachloroethane) 0.69 $\mu\text{g}/\text{m}^3$ ถึง 137 $\mu\text{g}/\text{m}^3$ (0.10 ppbv ถึง 20.00 ppbv) • เบนซิลคลอไรด์ (Benzyl chloride) 0.52 $\mu\text{g}/\text{m}^3$ ถึง 103 $\mu\text{g}/\text{m}^3$ (0.10 ppbv ถึง 20.00 ppbv) • 1,4-ไดคลอโรเบนซีน (1,4-dichlorobenzene) 0.24 $\mu\text{g}/\text{m}^3$ ถึง 120 $\mu\text{g}/\text{m}^3$ (0.04 ppbv ถึง 20.00 ppbv) 	<p>- WI-7.2-1-24 based on US EPA , Compendium Method TO-15 , EPA/625/R-96/010b, Second edition, January 1999</p> <p>W</p>

ภาคผนวก ข

ใบอนุญาตเป็นนิติบุคคลผู้ให้บริการตรวจวัดและวิเคราะห์การทำงาน
จากกรมสวัสดิการและคุ้มครองแรงงาน



แบบ กภ.บญ
นิติบุคคล

กรมสวัสดิการและคุ้มครองแรงงาน

ใบอนุญาต

เป็นนิติบุคคลผู้ให้บริการตรวจวัดและวิเคราะห์สภาวะการทำงานเกี่ยวกับระดับเสียง

ใบอนุญาตเลขที่ ๐๔๐๓-๐๓-๒๕๖๕-๐๐๔๘

อนุญาตให้ บริษัท ซีตอท จำกัด

เลขทะเบียนนิติบุคคล ๐๑๐๕๕๓๖๐๐๐๔๗๖

ตั้งอยู่ เลขที่ ๒๓๙ ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพมหานคร

เป็นนิติบุคคลผู้ให้บริการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน ตามกฎกระทรวงกำหนดมาตรฐานในการบริหาร จัดการ และดำเนินการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงานเกี่ยวกับความร้อน แสงสว่าง และเสียง พ.ศ. ๒๕๕๙ ในการตรวจวัดและวิเคราะห์สภาวะการทำงานเกี่ยวกับระดับเสียง ประกอบกับกฎกระทรวงการขึ้นทะเบียนและการอนุญาตให้บริการเพื่อส่งเสริม ความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน พ.ศ. ๒๕๖๔ แห่งพระราชบัญญัติความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน พ.ศ. ๒๕๕๔ โดยมีบุคลากร จำนวน ๕ ราย ดังรายชื่อแนบท้ายใบอนุญาตนี้

ทั้งนี้ ตั้งแต่วันที่ ๑๗ มิถุนายน พ.ศ. ๒๕๖๕ ถึงวันที่ ๑๖ มิถุนายน พ.ศ. ๒๕๖๘

ให้ไว้ ณ วันที่ ๑๗ มิถุนายน พ.ศ. ๒๕๖๕

(นายสมพงษ์ กวางแก้ว)

รองอธิบดี ปฏิบัติราชการแทน

อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน

เลขทะเบียนควบคุม

ป-๑๓-๐๔๐๓-๐๔๘-๐๑-๖๕

(ลงนาม)

(นายทะเบียน)

(นายศักดิ์ศิลป์ คุลธาร)

ตำแหน่ง ผู้อำนวยการกองความปลอดภัยแรงงาน

รายชื่อบุคลากรแนบท้ายใบอนุญาต
เป็นนิติบุคคลผู้ให้บริการตรวจวัดและวิเคราะห์สถานะการทำงานเกี่ยวกับระดับเสียง
ของบริษัท ซีคอท จำกัด
ใบอนุญาตเลขที่ ๐๔๐๓-๐๓-๒๕๖๕-๐๐๔๘

- | | |
|-------------------|----------------|
| ๑. นางสาวสุนันทา | ศิริพัฒน์นันท์ |
| ๒. นางสาวกนิษฐา | เจริญเชื้อ |
| ๓. นางสาวปัทมวรรณ | สุวรรณวิโรจน์ |
| ๔. นางสาวอลิษา | คณิธรานนท์ |
| ๕. นางสาวชนิดา | หล้าสาย |

ทั้งนี้ ตั้งแต่วันที่ ๑๗ มิถุนายน พ.ศ. ๒๕๖๕ ถึงวันที่ ๑๖ มิถุนายน พ.ศ. ๒๕๖๘

ให้ไว้ ณ วันที่ ๑๗ มิถุนายน พ.ศ. ๒๕๖๕



(นายสมพนธ์ กวางแก้ว)

รองอธิบดี ปฏิบัติราชการแทน
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน

รายชื่อบุคลากร (เพิ่มเติม)
แนบท้ายใบอนุญาตเป็นนิติบุคคลผู้ให้บริการตรวจวัดและวิเคราะห์สถานะการทำงานเกี่ยวกับระดับเสียง
ของบริษัท ซีคอท จำกัด
ใบอนุญาตเลขที่ ๐๔๐๓-๐๓-๒๕๖๕-๐๐๔๘

- | | |
|-------------------|-------------|
| ๑. นางสาวศลิษา | อินริย์ |
| ๒. นางสาวมาริยาณี | ฮาแว |
| ๓. นางสาววิระยา | ปัจฉิมบุรณ์ |

ทั้งนี้ ตั้งแต่วันที่ ๑๙ มกราคม พ.ศ. ๒๕๖๖ ถึงวันที่ ๑๖ มิถุนายน พ.ศ. ๒๕๖๘

ให้ไว้ ณ วันที่ ๑๙ มกราคม พ.ศ. ๒๕๖๖



(นายสมพนธ์ กวางแก้ว)

รองอธิบดี ปฏิบัติราชการแทน
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน