

ภาคผนวก ง

ใบรับรองผลการตรวจวัดและวิเคราะห์

คุณภาพอากาศในบรรยากาศ



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

AMBIENT AIR QUALITY ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical Public Co., Ltd, Branch 6 (Refinery GC 6)	REQUEST SERVICE No.	: 0042/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Subatmospheric Pressure Sampling
SAMPLING DATE	: 08-09/01/2024	ANALYTICAL DATE	: 11/01/2024
SAMPLING TIME	: 10:25-10:56	SAMPLE CONDITION	: Normal
RECEIVED DATE	: 10/01/2024	FILE CODE	: 224010_TO-15_January
REPORT DATE	: 15/01/2024		

Compound	Non Detection		SAMPLING LOCATION		STANDARD* (µg/m ³)
			Takuan-Ao Pradu Community 1		
	ppbv	µg/m ³	ppbv	µg/m ³	
Benzene	0.004	0.013	1.69	5.40	7.6

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

Sirivan Chimsa-nga

(Miss Sirivan Chimsa-nga)

Analyst

MR

(Mrs. Araya Tipparuk)

Technical Management Team

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

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

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

R:\Database\Windrose\FileControl\Win-224010-Takuan-Ao pradu Community 1 08-09 Jan 2024



Meteorological Monitoring Results : Wind Rose MTR-PTTGC6-Refinery

Location : Takuan-Ao pradu Community 1

Monitor period : 08-09 Jan 2024

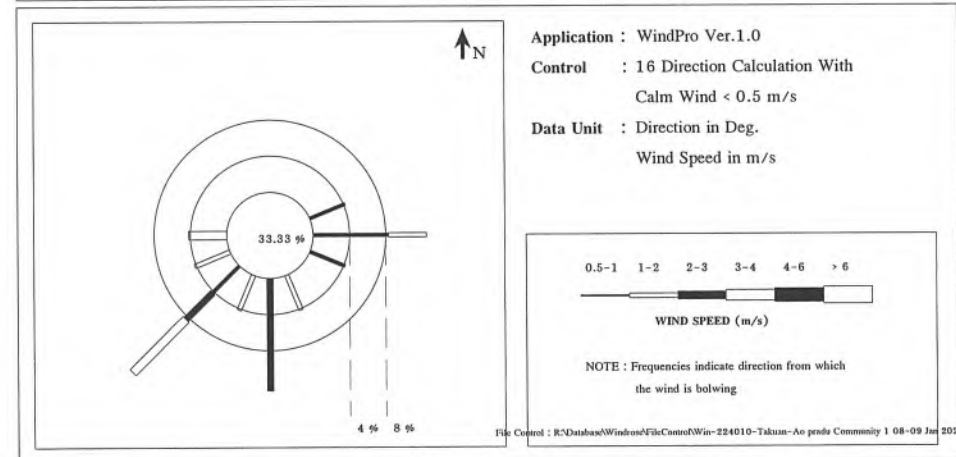
Wind Speed Model : NRG Symphonie

Serial No : 10853

Wind Direction Model : NRG Symphonie

Serial No : 10853

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NNE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ENE	0.0417	0.0000	0.0000	0.0000	0.0000	0.0000	0.0417
E	0.0833	0.0417	0.0000	0.0000	0.0000	0.0000	0.1250
ESE	0.0417	0.0000	0.0000	0.0000	0.0000	0.0000	0.0417
SE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SSE	0.0000	0.0417	0.0000	0.0000	0.0000	0.0000	0.0417
S	0.0000	0.0000	0.1250	0.0000	0.0000	0.0000	0.1250
SSW	0.0000	0.0417	0.0000	0.0000	0.0000	0.0000	0.0417
SW	0.0417	0.0000	0.0417	0.0833	0.0000	0.0000	0.1667
WSW	0.0000	0.0417	0.0000	0.0000	0.0000	0.0000	0.0417
W	0.0000	0.0000	0.0000	0.0417	0.0000	0.0000	0.0417
WNW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NNW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CALM	0.3333						



(Miss Katesarin Vorradetwittaya)
Environmental Scientist

Preeda S.
(Miss Preeda Somjai)
Technical Management Team



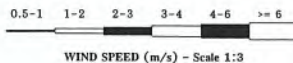
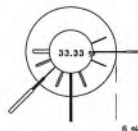
Meteorological Monitoring Results : Wind Rose

MTR-PTTGC6-Refinery

Location : Takuan-Ao pradu Community 1 Monitor period : 08-09 Jan 2024
 Wind Speed Model : NRG Symphonie Serial No : 10853
 Wind Direction Model : NRG Symphonie Serial No : 10853

Time	08-09 Jan 2024	
	WS(m/s)	WD
10:00 - 11:00	1.8	SSE
11:00 - 12:00	2.9	S
12:00 - 13:00	2.9	S
13:00 - 14:00	2.9	S
14:00 - 15:00	3.5	SW
15:00 - 16:00	3.9	W
16:00 - 17:00	3.3	SW
17:00 - 18:00	2.8	SW
18:00 - 19:00	1.6	WSW
19:00 - 20:00	0.9	SW
20:00 - 21:00	0.2	SE
21:00 - 22:00	0.2	SW
22:00 - 23:00	0.3	E
23:00 - 24:00	0.5	E
00:00 - 01:00	0.5	ESE
01:00 - 02:00	0.0	N
02:00 - 03:00	0.0	N
03:00 - 04:00	0.1	ESE
04:00 - 05:00	0.5	E
05:00 - 06:00	0.2	ENE
06:00 - 07:00	0.3	ENE
07:00 - 08:00	0.7	ENE
08:00 - 09:00	1.2	E
09:00 - 10:00	1.0	SSW

Wind Rose



File Control :R:\Database\WinData\Win-224010-Takuan-Ao pradu Community 1 08-09 Jan 2024

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



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SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Subatmospheric Pressure Sampling
SAMPLING DATE	: 08-09/01/2024	ANALYTICAL DATE	: 11/01/2024
SAMPLING TIME	: 10:37-11:11	SAMPLE CONDITION	: Normal
RECEIVED DATE	: 10/01/2024	FILE CODE	: 224010_TO-15_January
REPORT DATE	: 15/01/2024		

Compound	Non Detection		SAMPLING LOCATION		STANDARD* ($\mu\text{g}/\text{m}^3$)
			Takuan-Ao Pradu Community 2		
	ppbv	$\mu\text{g}/\text{m}^3$	ppbv	$\mu\text{g}/\text{m}^3$	
Benzene	0.004	0.013	1.45	4.63	7.6

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

(Miss Siriwan Chimsa-nga)

Analyst

(Mrs. Anya Tippasuk)

Technical Management Team

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Meteorological Monitoring Results : Wind Rose

MTR-PTTGC6-Refinery

Location : Takuan-Ao pradu Community 2

Monitor period : 08-09 Jan 2024

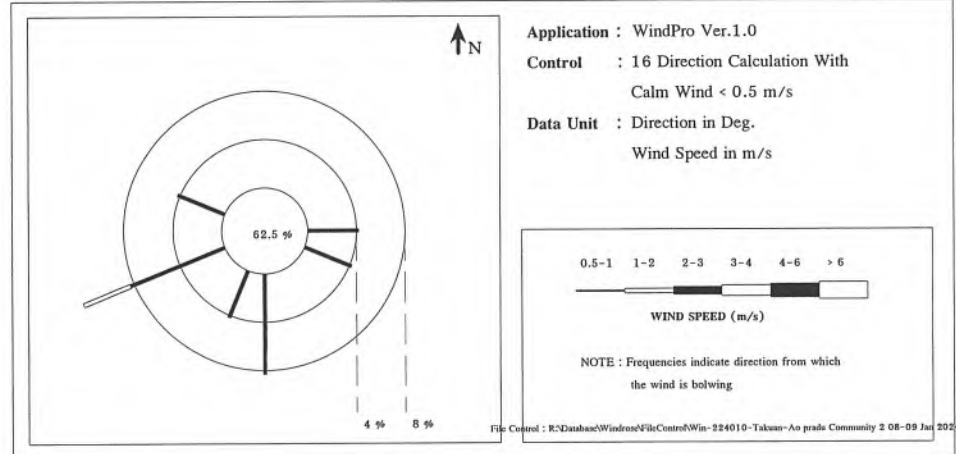
Wind Speed Model : NRG Symphonie

Serial No : 10693

Wind Direction Model : NRG Symphonie

Serial No : 10693

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NNE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ENE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
E	0.0417	0.0000	0.0000	0.0000	0.0000	0.0000	0.0417
ESE	0.0417	0.0000	0.0000	0.0000	0.0000	0.0000	0.0417
SE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SSE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
S	0.0833	0.0000	0.0000	0.0000	0.0000	0.0000	0.0833
SSW	0.0417	0.0000	0.0000	0.0000	0.0000	0.0000	0.0417
SW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
WSW	0.0833	0.0417	0.0000	0.0000	0.0000	0.0000	0.1250
W	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
WNW	0.0417	0.0000	0.0000	0.0000	0.0000	0.0000	0.0417
NW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NNW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CALM	0.6250						



(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose

MTR-PTTGC6-Refinery

Location : Takuan-Ao pradu Community 2

Monitor period : 08-09 Jan 2024

Wind Speed Model : NRG Symphonie

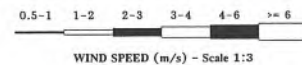
Serial No : 10693

Wind Direction Model : NRG Symphonie

Serial No : 10693

Time	08-09 Jan 2024	
	WS(m/s)	WD
10:00 - 11:00	0.3	SSE
11:00 - 12:00	0.5	SSW
12:00 - 13:00	0.5	S
13:00 - 14:00	0.5	S
14:00 - 15:00	0.7	WSW
15:00 - 16:00	1.1	WSW
16:00 - 17:00	0.8	WSW
17:00 - 18:00	0.4	W
18:00 - 19:00	0.3	WNW
19:00 - 20:00	0.1	WNW
20:00 - 21:00	0.0	WNW
21:00 - 22:00	0.4	WNW
22:00 - 23:00	0.5	WNW
23:00 - 24:00	0.0	NNW
00:00 - 01:00	0.4	NNE
01:00 - 02:00	0.3	NNE
02:00 - 03:00	0.0	N
03:00 - 04:00	0.0	N
04:00 - 05:00	0.5	E
05:00 - 06:00	0.7	ESE
06:00 - 07:00	0.0	N
07:00 - 08:00	0.1	WNW
08:00 - 09:00	0.4	WNW
09:00 - 10:00	0.4	WNW

Wind Rose



(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



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AMBIENT AIR QUALITY ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical Public Co., Ltd, Branch 6	REQUEST SERVICE No.	: 0201/67
	(Refinery GC 6)	SAMPLING METHOD	: Subatmospheric Pressure Sampling
SAMPLING BY	: SECOT Co., Ltd.	ANALYTICAL DATE	: 21/02/2024
SAMPLING DATE	: 01-02/2024	SAMPLE CONDITION	: Normal
SAMPLING TIME	: 10:50-10:55	FILE CODE	: 224010_TO-15_February
RECEIVED DATE	: 03/02/2024		
REPORT DATE	: 22/02/2024		

Compound	Non Detection		SAMPLING LOCATION		STANDARD* ($\mu\text{g}/\text{m}^3$)
			Takuan-Ae Pradu Community I		
	ppbv	$\mu\text{g}/\text{m}^3$	ppbv	$\mu\text{g}/\text{m}^3$	
Benzene	0.004	0.013	0.42	1.34	7.6

Methods for the Determination of Toxic Organic Compound in Ambient Air, 4th: EPA Methods TO-15, 1999

Siriwan Chimsa-nga
(Miss Siriwan Chimsa-nga)

Analyst

MT
(Mrs. Araya Tipparuk)

Technical Management Team

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R:\Database\Windrose\FileControl\Win-224010-Takuan-Ao pradu Community 1 01-02 Feb 2024



Meteorological Monitoring Results : Wind Rose MTR-PTTGC6-Refinery

Location : Takuan-Ao pradu Community 1 Monitor period : 01-02 Feb 2024

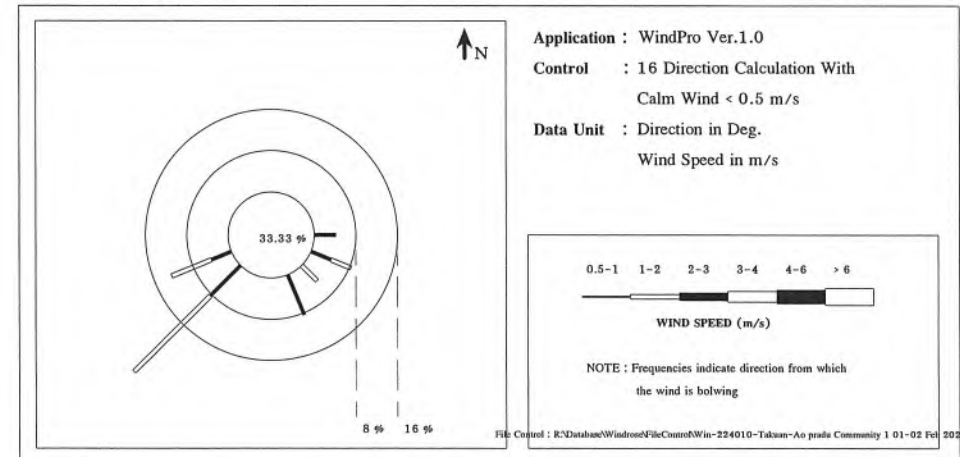
Wind Speed Model : Novalynx WS-25

Serial No : A5084

Wind Direction Model : Novalynx WS-25

Serial No : A5084

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NNE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ENE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
E	0.0417	0.0000	0.0000	0.0000	0.0000	0.0000	0.0417
ESE	0.0417	0.0417	0.0000	0.0000	0.0000	0.0000	0.0833
SE	0.0000	0.0417	0.0000	0.0000	0.0000	0.0000	0.0417
SSE	0.0833	0.0000	0.0000	0.0000	0.0000	0.0000	0.0833
S	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SSW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SW	0.0833	0.2083	0.0000	0.0000	0.0000	0.0000	0.2917
WSW	0.0417	0.0833	0.0000	0.0000	0.0000	0.0000	0.1250
W	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
WNW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NNW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CALM	0.3333						



(Miss Katesarin Vorradetwittaya)
Environmental Scientist

Preeda S.
(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose

MTR-PTTGC6-Refinery

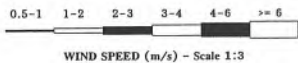
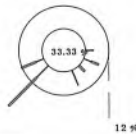
Location : Takuan-Ao pradu Community 1 Monitor period : 01-02 Feb 2024

Wind Speed Model : Novalynx WS-25 Serial No : A5084

Wind Direction Model : Novalynx WS-25 Serial No : A5084

Time	01-02 Feb 2024	
	WS(m/s)	WD
10:00 - 11:00	0.5	SW
11:00 - 12:00	0.7	E
12:00 - 13:00	0.8	SSE
13:00 - 14:00	1.2	SW
14:00 - 15:00	0.7	SSE
15:00 - 16:00	0.4	SSW
16:00 - 17:00	0.3	SW
17:00 - 18:00	0.5	SW
18:00 - 19:00	0.2	SW
19:00 - 20:00	0.3	WSW
20:00 - 21:00	0.9	SW
21:00 - 22:00	0.3	SW
22:00 - 23:00	1.1	SW
23:00 - 24:00	1.0	SW
00:00 - 01:00	1.1	SW
01:00 - 02:00	1.3	SW
02:00 - 03:00	0.5	SW
03:00 - 04:00	0.3	SW
04:00 - 05:00	0.9	WSW
05:00 - 06:00	1.3	WSW
06:00 - 07:00	1.4	WSW
07:00 - 08:00	0.7	ESE
08:00 - 09:00	1.3	ESE
09:00 - 10:00	1.3	SE

Wind Rose



File Control : R:\Database\Windrose\FireControl\Win-224010-Takuan-Ao pradu Community 1 01-02 Feb 2024



บริษัท ซีคอต จำกัด

SECOT CO., LTD.

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AMBIENT AIR QUALITY ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical Public Co., Ltd, Branch 6	REQUEST SERVICE No.	: 0201/67
	(Refinery GC 6)	SAMPLING METHOD	: Subatmospheric Pressure Sampling
SAMPLING BY	: SECOT Co., Ltd.	ANALYTICAL DATE	: 21/02/2024
SAMPLING DATE	: 01-02/02/2024	SAMPLE CONDITION	: Normal
SAMPLING TIME	: 10:40-10:45	FILE CODE	: 224010_TO-15_February
RECEIVED DATE	: 03/02/2024		
REPORT DATE	: 22/02/2024		

Compound	Non Detection		SAMPLING LOCATION		STANDARD* ($\mu\text{g}/\text{m}^3$)
			Takuan-Ao Pradu Community 2		
	ppbv	$\mu\text{g}/\text{m}^3$	ppbv	$\mu\text{g}/\text{m}^3$	
Benzene	0.004	0.013	0.13	0.42	7.6

Methods for the Determination of Toxic Organic Compound in Ambient Air, 3rd : EPA Methods TO-15,1999

Siriwan Chimsa-nga
(Miss Siriwan Chimsa-nga)

Analyst

Araya Tipparak
(Mrs. Araya Tipparak)

Technical Management Team

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(Miss Katesarin Vorradetwittaya)

Environmental Scientist

Preeda S.

(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose

MTR-PTTGC6-Refinery

Location : Takuan-Ao pradu Community 2

Monitor period : 01-02 Feb 2024

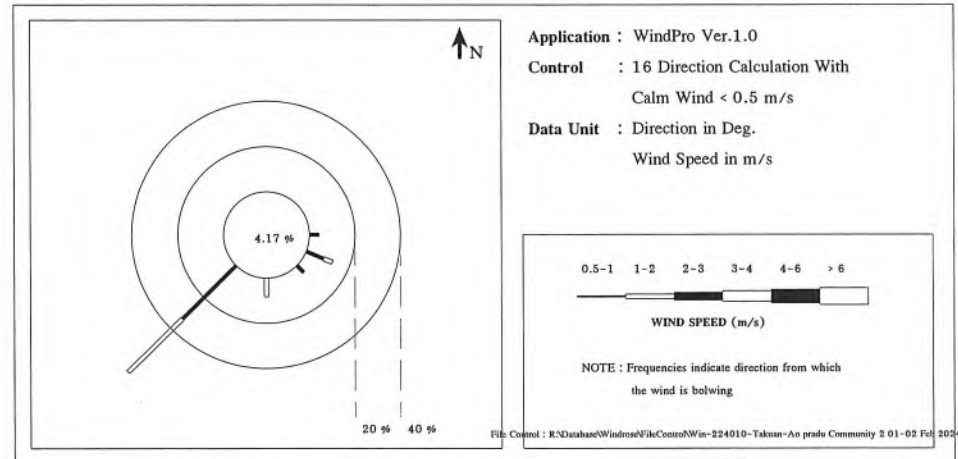
Wind Speed Model : Novalynx WS-25

Serial No : A4907

Wind Direction Model : Novalynx WS-25

Serial No : A4907

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NNE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ENE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
E	0.0417	0.0000	0.0000	0.0000	0.0000	0.0000	0.0417
ESE	0.0833	0.0417	0.0000	0.0000	0.0000	0.0000	0.1250
SE	0.0417	0.0000	0.0000	0.0000	0.0000	0.0000	0.0417
SSE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
S	0.0000	0.0833	0.0000	0.0000	0.0000	0.0000	0.0833
SSW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SW	0.3333	0.3333	0.0000	0.0000	0.0000	0.0000	0.6667
WSW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
W	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
WNW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NNW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CALM	0.0417						



(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose

MTR-PTTGC6-Refinery

Location : Takuan-Ao pradu Community 2

Monitor period : 01-02 Feb 2024

Wind Speed Model : Novalynx WS-25

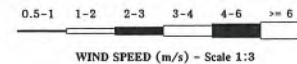
Serial No : A4907

Wind Direction Model : Novalynx WS-25

Serial No : A4907

Time	01-02 Feb 2024	
	WS(m/s)	WD
10:00 - 11:00	0.5	SW
11:00 - 12:00	0.6	E
12:00 - 13:00	0.6	SE
13:00 - 14:00	1.3	S
14:00 - 15:00	0.1	SE
15:00 - 16:00	1.2	S
16:00 - 17:00	1.3	SW
17:00 - 18:00	0.5	SW
18:00 - 19:00	1.2	SW
19:00 - 20:00	0.9	SW
20:00 - 21:00	1.1	SW
21:00 - 22:00	0.6	SW
22:00 - 23:00	1.2	SW
23:00 - 24:00	1.3	SW
00:00 - 01:00	1.0	SW
01:00 - 02:00	0.7	SW
02:00 - 03:00	1.0	SW
03:00 - 04:00	1.0	SW
04:00 - 05:00	0.5	SW
05:00 - 06:00	0.5	SW
06:00 - 07:00	0.8	SW
07:00 - 08:00	0.9	ESE
08:00 - 09:00	1.1	ESE
09:00 - 10:00	0.9	ESE

Wind Rose



(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



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

AMBIENT AIR QUALITY ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical Public Co., Ltd, Branch 6 (Refinery GC 6)	REQUEST SERVICE No.	: 0406/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Subatmospheric Pressure Sampling
SAMPLING DATE	: 04-05/03/2024	ANALYTICAL DATE	: 07/03/2024
SAMPLING TIME	: 10:40-10:43	SAMPLE CONDITION	: Normal
RECEIVED DATE	: 06/03/2024	FILE CODE	: 224010_TO-15_March
REPORT DATE	: 18/03/2024		

Compound	Non Detection		SAMPLING LOCATION		STANDARD* (µg/m ³)
			Takuan-Ao Pradu Community 1		
	ppbv	µg/m ³	ppbv	µg/m ³	
Benzene	0.004	0.013	0.46	1.47	7.6

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

Siriwan Chimsanga
(Miss Siriwan Chimsa-nga)

Analyst

Araya Tipparuk
(Mrs. Araya Tipparuk)

Technical Management Team

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

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

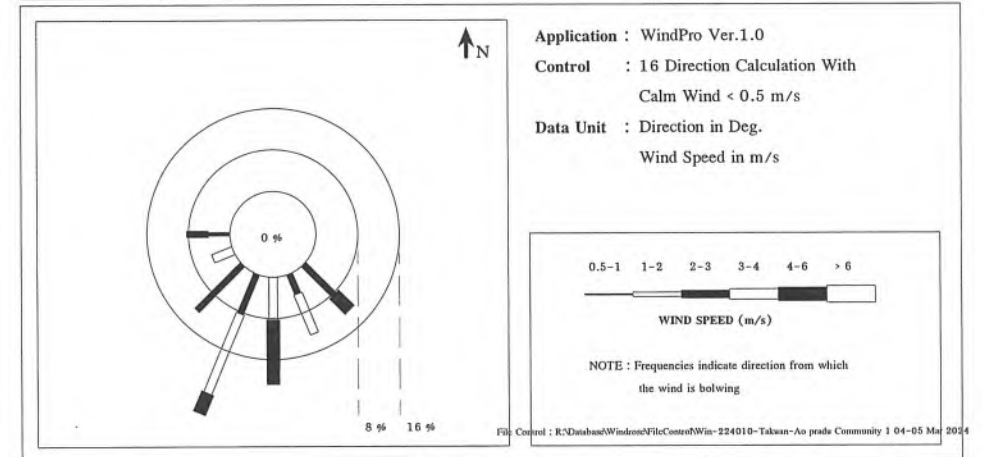
R:\Database\Windrose\FileControl\Win-224010-Takuan-Ao pradu Community 1 04-05 Mar 2024



Meteorological Monitoring Results : Wind Rose
MTR-PTTGC6-Refinery

Location : Takuan-Ao pradu Community 1
Wind Speed Model : Campbell CR510
Wind Direction Model : Campbell CR510
Monitor period : 04-05 Mar 2024
Serial No : 10851
Serial No : 10851

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NNE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ENE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
E	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ESE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SE	0.0000	0.0000	0.0833	0.0000	0.0417	0.0000	0.1250
SSE	0.0000	0.0000	0.0417	0.0833	0.0000	0.0000	0.1250
S	0.0000	0.0000	0.0000	0.0833	0.1250	0.0000	0.2083
SSW	0.0000	0.0000	0.0833	0.1667	0.0417	0.0000	0.2917
SW	0.0000	0.0000	0.1250	0.0000	0.0000	0.0000	0.1250
WSW	0.0000	0.0000	0.0000	0.0417	0.0000	0.0000	0.0417
W	0.0417	0.0000	0.0417	0.0000	0.0000	0.0000	0.0833
WNW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NNW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CALM	0.0000						



Katesarin Vorradetwittaya
(Miss Katesarin Vorradetwittaya)
Environmental Scientist

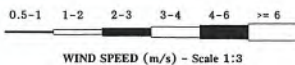
Preeda S.
(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose

MTR-PTTGC6-Refinery

Location : Takuan-Ao pradu Community 1		Monitor period : 04-05 Mar 2024	
Wind Speed Model : Campbell CR510		Serial No : 10851	
Wind Direction Model : Campbell CR510		Serial No : 10851	
Time	04-05 Mar 2024		WD
	WS(m/s)		
10:00 - 11:00	0.9		W
11:00 - 12:00	4.3		S
12:00 - 13:00	4.5		SSW
13:00 - 14:00	4.2		S
14:00 - 15:00	4.3		SE
15:00 - 16:00	4.0		S
16:00 - 17:00	3.8		SSW
17:00 - 18:00	2.7		SE
18:00 - 19:00	2.1		SE
19:00 - 20:00	2.0		W
20:00 - 21:00	2.8		SSW
21:00 - 22:00	3.0		SSE
22:00 - 23:00	3.1		S
23:00 - 24:00	3.1		SSW
00:00 - 01:00	3.3		SSW
01:00 - 02:00	3.2		WSW
02:00 - 03:00	2.8		SW
03:00 - 04:00	3.2		S
04:00 - 05:00	2.9		SSW
05:00 - 06:00	2.4		SSE
06:00 - 07:00	2.3		SW
07:00 - 08:00	2.7		SW
08:00 - 09:00	3.1		SSW
09:00 - 10:00	3.1		SSE
Wind Rose			



File Control : R:\Database\Windrose\FileControl\Win-224010-Takuan-Ao pradu Community 1 04-05 Mar 2024

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



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

AMBIENT AIR QUALITY ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical Public Co., Ltd, Branch 6 (Refinery GC 6)	REQUEST SERVICE No.	: 0406/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Subatmospheric Pressure Sampling
SAMPLING DATE	: 04-05/03/2024	ANALYTICAL DATE	: 07/03/2024
SAMPLING TIME	: 10:28-10:28	SAMPLE CONDITION	: Normal
RECEIVED DATE	: 06/03/2024	FILE CODE	: 224010_TO-15_March
REPORT DATE	: 18/03/2024		

Compound	Non Detection		SAMPLING LOCATION		STANDARD*
	ppbv	µg/m ³	Takuan-Ao Pradu Community 2	µg/m ³	
Benzene	0.004	0.013	0.22	0.70	7.6

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

(Miss Siriwan Chimsa-nga)

Analyst

(Mrs. Araya Tippasuk)

Technical Management Team

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Meteorological Monitoring Results : Wind Rose

MTR-PTTGC6-Refinery

Location : Takuan-Ao pradu Community 2

Monitor period : 04-05 Mar 2024

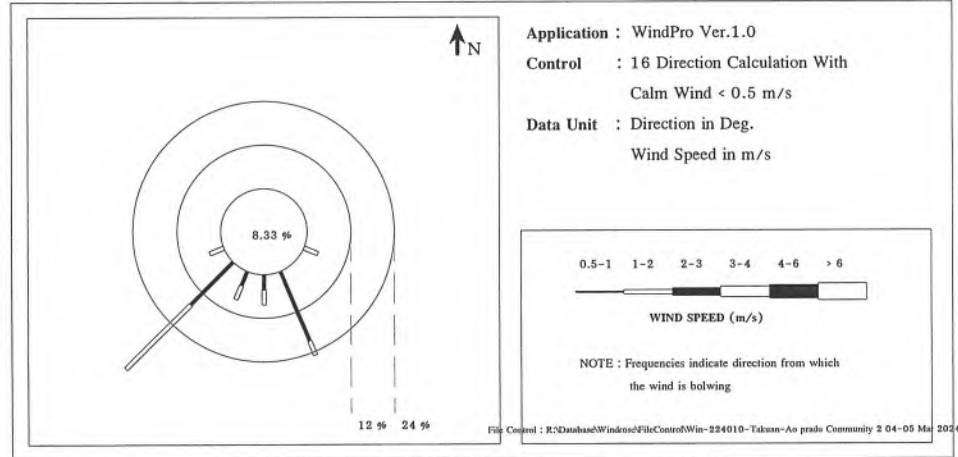
Wind Speed Model : Campbell CR510

Serial No : 10693

Wind Direction Model : Campbell CR510

Serial No : 10693

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NNE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ENE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
E	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ESE	0.0000	0.0417	0.0000	0.0000	0.0000	0.0000	0.0417
SE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SSE	0.2083	0.0417	0.0000	0.0000	0.0000	0.0000	0.2500
S	0.0417	0.0417	0.0000	0.0000	0.0000	0.0000	0.0833
SSW	0.0417	0.0417	0.0000	0.0000	0.0000	0.0000	0.0833
SW	0.1667	0.2500	0.0000	0.0000	0.0000	0.0000	0.4167
WSW	0.0000	0.0417	0.0000	0.0000	0.0000	0.0000	0.0417
W	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
WNW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NNW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CALM	0.0833						



(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose

MTR-PTTGC6-Refinery

Location : Takuan-Ao pradu Community 2

Monitor period : 04-05 Mar 2024

Wind Speed Model : Campbell CR510

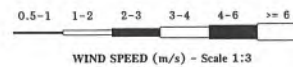
Serial No : 10693

Wind Direction Model : Campbell CR510

Serial No : 10693

Time	04-05 Mar 2024	
	WS(m/s)	WD
10:00 - 11:00	1.4	SW
11:00 - 12:00	1.7	SW
12:00 - 13:00	1.7	SW
13:00 - 14:00	1.7	WSW
14:00 - 15:00	1.4	S
15:00 - 16:00	1.1	SSW
16:00 - 17:00	1.0	SW
17:00 - 18:00	1.0	ESE
18:00 - 19:00	1.3	SSE
19:00 - 20:00	0.8	SSE
20:00 - 21:00	0.6	SSE
21:00 - 22:00	0.7	SSE
22:00 - 23:00	0.7	SW
23:00 - 24:00	0.9	SSE
00:00 - 01:00	1.0	SW
01:00 - 02:00	0.8	SW
02:00 - 03:00	0.8	SSW
03:00 - 04:00	0.9	SW
04:00 - 05:00	0.7	SSE
05:00 - 06:00	0.4	SW
06:00 - 07:00	0.3	WNW
07:00 - 08:00	0.5	S
08:00 - 09:00	0.8	SW
09:00 - 10:00	1.1	SW

Wind Rose



(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



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

AMBIENT AIR QUALITY ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical Public Co., Ltd. Branch 6 (Refinery GC 6)	REQUEST SERVICE No.	: 0634/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Subatmospheric Pressure Sampling
SAMPLING DATE	: 01-02/04/2024	ANALYTICAL DATE	: 04/04/2024
SAMPLING TIME	: 15:09-15:00	SAMPLE CONDITION	: Normal
RECEIVED DATE	: 03/04/2024	FILE CODE	: 224010_TO-15_April
REPORT DATE	: 18/04/2024		

Compound	Non Detection		SAMPLING LOCATION		STANDARD* (µg/m ³)
			Takuan-Ao Pradu Community 1		
	ppbv	µg/m ³	ppbv	µg/m ³	
Benzene	0.004	0.013	0.24	0.77	7.6

Method for the Determination of Toxic Organic Compound in Ambient Air, 2nd ed., EPA Methods TO-15, 1999

Siriwan Chimsa-nga
(Miss Siriwan Chimsa-nga)

Analyst

MTZ
(Mrs. Anya Tipparak)

Technical Management Team

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R:\Database\Windrose\FileControl\Win-224010-Takuan-Ao pradu Community 1 01-02 Apr 2024



Meteorological Monitoring Results : Wind Rose
MTR-PTTGC6-Refinery

Location : Takuan-Ao pradu Community 1

Monitor period : 01-02 Apr 2024

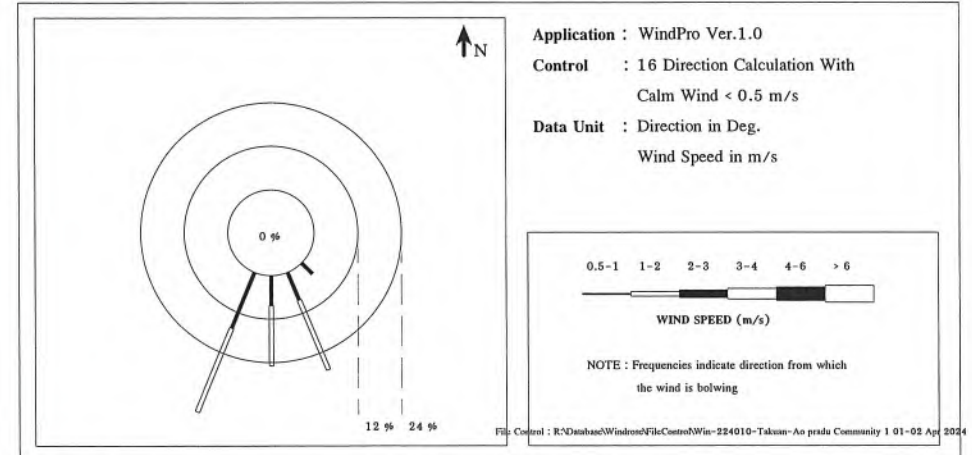
Wind Speed Model : NRG Symphonie

Serial No : 309019737

Wind Direction Model : NRG Symphonie

Serial No : 309019737

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NNE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ENE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
E	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ESE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SE	0.0417	0.0000	0.0000	0.0000	0.0000	0.0000	0.0417
SSE	0.0833	0.2083	0.0000	0.0000	0.0000	0.0000	0.2917
S	0.0833	0.1667	0.0000	0.0000	0.0000	0.0000	0.2500
SSW	0.1667	0.2500	0.0000	0.0000	0.0000	0.0000	0.4167
SW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
WSW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
W	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
WNW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NNW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CALM	0.0000						



(Miss Katesarin Vorradetwittaya)
Environmental Scientist

Preeda S.
(Miss Preeda Somjai)
Technical Management Team



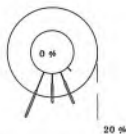
Meteorological Monitoring Results : Wind Rose

MTR-PTTGC6-Refinery

Location : Takuan-Ao pradu Community 1 Monitor period : 01-02 Apr 2024
 Wind Speed Model : NRG Symphonie Serial No : 309019737
 Wind Direction Model : NRG Symphonie Serial No : 309019737

Time	01-02 Apr 2024	
	WS(m/s)	WD
14:00 - 15:00	1.5	S
15:00 - 16:00	1.4	SSW
16:00 - 17:00	1.4	SSE
17:00 - 18:00	0.8	SSE
18:00 - 19:00	0.7	SE
19:00 - 20:00	1.0	SSE
20:00 - 21:00	0.8	SSW
21:00 - 22:00	0.8	SSE
22:00 - 23:00	1.0	SSW
23:00 - 24:00	1.1	SSW
00:00 - 01:00	1.1	S
01:00 - 02:00	1.1	S
02:00 - 03:00	0.9	SSW
03:00 - 04:00	0.9	S
04:00 - 05:00	0.9	SSW
05:00 - 06:00	0.6	S
06:00 - 07:00	1.0	SSW
07:00 - 08:00	1.8	SSW
08:00 - 09:00	1.6	SSW
09:00 - 10:00	1.1	S
10:00 - 11:00	0.9	SSW
11:00 - 12:00	1.4	SSE
12:00 - 13:00	1.7	SSE
13:00 - 14:00	1.4	SSE

Wind Rose



0.5-1 1-2 2-3 3-4 4-6 >= 6
 WIND SPEED (m/s) - Scale 1:3

(Miss Katesarin Vorradetwittaya)
 Environmental Scientist

(Miss Preeda Somjai)
 Technical Management Team



บริษัท ซีคอต จำกัด

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

AMBIENT AIR QUALITY ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Co., Ltd, Branch 6 REQUEST SERVICE No. : 0634/67
 (Refinery GC 6) SAMPLING METHOD : Subatmospheric Pressure Sampling
 SAMPLING BY : SECOT Co., Ltd. ANALYTICAL DATE : 04/04/2024
 SAMPLING DATE : 01-02/04/2024 SAMPLE CONDITION : Normal
 RECEIVED DATE : 03/04/2024 FILE CODE : 224010_TO-15_April
 REPORT DATE : 18/04/2024

Compound	SAMPLING LOCATION				STANDARD* (µg/m ³)
	Non Detection		Takuan-Ao Pradu Community 2		
	ppbv	µg/m ³	ppbv	µg/m ³	
Benzene	0.004	0.013	0.07	0.22	7.6

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

(Miss Sirivan Chimsa-nga)

Analyst

(Mrs. Araya Tipparuk)

Technical Management Team

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File Control : R:\Database\Windrose\FileControl\Win-224010-Takuan-Ao pradu Community 1 01-02 Apr 2024



Meteorological Monitoring Results : Wind Rose

MTR-PTTGC6-Refinery

Location : Takuan-Ao pradu Community 2

Monitor period : 01-02 Apr 2024

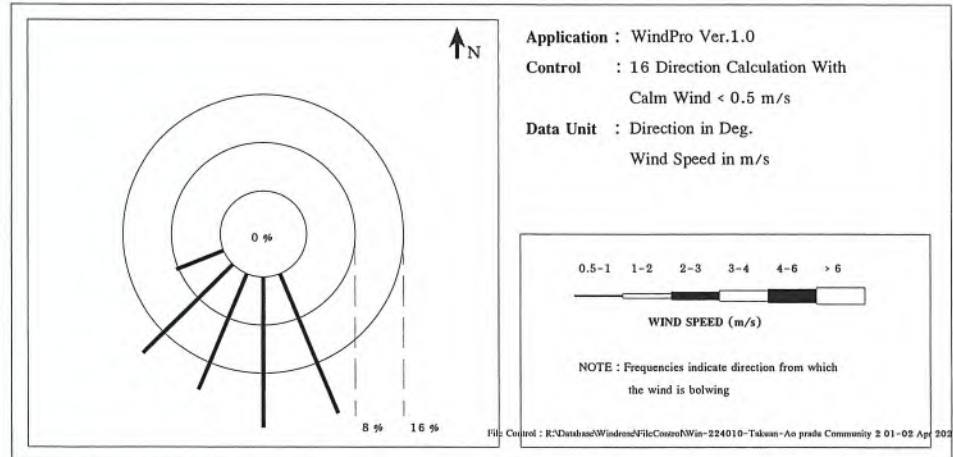
Wind Speed Model : NRG Symphonie

Serial No : 309012643

Wind Direction Model : NRG Symphonie

Serial No : 309012643

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NNE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ENE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
E	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ESE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SSE	0.2500	0.0000	0.0000	0.0000	0.0000	0.0000	0.2500
S	0.2500	0.0000	0.0000	0.0000	0.0000	0.0000	0.2500
SSW	0.2083	0.0000	0.0000	0.0000	0.0000	0.0000	0.2083
SW	0.2083	0.0000	0.0000	0.0000	0.0000	0.0000	0.2083
WSW	0.0833	0.0000	0.0000	0.0000	0.0000	0.0000	0.0833
W	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
WNW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NNW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CALM	0.0000						



(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose

MTR-PTTGC6-Refinery

Location : Takuan-Ao pradu Community 2

Monitor period : 01-02 Apr 2024

Wind Speed Model : NRG Symphonie

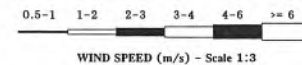
Serial No : 309012643

Wind Direction Model : NRG Symphonie

Serial No : 309012643

Time	01-02 Apr 2024	
	WS(m/s)	WD
14:00 - 15:00	0.6	SSW
15:00 - 16:00	0.6	SSW
16:00 - 17:00	0.5	S
17:00 - 18:00	0.6	SSE
18:00 - 19:00	0.6	SSE
19:00 - 20:00	0.7	SSE
20:00 - 21:00	0.5	SSE
21:00 - 22:00	0.6	S
22:00 - 23:00	0.5	SSW
23:00 - 24:00	0.6	SSW
00:00 - 01:00	0.6	WSW
01:00 - 02:00	0.5	SSE
02:00 - 03:00	0.5	SW
03:00 - 04:00	0.5	SW
04:00 - 05:00	0.5	SW
05:00 - 06:00	0.5	SW
06:00 - 07:00	0.5	WSW
07:00 - 08:00	0.6	SSW
08:00 - 09:00	0.7	SW
09:00 - 10:00	0.6	SSE
10:00 - 11:00	0.7	S
11:00 - 12:00	0.8	S
12:00 - 13:00	0.9	S
13:00 - 14:00	0.8	S

Wind Rose



(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



บริษัท ซีคอต จำกัด SECOT CO., LTD.

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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
TEL. (662) 959-3600 FAX (662) 959-3535 Website : secot.co.th E-mail : envserv@secot.co.th

AMBIENT AIR QUALITY ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical Public Co., Ltd, Branch 6 (Refinery GC 6)	REQUEST SERVICE No.	: 0957/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Subatmospheric Pressure Sampling
SAMPLING DATE	: 15-16/05/2024	ANALYTICAL DATE	: 23/05/2024
SAMPLING TIME	: 13:40-14:16	SAMPLE CONDITION	: Normal
RECEIVED DATE	: 17/05/2024	FILE CODE	: 224010_TO-15_May
REPORT DATE	: 24/05/2024		

Compound	Non Detection		SAMPLING LOCATION		STANDARD* ($\mu\text{g}/\text{m}^3$)
			Takuan-Ao Pradu Community 1		
	ppbv	$\mu\text{g}/\text{m}^3$	ppbv	$\mu\text{g}/\text{m}^3$	
Benzene	0.004	0.013	0.68	2.17	7.6

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

Siriwan Chimsanaga

(Miss Siriwan Chimsan-nga)

Analyst

Araya Tipparak

(Mrs. Araya Tipparak)

Technical Management Team

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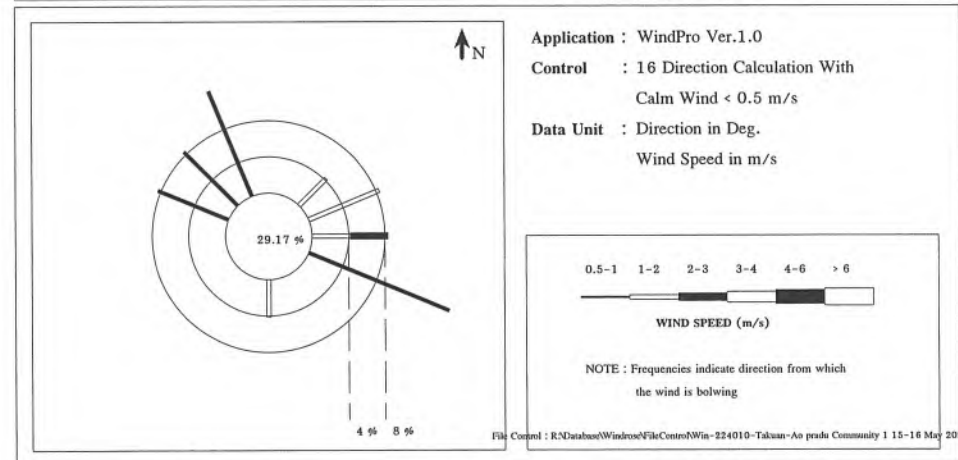
R:\Database\Windrose\FileControllWin-224010-Takuan-Ao pradu Community 1 15-16 May 2024



Meteorological Monitoring Results : Wind Rose MTR-PTTGC6-Refinery

Location : Takuan-Ao pradu Community 1 Monitor period : 15-16 May 2024
Wind Speed Model : Novalynx WS-25 Serial No : A4905
Wind Direction Model : Novalynx WS-25 Serial No : A4905

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NNE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NE	0.0000	0.0417	0.0000	0.0000	0.0000	0.0000	0.0417
ENE	0.0000	0.0833	0.0000	0.0000	0.0000	0.0000	0.0833
E	0.0000	0.0417	0.0417	0.0000	0.0000	0.0000	0.0833
ESE	0.1667	0.0000	0.0000	0.0000	0.0000	0.0000	0.1667
SE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SSE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
S	0.0000	0.0417	0.0000	0.0000	0.0000	0.0000	0.0417
SSW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
WSW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
W	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
WNW	0.0833	0.0000	0.0000	0.0000	0.0000	0.0000	0.0833
NW	0.0833	0.0000	0.0000	0.0000	0.0000	0.0000	0.0833
NNW	0.1250	0.0000	0.0000	0.0000	0.0000	0.0000	0.1250
CALM	0.2917						



Katesarin Vorradetwittaya

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

Preeda S.

(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose

MTR-PTTGC6-Refinery

Location : Takuan-Ao pradu Community 1 Monitor period : 15-16 May 2024
 Wind Speed Model : Novalynx WS-25 Serial No : A4905
 Wind Direction Model : Novalynx WS-25 Serial No : A4905

Time	15-16 May 2024	
	WS(m/s)	WD
12:00 - 13:00	0.3	E
13:00 - 14:00	1.0	NE
14:00 - 15:00	1.2	E
15:00 - 16:00	1.0	ENE
16:00 - 17:00	0.7	NNW
17:00 - 18:00	0.4	NW
18:00 - 19:00	0.3	NNW
19:00 - 20:00	0.6	NNW
20:00 - 21:00	0.7	NW
21:00 - 22:00	0.4	NW
22:00 - 23:00	0.5	WNW
23:00 - 24:00	0.3	WNW
00:00 - 01:00	0.5	WNW
01:00 - 02:00	0.6	NW
02:00 - 03:00	0.5	NNW
03:00 - 04:00	1.3	ENE
04:00 - 05:00	0.7	ESE
05:00 - 06:00	0.6	ESE
06:00 - 07:00	1.7	S
07:00 - 08:00	0.3	NE
08:00 - 09:00	2.4	E
09:00 - 10:00	0.5	ESE
10:00 - 11:00	0.3	ESE
11:00 - 12:00	0.5	ESE

Wind Rose



0.5-1 1-2 2-3 3-4 4-6 >= 6
 WIND SPEED (m/s) - Scale 1:3

File Control R:\Database\Win\WinControlWin-224010-Takuan-Ao pradu Community 1 15-16 May 2024

(Miss Katesarin Vorradetwittaya)
 Environmental Scientist

Preeda S.
 (Miss Preeda Somjai)
 Technical Management Team



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SECOT CO., LTD.

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AMBIENT AIR QUALITY ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Co., Ltd, Branch 6 REQUEST SERVICE No. : 0957/67
 (Refinery GC 6) SAMPLING METHOD : Subatmospheric Pressure Sampling
 SAMPLING BY : SECOT Co., Ltd. ANALYTICAL DATE : 23/05/2024
 SAMPLING DATE : 15-16/05/2024 SAMPLE CONDITION : Normal
 SAMPLING TIME : 13:26-13:47 FILE CODE : 224010_TO-15_May
 RECEIVED DATE : 17/05/2024
 REPORT DATE : 24/05/2024

Compound	Non Detection		SAMPLING LOCATION		STANDARD* (µg/m ³)
			Takuan-Ao Pradu Community 2		
	ppbv	µg/m ³	ppbv	µg/m ³	
Benzene	0.004	0.013	0.57	1.82	7.6

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

Siriwan Chimsa-nga
 (Miss Siriwan Chimsa-nga)

Analyst

Araya Tipparuk
 (Mrs. Araya Tipparuk)

Technical Management Team

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Meteorological Monitoring Results : Wind Rose

MTR-PTTGC6-Refinery

Location : Takuan-Ao pradu Community 2

Monitor period : 15-16 May 2024

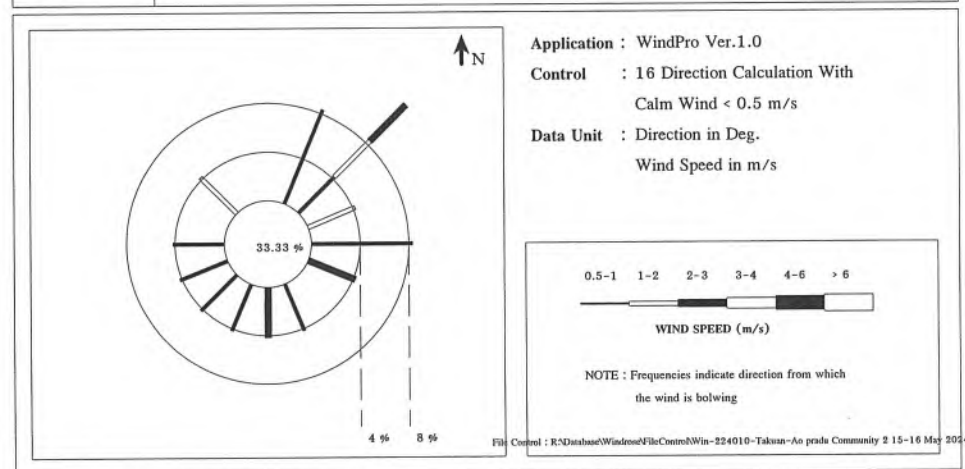
Wind Speed Model : Novalynx WS-25

Serial No : A5090

Wind Direction Model : Novalynx WS-25

Serial No : A5090

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NNE	0.0833	0.0000	0.0000	0.0000	0.0000	0.0000	0.0833
NE	0.0417	0.0417	0.0417	0.0000	0.0000	0.0000	0.1250
ENE	0.0000	0.0417	0.0000	0.0000	0.0000	0.0000	0.0417
E	0.0833	0.0000	0.0000	0.0000	0.0000	0.0000	0.0833
ESE	0.0000	0.0000	0.0417	0.0000	0.0000	0.0000	0.0417
SE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SSE	0.0417	0.0000	0.0000	0.0000	0.0000	0.0000	0.0417
S	0.0000	0.0000	0.0417	0.0000	0.0000	0.0000	0.0417
SSW	0.0417	0.0000	0.0000	0.0000	0.0000	0.0000	0.0417
SW	0.0417	0.0000	0.0000	0.0000	0.0000	0.0000	0.0417
WSW	0.0417	0.0000	0.0000	0.0000	0.0000	0.0000	0.0417
W	0.0417	0.0000	0.0000	0.0000	0.0000	0.0000	0.0417
WNW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NW	0.0000	0.0417	0.0000	0.0000	0.0000	0.0000	0.0417
NNW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CALM	0.3333						



(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose

MTR-PTTGC6-Refinery

Location : Takuan-Ao pradu Community 2

Monitor period : 15-16 May 2024

Wind Speed Model : Novalynx WS-25

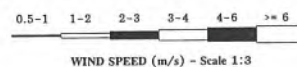
Serial No : A5090

Wind Direction Model : Novalynx WS-25

Serial No : A5090

Time	15-16 May 2024	
	WS(m/s)	WD
12:00 - 13:00	0.5	SSW
13:00 - 14:00	0.5	W
14:00 - 15:00	0.3	WSW
15:00 - 16:00	0.4	W
16:00 - 17:00	2.5	ESE
17:00 - 18:00	1.6	ENE
18:00 - 19:00	0.9	E
19:00 - 20:00	0.3	E
20:00 - 21:00	0.3	E
21:00 - 22:00	2.1	NE
22:00 - 23:00	0.4	NNE
23:00 - 24:00	0.6	NNE
00:00 - 01:00	0.5	NE
01:00 - 02:00	0.6	E
02:00 - 03:00	0.3	NNE
03:00 - 04:00	2.4	S
04:00 - 05:00	0.6	SSE
05:00 - 06:00	1.7	NE
06:00 - 07:00	0.3	NNE
07:00 - 08:00	0.6	NNE
08:00 - 09:00	0.9	SW
09:00 - 10:00	0.3	WSW
10:00 - 11:00	0.5	WSW
11:00 - 12:00	1.0	NW

Wind Rose



File Control : R:\Database\Windrose\FileControl\Win-224010-Takuan-Ao pradu Community 2 15-16 May 2024

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



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SECOT CO., LTD.

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AMBIENT AIR QUALITY ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical Public Co., Ltd, Branch 6	REQUEST SERVICE No.	: 1165/67
	(Refinery GC 6)	SAMPLING METHOD	: Subatmospheric Pressure Sampling
SAMPLING BY	: SECOT Co., Ltd.	ANALYTICAL DATE	: 15/06/2024
SAMPLING DATE	: 06-07/06/2024	SAMPLE CONDITION	: Normal
SAMPLING TIME	: 12:14-13:14	FILE CODE	: 224010_TO-15_June
RECEIVED DATE	: 08/06/2024		
REPORT DATE	: 21/06/2024		

Compound	Non Detection		SAMPLING LOCATION		STANDARD* (µg/m ³)
			Takuan-Ao Pradu Community 1		
	ppbv	µg/m ³	ppbv	µg/m ³	
Benzene	0.004	0.013	1.34	4.28	7.6

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

Siriwan Chimsa-nga

(Miss Siriwan Chimsa-nga)

Analyst

(Mrs. Araya Tipparuk)

Technical Management Team

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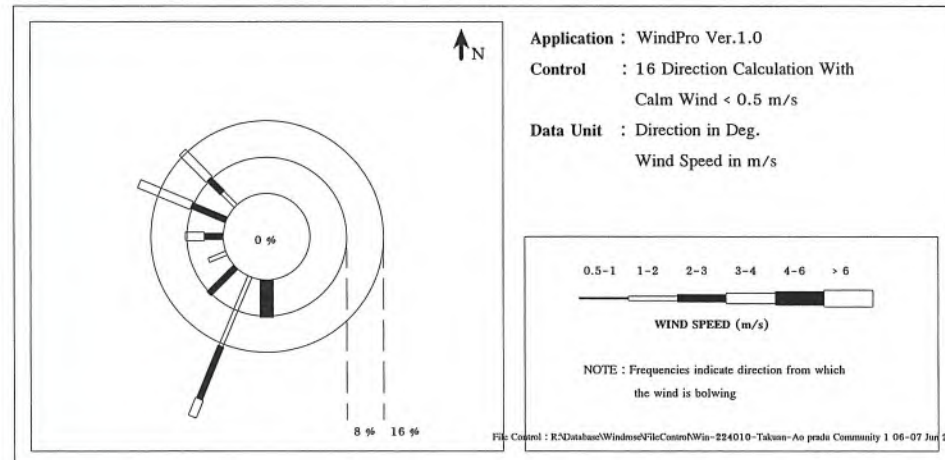
R:\Database\Windrose\FileControl\Win-224010-Takuan-Ao pradu Community 1 06-07 Jun 2024



Meteorological Monitoring Results : Wind Rose
MTR-PTTGC6-Refinery

Location : Takuan-Ao pradu Community 1	Monitor period : 06-07 Jun 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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NNE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ENE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
E	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ESE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SSE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
S	0.0000	0.0000	0.0000	0.0000	0.0833	0.0000	0.0833
SSW	0.0000	0.1667	0.1250	0.0417	0.0000	0.0000	0.3333
SW	0.0000	0.0000	0.0833	0.0000	0.0000	0.0000	0.0833
WSW	0.0000	0.0417	0.0000	0.0000	0.0000	0.0000	0.0417
W	0.0000	0.0000	0.0417	0.0417	0.0000	0.0000	0.0833
WNW	0.0000	0.0000	0.0833	0.1250	0.0000	0.0000	0.2083
NW	0.0000	0.0417	0.0417	0.0833	0.0000	0.0000	0.1667
NNW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CALM	0.0000						



(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



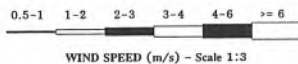
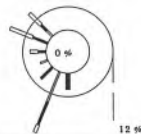
Meteorological Monitoring Results : Wind Rose

MTR-PTTGC6-Refinery

Location : Takuan-Ao pradu Community 1 Monitor period : 06-07 Jun 2024
 Wind Speed Model : Novalynx WS-25 Serial No : A5092
 Wind Direction Model : Novalynx WS-25 Serial No : A5092

Time	06-07 Jun 2024	
	WS(m/s)	WD
12:00 - 13:00	2.1	SSW
13:00 - 14:00	4.0	S
14:00 - 15:00	3.6	SSW
15:00 - 16:00	1.3	SSW
16:00 - 17:00	1.9	SSW
17:00 - 18:00	1.8	SSW
18:00 - 19:00	2.0	SW
19:00 - 20:00	2.0	SW
20:00 - 21:00	2.7	SSW
21:00 - 22:00	3.1	NW
22:00 - 23:00	1.9	WSW
23:00 - 24:00	3.6	WNW
00:00 - 01:00	3.5	W
01:00 - 02:00	3.9	NW
02:00 - 03:00	3.5	WNW
03:00 - 04:00	2.5	NW
04:00 - 05:00	1.4	NW
05:00 - 06:00	2.0	WNW
06:00 - 07:00	2.5	WNW
07:00 - 08:00	1.6	SSW
08:00 - 09:00	2.2	W
09:00 - 10:00	4.3	S
10:00 - 11:00	2.7	SSW
11:00 - 12:00	3.5	WNW

Wind Rose



File Control : R:\Database\Windrose\FireControl\Win-224010-Takuan-Ao pradu Community 1 06-07 Jun 2024

(Miss Katesarin Vorradetwittaya)
 Environmental Scientist

(Miss Preeda Somjai)
 Technical Management Team



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AMBIENT AIR QUALITY ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical Public Co., Ltd, Branch 6	REQUEST SERVICE No.	: 1165/67
	(Refinery GC 6)	SAMPLING METHOD	: Subatmospheric Pressure Sampling
SAMPLING BY	: SECOT Co., Ltd.	ANALYTICAL DATE	: 15/06/2024
SAMPLING DATE	: 06-07/06/2024	SAMPLE CONDITION	: Normal
SAMPLING TIME	: 12:04-13:04	FILE CODE	: 224010_TO-15_June
RECEIVED DATE	: 08/06/2024		
REPORT DATE	: 21/06/2024		

Compound	Non Detection		SAMPLING LOCATION		STANDARD* ($\mu\text{g}/\text{m}^3$)
			Takuan-Ao Pradu Community 2		
	ppbv	$\mu\text{g}/\text{m}^3$	ppbv	$\mu\text{g}/\text{m}^3$	
Benzene	0.004	0.013	0.44	1.41	7.6

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

(Miss Siriwan Chimsa-nga)
 Analyst

(Mrs. Araya Tippasuk)
 Technical Management Team

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Meteorological Monitoring Results : Wind Rose

MTR-PTTGC6-Refinery

Location : Takuan-Ao pradu Community 2

Monitor period : 06-07 Jun 2024

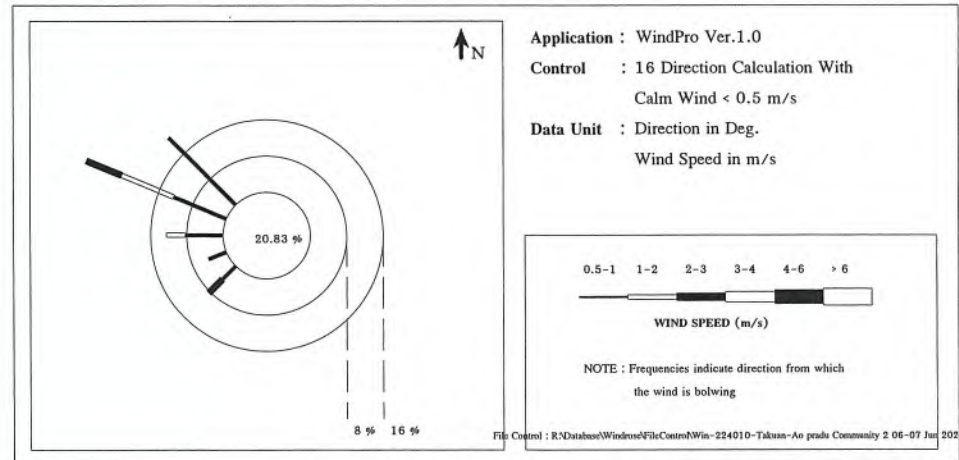
Wind Speed Model : NRG Symphonie

Serial No : 309016055

Wind Direction Model : NRG Symphonie

Serial No : 309016055

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NNE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ENE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
E	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ESE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SSE	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
S	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SSW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SW	0.0417	0.0000	0.0417	0.0000	0.0000	0.0000	0.0833
WSW	0.0417	0.0000	0.0000	0.0000	0.0000	0.0000	0.0417
W	0.0833	0.0417	0.0000	0.0000	0.0000	0.0000	0.1250
WNW	0.1250	0.1250	0.0833	0.0000	0.0000	0.0000	0.3333
NW	0.2083	0.0000	0.0000	0.0000	0.0000	0.0000	0.2083
NNW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CALM	0.2083						



(Miss Katesarin Vorradetwittaya)
Environmental Scientist

Preeda S.
(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose

MTR-PTTGC6-Refinery

Location : Takuan-Ao pradu Community 2

Monitor period : 06-07 Jun 2024

Wind Speed Model : NRG Symphonie

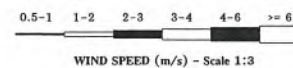
Serial No : 309016055

Wind Direction Model : NRG Symphonie

Serial No : 309016055

Time	06-07 Jun 2024	
	WS(m/s)	WD
11:00 - 12:00	0.5	NW
12:00 - 13:00	1.2	WNW
13:00 - 14:00	2.2	SW
14:00 - 15:00	0.6	W
15:00 - 16:00	0.4	SW
16:00 - 17:00	1.8	WNW
17:00 - 18:00	2.2	WNW
18:00 - 19:00	0.5	SW
19:00 - 20:00	1.1	W
20:00 - 21:00	0.4	N
21:00 - 22:00	0.6	NW
22:00 - 23:00	0.5	WNW
23:00 - 24:00	0.4	WNW
00:00 - 01:00	0.5	WNW
01:00 - 02:00	0.5	WNW
02:00 - 03:00	0.4	NW
03:00 - 04:00	2.1	WNW
04:00 - 05:00	0.5	NW
05:00 - 06:00	0.5	NW
06:00 - 07:00	0.3	WNW
07:00 - 08:00	0.5	NW
08:00 - 09:00	0.5	W
09:00 - 10:00	1.0	WNW
10:00 - 11:00	0.6	WSW

Wind Rose



(Miss Katesarin Vorradetwittaya)
Environmental Scientist

Preeda S.
(Miss Preeda Somjai)
Technical Management Team



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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. : PTTGC6 (Refinery)_224010_Cert-Amb/TSP (May24)
Branch 6 (Refinery) SAMPLING DATE : 11-18/05/2024
SAMPLING BY : SECOT Co., Ltd. ANALYTICAL DATE : 21-23/05/2024
RECEIVED DATE : 21/05/2024 SAMPLE CONDITION : Normal
REPORT DATE : 29/05/2024 SITE OPERATOR : Mr. Siwanon Kulawong
LOCATION DESCRIPTION : 1. North of Refinery Area 3. Takuan-Ao Pradu Community 1
2. North of VCU Area 4. Takuan-Ao Pradu Community 2

PARAMETER	SAMPLING DATE	UNITS	RESULTS				STANDARD*	REFERENCE METHOD
			1	2	3	4		
TSP (24 hr)	11-12/05/2024	mg/m ³	0.050	0.060	0.073	0.061	0.330	High Volume Air
	12-13/05/2024	mg/m ³	0.046	0.056	0.057	0.069		Sampler / Gravimetric
	13-14/05/2024	mg/m ³	0.037	0.053	0.075	0.044		Method
	14-15/05/2024	mg/m ³	0.070	0.062	0.049	0.058		
	15-16/05/2024	mg/m ³	0.047	0.051	0.056	0.079		
	16-17/05/2024	mg/m ³	0.036	0.050	0.056	0.066		
	17-18/05/2024	mg/m ³	0.030	0.062	0.045	0.073		

Phatchara Samanchan
(Miss Phatchara Samanchan)
Analyst

Narisa Poowasanpetch
(Miss Narisa Poowasanpetch)
Technical Management Team

- Remark : 1. Reported analysis refers to submitted sample only.
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3. * Notification of the National Environment Board, No.24, B.E.2547 (2004).



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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. : PTTGC6 (Refinery)_224010_Cert-Amb/PM-10 (May24)
Branch 6 (Refinery) SAMPLING DATE : 11-18/05/2024
SAMPLING BY : SECOT Co., Ltd. ANALYTICAL DATE : 21-23/05/2024
RECEIVED DATE : 21/05/2024 SAMPLE CONDITION : Normal
REPORT DATE : 29/05/2024 SITE OPERATOR : Mr. Siwanon Kulawong
LOCATION DESCRIPTION : 1. North of Refinery Area 3. Takuan-Ao Pradu Community 1
2. North of VCU Area 4. Takuan-Ao Pradu Community 2

PARAMETER	SAMPLING DATE	UNITS	RESULTS				STANDARD*	REFERENCE METHOD
			1	2	3	4		
PM-10 (24 hr)	11-12/05/2024	mg/m ³	0.042	0.044	0.034	0.057	0.120	High Volume
	12-13/05/2024	mg/m ³	0.031	0.040	0.043	0.048		Air Sampler
	13-14/05/2024	mg/m ³	0.029	0.042	0.048	0.039		(Hi-Vol. PM-10 Size
	14-15/05/2024	mg/m ³	0.043	0.034	0.036	0.054		Selective Inlet) /
	15-16/05/2024	mg/m ³	0.036	0.034	0.033	0.065		Gravimetric Method
	16-17/05/2024	mg/m ³	0.033	0.043	0.037	0.060		
	17-18/05/2024	mg/m ³	0.019	0.021	0.026	0.044		

Phatchara Samanchan
(Miss Phatchara Samanchan)
Analyst

Narisa Poowasanpetch
(Miss Narisa Poowasanpetch)
Technical Management Team

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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. : PTTGC6 (Refinery)_224010_Cert-Amb/THC (May24)
Branch 6 (Refinery) SAMPLING DATE : 11-17/05/2024
SAMPLING BY : SECOT Co., Ltd. ANALYTICAL DATE : 28/05/2024
RECEIVED DATE : 21/05/2024 SAMPLE CONDITION : Normal
REPORT DATE : 04/06/2024 SITE OPERATOR : Mr. Siwanon Kulawong
LOCATION DESCRIPTION : 1. North of Refinery Area 3. Takuan-Ao Pradu Community 1
2. North of VCU Area 4. Takuan-Ao Pradu Community 2

PARAMETER	SAMPLING DATE	UNITS	ND Non-detectable	RESULTS				REFERENCE METHOD
				1	2	3	4	
Total Hydrocarbon	11/05/2024	ppm	<0.10	3.01	4.95	4.18	3.93	Flame Ionization
(THC)	12/05/2024	ppm	<0.10	3.45	3.95	3.84	6.11	Detection Method
	13/05/2024	ppm	<0.10	4.60	4.78	5.10	4.57	
	14/05/2024	ppm	<0.10	3.20	3.33	4.18	3.12	
	15/05/2024	ppm	<0.10	5.18	4.50	4.11	3.95	
	16/05/2024	ppm	<0.10	5.19	4.83	2.92	5.24	
	17/05/2024	ppm	<0.10	6.21	3.51	3.10	2.79	

Sudaporn S.
(Miss Sudaporn Soonthorn)
Analyst

Narisa Poowasanpetch
(Miss Narisa Poowasanpetch)
Technical Management Team

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AMBIENT AIR QUALITY ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Co., Ltd. REFERENCE NO. : PTTGC6 (Refinery)_224010_Cert-Amb/NMHC (May24)
Branch 6 (Refinery) SAMPLING DATE : 11-17/05/2024
SAMPLING BY : SECOT Co., Ltd. ANALYTICAL DATE : 28/05/2024
RECEIVED DATE : 21/05/2024 SAMPLE CONDITION : Normal
REPORT DATE : 04/06/2024 SITE OPERATOR : Mr. Siwanon Kulawong
LOCATION DESCRIPTION : 1. North of Refinery Area 3. Takuan-Ao Pradu Community 1
2. North of VCU Area 4. Takuan-Ao Pradu Community 2

PARAMETER	SAMPLING DATE	UNITS	ND Non-detectable	RESULTS				REFERENCE METHOD
				1	2	3	4	
Non-methane	11/05/2024	ppm	<0.05	0.05	0.05	0.05	0.05	Flame Ionization
Hydrocarbon	12/05/2024	ppm	<0.05	0.06	0.05	0.08	0.08	Detection Method
(NMHC)	13/05/2024	ppm	<0.05	0.05	0.05	0.05	0.06	
	14/05/2024	ppm	<0.05	0.05	0.05	0.06	0.07	
	15/05/2024	ppm	<0.05	0.06	0.06	0.06	0.06	
	16/05/2024	ppm	<0.05	0.07	0.06	0.05	0.07	
	17/05/2024	ppm	<0.05	0.07	0.05	0.07	0.05	

Sudaporn S.
(Miss Sudaporn Soonthorn)
Analyst

Narisa Poowasanpetch
(Miss Narisa Poowasanpetch)
Technical Management Team

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AMBIENT AIR QUALITY ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Co., Ltd. REFERENCE NO. : PTTGC6 (Refinery)_224010_Cert-Amb/H₂S (May24)
Branch 6 (Refinery) SAMPLING DATE : 11-17/05/2024
SAMPLING BY : SECOT Co., Ltd. ANALYTICAL DATE : 23/05/2024
RECEIVED DATE : 21/05/2024 SAMPLE CONDITION : Normal
REPORT DATE : 04/06/2024 SITE OPERATOR : Mr. Siwanon Kulawong
INSTRUMENT : Impingment Absorption
LOCATION DESCRIPTION : 1. North of Refinery Area 3. Takuan-Ao Pradu Community 1
2. North of VCU Area 4. Takuan-Ao Pradu Community 2

PARAMETER	SAMPLING DATE	UNITS	ND	RESULTS				REFERENCE METHOD
			Non-detectable	1	2	3	4	
Hydrogen Sulfide (H ₂ S)	11/05/2024	ppm	<0.001	ND	ND	ND	ND	Intersociety Committee
	12/05/2024	ppm	<0.001	ND	ND	ND	ND	Method 701
	13/05/2024	ppm	<0.001	ND	ND	ND	ND	
	14/05/2024	ppm	<0.001	ND	ND	ND	ND	
	15/05/2024	ppm	<0.001	ND	ND	ND	ND	
	16/05/2024	ppm	<0.001	ND	ND	ND	ND	
	17/05/2024	ppm	<0.001	ND	ND	ND	ND	

Phatchara Samanchan
(Miss Phatchara Samanchan)

Analyst

Miss Narisa Poowasanpetch
(Miss Narisa Poowasanpetch)

Technical Management Team

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

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R:\Database\Ambient\FileControl\Amb-224010-North of Refinery Area-NO2 11-18 May 2024



Ambient Air Monitoring Results : Nitrogen dioxide
MTR-PTTGC6-Refinery

Location : North of Refinery Area Monitor Period : 11-18 May 2024
Analyzer Model : Teledyne T200 Station No : Mobile 10
Serial No : 110 Site Operator : Mr. Siwanon Kulawong

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	NO2 Concentration (ppb)						
	11-12 May 2024	12-13 May 2024	13-14 May 2024	14-15 May 2024	15-16 May 2024	16-17 May 2024	17-18 May 2024
09:00 - 10:00	9.0	4.4	13.9	9.5	10.9	8.9	10.1
10:00 - 11:00	4.0	4.7	9.1	4.5	7.8	5.4	5.8
11:00 - 12:00	6.2	4.2	12.5	9.8	10.7	8.8	7.9
12:00 - 13:00	5.8	6.7	12.2	5.3	9.3	5.7	11.7
13:00 - 14:00	4.3	10.8	8.3	8.4	14.0	8.1	8.6
14:00 - 15:00	9.3	4.1	9.4	9.8	13.5	10.8	6.9
15:00 - 16:00	8.2	4.9	9.8	7.5	12.0	7.1	11.9
16:00 - 17:00	12.4	11.2	13.7	9.8	12.6	9.9	7.5
17:00 - 18:00	12.9	9.9	13.6	10.1	8.5	6.9	8.2
18:00 - 19:00	11.9	8.8	11.6	9.7	13.8	10.6	2.7
19:00 - 20:00	13.9	10.9	12.8	13.5	12.5	2.5	12.2
20:00 - 21:00	12.3	9.5	13.3	12.2	2.4	12.3	11.4
21:00 - 22:00	11.8	12.1	8.5	2.5	10.1	7.6	11.1
22:00 - 23:00	9.5	8.5	3.9	13.8	7.0	9.6	9.4
23:00 - 00:00	8.6	2.8	9.2	13.9	9.2	5.8	10.9
00:00 - 01:00	3.9	6.8	10.7	12.6	8.4	3.4	11.8
01:00 - 02:00	3.2	3.3	4.1	2.6	3.0	4.1	4.4
02:00 - 03:00	6.1	4.0	9.8	10.4	5.3	5.8	6.6
03:00 - 04:00	4.3	4.7	4.2	8.7	4.3	5.9	6.8
04:00 - 05:00	4.7	5.0	5.9	10.7	5.0	4.4	4.9
05:00 - 06:00	6.0	8.2	4.7	9.8	10.7	5.5	6.3
06:00 - 07:00	4.0	9.3	11.5	9.5	11.8	10.1	5.3
07:00 - 08:00	6.3	8.8	7.0	10.9	11.3	12.5	6.5
08:00 - 09:00	3.9	8.8	6.5	8.7	8.1	11.7	4.7
Average-24Hr*	7.6	7.2	9.4	9.3	9.3	7.6	8.1
Max-1Hr	13.9	12.1	13.9	13.9	14.0	12.5	12.2
Min-1Hr	3.2	2.8	3.9	2.5	2.4	2.5	2.7
Standard-1Hr	170 ppb(320 ug/cu.m)						
Standard-24Hr	-						

Remark : * Average time between 09:00-09:00

Miss Katesarin Vorradetwittaya
Environmental Scientist

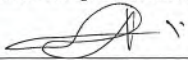
Preeda S.
(Miss Preeda Somjai)
Technical Management Team




Ambient Air Monitoring Results : Nitrogen dioxide MTR-PTTGC6-Refinery

Location : North of VCU Area				Monitor Period : 11-18 May 2024			
Analyzer Model : API 200A				Station No : Shelter 19			
Serial No : 1505				Site Operator : Mr. Siwanon Kulawong			
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 (ppb)						
	11-12 May 2024	12-13 May 2024	13-14 May 2024	14-15 May 2024	15-16 May 2024	16-17 May 2024	17-18 May 2024
09:00 - 10:00	11.8	6.6	12.9	9.7	11.9	11.1	9.1
10:00 - 11:00	5.6	5.1	10.4	6.6	13.0	6.3	6.0
11:00 - 12:00	5.9	5.9	13.9	10.8	8.1	12.9	13.1
12:00 - 13:00	7.1	12.4	14.5	6.0	10.1	6.1	11.7
13:00 - 14:00	5.2	11.1	7.8	8.9	13.1	9.9	8.6
14:00 - 15:00	9.4	6.0	9.9	11.6	13.2	9.2	6.8
15:00 - 16:00	12.4	5.5	9.9	9.5	13.6	11.3	9.6
16:00 - 17:00	14.4	9.0	14.2	11.4	15.2	10.2	12.9
17:00 - 18:00	14.0	9.3	13.3	12.4	12.2	8.3	10.1
18:00 - 19:00	13.3	8.0	13.7	10.7	14.3	12.2	5.9
19:00 - 20:00	14.6	8.7	15.1	13.7	13.7	5.4	14.6
20:00 - 21:00	12.4	11.9	13.9	14.5	4.2	13.8	8.6
21:00 - 22:00	12.7	13.5	11.2	3.6	9.1	12.9	11.0
22:00 - 23:00	10.8	8.1	4.3	14.5	11.9	10.0	10.8
23:00 - 00:00	9.9	4.3	11.3	15.1	11.0	6.3	9.7
00:00 - 01:00	4.4	8.9	11.8	14.0	11.3	5.4	9.0
01:00 - 02:00	3.4	4.4	3.9	5.0	3.8	4.0	4.0
02:00 - 03:00	6.7	3.9	9.2	10.6	6.2	6.9	7.4
03:00 - 04:00	6.5	6.6	6.0	9.2	6.3	7.3	6.9
04:00 - 05:00	6.8	6.0	5.7	11.2	6.4	6.2	6.5
05:00 - 06:00	6.4	7.8	6.9	11.7	11.2	7.0	7.3
06:00 - 07:00	6.5	12.0	7.8	11.3	10.2	13.1	7.5
07:00 - 08:00	5.9	9.6	12.5	8.7	10.8	15.1	6.3
08:00 - 09:00	5.9	10.7	7.8	8.8	8.2	11.3	6.3
Average-24Hr*	8.8	8.1	10.3	10.4	10.4	9.3	8.7
Max-1Hr	14.6	13.5	15.1	15.1	15.2	15.1	14.6
Min-1Hr	3.4	3.9	3.9	3.6	3.8	4.0	4.0
Standard-1Hr	170 ppb(320 ug/cu.m)						
Standard-24Hr	-						

Remark : * Average time between 09:00-09:00


(Miss Katesarin Vorradetwittaya)
Environmental Scientist



(Miss Preeda Somjai)
Technical Management Team

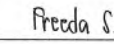


Ambient Air Monitoring Results : Nitrogen dioxide MTR-PTTGC6-Refinery

Location : Takuan-Ao Pradu Community 1				Monitor Period : 11-18 May 2024			
Analyzer Model : API 200A				Station No : SCT-15			
Serial No : 074				Site Operator : Mr. Siwanon Kulawong			
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 (ppb)						
	11-12 May 2024	12-13 May 2024	13-14 May 2024	14-15 May 2024	15-16 May 2024	16-17 May 2024	17-18 May 2024
12:00 - 13:00	4.7	5.2	10.5	3.6	8.2	4.8	10.7
13:00 - 14:00	4.3	5.5	5.4	10.3	10.9	8.2	10.9
14:00 - 15:00	7.5	3.9	7.9	6.1	12.0	8.9	5.2
15:00 - 16:00	7.4	4.5	5.5	6.9	12.2	8.6	10.6
16:00 - 17:00	11.5	8.4	12.5	6.0	12.3	7.9	10.9
17:00 - 18:00	10.1	5.7	11.3	6.0	6.5	10.1	10.5
18:00 - 19:00	11.3	5.2	11.5	9.7	12.6	10.4	2.2
19:00 - 20:00	12.0	9.3	10.6	12.6	12.5	1.7	13.2
20:00 - 21:00	12.0	8.7	10.5	12.8	1.7	11.9	10.8
21:00 - 22:00	10.2	11.7	7.5	1.3	8.7	7.3	11.1
22:00 - 23:00	5.0	6.2	1.5	11.0	9.4	8.8	7.4
23:00 - 00:00	5.4	1.4	8.3	11.8	6.6	5.8	7.2
00:00 - 01:00	2.1	7.0	6.6	12.5	8.1	2.3	9.1
01:00 - 02:00	2.1	2.5	2.3	2.4	3.2	3.3	2.6
02:00 - 03:00	3.8	2.4	5.8	6.7	5.3	5.9	3.7
03:00 - 04:00	4.0	2.6	5.1	10.4	3.8	4.2	6.0
04:00 - 05:00	3.9	2.7	4.5	7.2	4.1	6.0	4.6
05:00 - 06:00	4.4	6.4	3.2	6.6	10.6	6.0	4.4
06:00 - 07:00	3.5	8.2	6.2	8.2	9.2	6.0	5.9
07:00 - 08:00	4.2	9.2	7.3	7.2	7.4	13.5	4.1
08:00 - 09:00	3.9	7.9	4.5	7.6	7.0	10.7	4.0
09:00 - 10:00	4.6	11.7	9.2	10.1	8.7	9.5	4.3
10:00 - 11:00	4.3	8.7	5.1	7.7	4.4	4.6	5.5
11:00 - 12:00	3.4	10.8	5.6	7.6	7.9	9.0	5.4
Average-24Hr*	6.1	6.5	7.0	8.0	8.1	7.3	7.1
Max-1Hr	12.0	11.7	12.5	12.8	12.6	13.5	13.2
Min-1Hr	2.1	1.4	1.5	1.3	1.7	1.7	2.2
Standard-1Hr	170 ppb(320 ug/cu.m)						
Standard-24Hr	-						

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


(Miss Katesarin Vorradetwittaya)
Environmental Scientist


(Miss Preeda Somjai)
Technical Management Team



Ambient Air Monitoring Results : Nitrogen dioxide MTR-PTTGC6-Refinery

Location : Takuan-Ao Pradu Community 2 Monitor Period : 11-18 May 2024
Analyzer Model : API 200A Station No : SCT-16
Serial No : 2384 Site Operator : Mr. Siwanon Kulawong

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 (ppb)						
	11-12 May 2024	12-13 May 2024	13-14 May 2024	14-15 May 2024	15-16 May 2024	16-17 May 2024	17-18 May 2024
12:00 - 13:00	4.8	10.6	13.3	4.6	9.2	4.9	9.2
13:00 - 14:00	4.2	10.5	11.1	9.4	12.6	8.1	11.5
14:00 - 15:00	8.2	4.1	8.9	6.5	13.9	9.8	5.5
15:00 - 16:00	7.5	5.4	9.5	7.9	14.0	11.6	11.2
16:00 - 17:00	11.2	7.6	13.1	6.3	13.1	7.1	10.9
17:00 - 18:00	11.5	7.7	12.7	8.6	7.6	11.1	10.0
18:00 - 19:00	11.8	9.5	11.1	8.7	11.8	7.6	4.2
19:00 - 20:00	11.5	8.3	13.3	11.4	12.2	4.1	12.2
20:00 - 21:00	11.4	6.2	13.6	13.3	2.1	11.8	11.3
21:00 - 22:00	12.9	13.4	6.4	3.1	7.5	11.1	7.9
22:00 - 23:00	6.9	10.1	2.9	13.0	10.6	7.2	9.5
23:00 - 00:00	7.6	2.6	11.2	11.5	11.0	5.6	9.1
00:00 - 01:00	3.0	7.2	10.9	12.8	7.9	2.9	11.3
01:00 - 02:00	3.3	2.9	1.8	1.9	3.4	2.9	3.1
02:00 - 03:00	5.7	2.3	8.4	10.0	6.2	4.8	4.4
03:00 - 04:00	5.3	5.2	5.7	6.7	5.3	5.3	6.0
04:00 - 05:00	5.9	4.4	5.0	11.1	5.6	5.7	6.7
05:00 - 06:00	4.4	7.5	4.8	8.2	6.9	5.9	4.5
06:00 - 07:00	4.8	8.2	7.2	7.4	6.9	10.5	6.7
07:00 - 08:00	5.2	9.7	7.1	10.8	10.7	13.5	5.8
08:00 - 09:00	4.3	6.9	4.3	10.4	6.9	9.6	4.7
09:00 - 10:00	4.2	11.1	6.9	11.1	8.9	11.3	6.2
10:00 - 11:00	3.4	7.0	6.2	11.2	4.7	4.3	6.9
11:00 - 12:00	5.0	13.2	8.3	11.3	10.7	11.3	6.0
Average-24Hr*	6.8	7.6	8.5	9.1	8.7	7.8	7.7
Max-1Hr	12.9	13.4	13.6	13.3	14.0	13.5	12.2
Min-1Hr	3.0	2.3	1.8	1.9	2.1	2.9	3.1
Standard-1Hr	170 ppb(320 ug/cu.m)						
Standard-24Hr	-						

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

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

Preeda S.
(Miss Preeda Somjai)
Technical Management Team



Ambient Air Monitoring Results : Sulfur dioxide MTR-PTTGC6-Refinery

Location : North of Refinery Area Monitor Period : 11-18 May 2024
Analyzer Model : API 100A Station No : Mobile 10
Serial No : 347 Site Operator : Mr. Siwanon Kulawong

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 (ppb)						
	11-12 May 2024	12-13 May 2024	13-14 May 2024	14-15 May 2024	15-16 May 2024	16-17 May 2024	17-18 May 2024
09:00 - 10:00	3.4	2.5	3.2	2.8	7.5	13.1	5.8
10:00 - 11:00	2.4	3.5	4.2	2.8	16.0	17.6	9.3
11:00 - 12:00	2.9	3.5	7.7	2.8	19.5	5.1	3.8
12:00 - 13:00	2.9	5.0	20.7	3.8	25.5	3.1	4.8
13:00 - 14:00	3.4	16.0	3.7	8.3	7.5	4.6	5.8
14:00 - 15:00	12.4	13.5	3.2	5.3	5.5	3.1	9.3
15:00 - 16:00	15.4	9.0	3.2	15.3	5.5	2.7	8.8
16:00 - 17:00	2.9	4.1	2.2	7.4	7.5	2.7	12.8
17:00 - 18:00	2.4	3.1	2.2	4.4	3.0	2.7	8.3
18:00 - 19:00	2.4	8.6	2.2	3.4	3.0	2.7	5.3
19:00 - 20:00	2.9	5.1	2.2	2.9	3.0	2.7	3.8
20:00 - 21:00	2.9	5.6	2.2	2.9	2.5	2.7	2.8
21:00 - 22:00	3.4	3.6	2.7	2.9	2.5	2.7	2.8
22:00 - 23:00	3.9	6.1	2.7	2.9	3.0	2.7	2.8
23:00 - 00:00	3.9	3.1	2.7	2.9	2.5	3.2	2.9
00:00 - 01:00	4.5	6.1	2.3	2.9	2.6	2.7	2.9
01:00 - 02:00	4.0	3.1	3.3	2.9	2.6	2.7	2.9
02:00 - 03:00	3.0	2.6	2.8	2.4	2.6	2.7	2.9
03:00 - 04:00	2.5	2.6	3.3	2.4	2.6	3.2	3.4
04:00 - 05:00	3.0	2.1	2.8	2.4	2.6	3.2	2.9
05:00 - 06:00	4.5	2.1	2.3	2.4	3.1	3.2	2.9
06:00 - 07:00	4.0	2.1	2.3	2.9	2.6	3.2	3.4
07:00 - 08:00	4.5	2.1	2.8	3.9	3.6	3.3	3.4
08:00 - 09:00	4.5	2.7	3.3	4.5	4.1	3.3	2.9
Average-24Hr*	4.3	4.9	3.8	4.1	5.9	4.1	4.9
Max-1Hr	15.4	16.0	20.7	15.3	25.5	17.6	12.8
Min-1Hr	2.4	2.1	2.2	2.4	2.5	2.7	2.8
Standard-1Hr	300 ppb(780 ug/cu.m)						
Standard-24Hr	120 ppb(300 ug/cu.m)						

Remark : * Average time between 09:00-09:00

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

Preeda S.
(Miss Preeda Somjai)
Technical Management Team



Ambient Air Monitoring Results : Sulfur dioxide MTR-PTTGC6-Refinery

Location : North of VCU Area Monitor Period : 11-18 May 2024
Analyzer Model : Thermo 43C Station No : Shelter 19
Serial No : 60771-328-2 Site Operator : Mr. Phuwadech Kaewjirakulsri

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 (ppb)						
	11-12 May 2024	12-13 May 2024	13-14 May 2024	14-15 May 2024	15-16 May 2024	16-17 May 2024	17-18 May 2024
09:00 - 10:00	4.1	3.2	3.9	3.5	8.2	13.8	6.5
10:00 - 11:00	3.1	4.2	4.9	3.5	16.7	18.3	10.0
11:00 - 12:00	3.6	4.2	8.4	3.5	20.2	5.8	4.5
12:00 - 13:00	3.6	5.7	21.4	4.5	26.2	3.8	5.5
13:00 - 14:00	4.1	16.7	4.4	9.0	8.2	5.3	6.5
14:00 - 15:00	13.1	14.2	3.9	6.0	6.2	3.8	10.0
15:00 - 16:00	16.1	9.7	3.9	16.0	6.2	3.4	9.5
16:00 - 17:00	3.6	4.8	2.9	8.1	8.2	3.4	13.5
17:00 - 18:00	3.1	3.8	2.9	5.1	3.7	3.4	9.0
18:00 - 19:00	3.1	9.3	2.9	4.1	3.7	3.4	6.0
19:00 - 20:00	3.6	5.8	2.9	3.6	3.7	3.4	4.5
20:00 - 21:00	3.6	6.3	2.9	3.6	3.2	3.4	3.5
21:00 - 22:00	4.1	4.3	3.4	3.6	3.2	3.4	3.5
22:00 - 23:00	4.6	6.8	3.4	3.6	3.7	3.4	3.5
23:00 - 00:00	4.6	3.8	3.4	3.6	3.2	3.9	3.6
00:00 - 01:00	5.2	6.8	3.0	3.6	3.3	3.4	3.6
01:00 - 02:00	4.7	3.8	4.0	3.6	3.3	3.4	3.6
02:00 - 03:00	3.7	3.3	3.5	3.1	3.3	3.4	3.6
03:00 - 04:00	3.2	3.3	4.0	3.1	3.3	3.9	4.1
04:00 - 05:00	3.7	2.8	3.5	3.1	3.3	3.9	3.6
05:00 - 06:00	5.2	2.8	3.0	3.1	3.8	3.9	3.6
06:00 - 07:00	4.7	2.8	3.0	3.6	3.3	3.9	4.1
07:00 - 08:00	5.2	2.8	3.5	4.6	4.3	4.0	4.1
08:00 - 09:00	5.2	3.4	4.0	5.2	4.8	4.0	3.6

Average-24Hr*	4.9	5.6	4.5	4.8	6.6	4.8	5.6
Max-1Hr	16.1	16.7	21.4	16.0	26.2	18.3	13.5
Min-1Hr	3.1	2.8	2.9	3.1	3.2	3.4	3.5

Standard-1Hr	300 ppb(780 ug/cu.m)						
Standard-24Hr	120 ppb(300 ug/cu.m)						

Remark : * Average time between 09:00-09:00

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



Ambient Air Monitoring Results : Sulfur dioxide MTR-PTTGC6-Refinery

Location : Takuan-Ao Pradu Community 1 Monitor Period : 11-18 May 2024
Analyzer Model : API 100A Station No : SCT-15
Serial No : 1715 Site Operator : Mr. Siwanon Kulawong

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	SO2 Concentration (ppb)						
	11-12 May 2024	12-13 May 2024	13-14 May 2024	14-15 May 2024	15-16 May 2024	16-17 May 2024	17-18 May 2024
12:00 - 13:00	3.2	4.9	13.8	4.7	12.6	3.5	4.7
13:00 - 14:00	3.8	12.6	3.0	8.7	10.1	3.8	5.8
14:00 - 15:00	13.9	12.3	3.9	6.0	6.8	2.9	10.0
15:00 - 16:00	14.6	7.9	3.6	13.5	5.2	3.5	10.6
16:00 - 17:00	4.3	4.0	3.1	9.3	9.7	2.7	14.3
17:00 - 18:00	4.2	4.3	3.8	2.7	3.7	3.2	9.0
18:00 - 19:00	4.3	9.2	2.8	3.2	4.1	3.4	5.2
19:00 - 20:00	2.7	4.7	3.0	4.2	4.2	4.4	4.2
20:00 - 21:00	4.6	5.7	4.5	4.5	3.5	4.2	3.2
21:00 - 22:00	4.2	4.5	2.8	4.0	4.1	4.6	4.6
22:00 - 23:00	2.8	6.2	4.3	4.4	4.4	4.6	3.2
23:00 - 00:00	4.0	4.1	3.7	3.1	4.0	3.5	3.1
00:00 - 01:00	5.3	7.0	2.8	3.9	4.7	3.9	4.3
01:00 - 02:00	3.6	3.3	4.0	4.6	3.0	3.7	2.8
02:00 - 03:00	3.0	3.1	4.0	4.7	3.6	4.1	4.1
03:00 - 04:00	2.7	3.7	3.9	4.0	4.4	2.9	4.5
04:00 - 05:00	4.2	3.4	3.6	4.2	4.3	4.0	4.7
05:00 - 06:00	6.7	4.2	3.7	3.5	4.5	3.8	3.0
06:00 - 07:00	2.9	4.2	2.7	3.6	4.1	3.4	4.5
07:00 - 08:00	5.3	4.7	3.8	2.8	4.6	4.6	4.0
08:00 - 09:00	6.4	4.0	4.2	3.3	2.7	3.7	3.8
09:00 - 10:00	4.5	4.1	3.4	9.2	13.2	5.3	6.1
10:00 - 11:00	3.6	4.3	2.9	12.5	12.6	10.4	8.9
11:00 - 12:00	3.1	9.0	3.7	13.9	5.6	2.8	6.0

Average-24Hr*	4.9	5.6	4.0	5.8	5.8	4.0	5.6
Max-1Hr	14.6	12.6	13.8	13.9	13.2	10.4	14.3
Min-1Hr	2.7	3.1	2.7	2.7	2.7	2.7	2.8

Standard-1Hr	300 ppb(780 ug/cu.m)						
Standard-24Hr	120 ppb(300 ug/cu.m)						

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

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



Ambient Air Monitoring Results : Sulfur dioxide MTR-PTTGC6-Refinery

Location : Takuan-Ao Pradu Community 2 Monitor Period : 11-18 May 2024
Analyzer Model : Teledyne 100A Station No : SCT-16
Serial No : 2009 Site Operator : Mr. Siwanon Kulawong

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	SO2 Concentration (ppb)						
	11-12 May 2024	12-13 May 2024	13-14 May 2024	14-15 May 2024	15-16 May 2024	16-17 May 2024	17-18 May 2024
12:00 - 13:00	1.7	4.8	11.9	2.9	12.0	2.1	1.8
13:00 - 14:00	2.0	12.5	2.9	6.1	8.8	3.2	3.6
14:00 - 15:00	13.1	12.1	3.4	4.1	3.8	2.3	8.0
15:00 - 16:00	12.3	8.4	2.2	12.5	5.2	2.0	10.9
16:00 - 17:00	2.7	2.0	1.8	8.3	10.4	2.0	11.5
17:00 - 18:00	2.6	3.5	2.9	1.6	2.8	2.6	7.1
18:00 - 19:00	2.3	9.7	2.1	2.1	3.1	2.2	4.9
19:00 - 20:00	2.9	6.0	2.9	3.6	2.9	3.5	2.0
20:00 - 21:00	2.0	3.8	2.3	1.6	3.3	3.5	2.8
21:00 - 22:00	3.3	1.9	3.6	2.8	2.9	2.0	2.3
22:00 - 23:00	1.7	3.6	1.6	2.5	3.0	1.6	3.3
23:00 - 00:00	2.5	2.2	2.0	1.6	2.1	2.9	2.9
00:00 - 01:00	4.7	5.1	1.9	1.8	2.3	3.0	3.5
01:00 - 02:00	2.0	2.4	3.4	3.1	3.1	3.1	2.9
02:00 - 03:00	2.4	1.9	1.8	2.2	1.6	3.6	2.4
03:00 - 04:00	1.9	3.4	2.6	2.2	3.4	1.9	3.1
04:00 - 05:00	2.0	2.5	2.1	2.7	2.7	2.0	2.6
05:00 - 06:00	4.7	3.6	2.4	2.5	3.3	2.7	2.0
06:00 - 07:00	2.2	3.4	3.0	2.6	3.6	2.3	2.6
07:00 - 08:00	5.4	1.6	1.8	3.4	2.2	2.6	1.7
08:00 - 09:00	3.9	2.6	3.4	3.3	1.9	2.7	3.3
09:00 - 10:00	2.9	3.3	2.8	8.8	11.2	4.7	3.8
10:00 - 11:00	1.9	3.2	3.4	13.1	12.7	10.1	9.1
11:00 - 12:00	2.4	10.6	3.3	12.7	4.7	2.9	4.4

Average-24Hr*	3.6	4.8	3.0	4.5	4.7	3.0	4.3
Max-1Hr	13.1	12.5	11.9	13.1	12.7	10.1	11.5
Min-1Hr	1.7	1.6	1.6	1.6	1.6	1.6	1.7
Standard-1Hr	300 ppb(780 ug/cu.m)						
Standard-24Hr	120 ppb(300 ug/cu.m)						

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

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

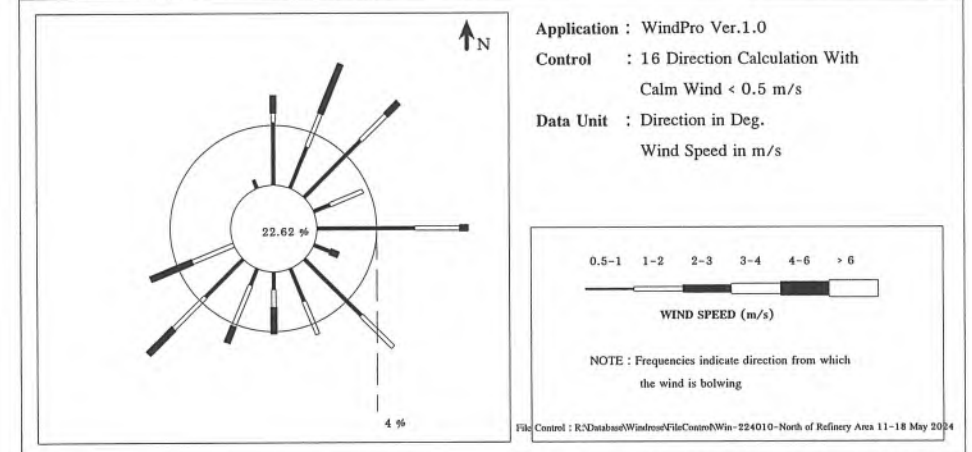
(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose MTR-PTTGC6-Refinery

Location : North of Refinery Area Monitor period : 11-18 May 2024
Wind Speed Model : Novalynx WS-25 Serial No : A5088
Wind Direction Model : Novalynx WS-25 Serial No : A5088

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	0.0417	0.0060	0.0119	0.0000	0.0000	0.0000	0.0595
NNE	0.0298	0.0238	0.0357	0.0000	0.0000	0.0000	0.0893
NE	0.0536	0.0238	0.0119	0.0000	0.0000	0.0000	0.0893
ENE	0.0119	0.0238	0.0000	0.0000	0.0000	0.0000	0.0357
E	0.0655	0.0298	0.0060	0.0000	0.0000	0.0000	0.1012
ESE	0.0119	0.0000	0.0060	0.0000	0.0000	0.0000	0.0179
SE	0.0536	0.0298	0.0000	0.0000	0.0000	0.0000	0.0833
SSE	0.0238	0.0238	0.0000	0.0000	0.0000	0.0000	0.0476
S	0.0119	0.0119	0.0179	0.0000	0.0000	0.0000	0.0417
SSW	0.0119	0.0298	0.0119	0.0000	0.0000	0.0000	0.0536
SW	0.0357	0.0298	0.0238	0.0000	0.0000	0.0000	0.0893
WSW	0.0000	0.0298	0.0298	0.0000	0.0000	0.0000	0.0595
W	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
WNW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NNW	0.0060	0.0000	0.0000	0.0000	0.0000	0.0000	0.0060
CALM	0.2262						



(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose

MTR-PTTGC6-Refinery

Location : North of Refinery Area

Monitor period : 11-18 May 2024

Wind Speed Model : Novalynx WS-25

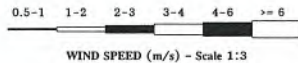
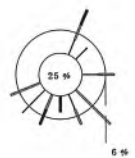
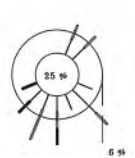
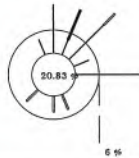
Serial No : A5088

Wind Direction Model : Novalynx WS-25


Serial No : A5088

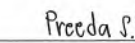
Time	11-12 May 2024		12-13 May 2024		13-14 May 2024		14-15 May 2024	
	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD
09:00 - 10:00	1.5	NE	0.5	NE	0.6	SSE	0.6	SE
10:00 - 11:00	0.6	E	0.6	SE	1.7	WSW	0.6	S
11:00 - 12:00	0.3	NE	0.3	E	1.2	SE	2.3	S
12:00 - 13:00	0.8	NNW	1.0	SSW	0.6	SW	0.7	NNE
13:00 - 14:00	1.8	SSE	0.3	SW	0.5	SW	0.6	N
14:00 - 15:00	2.2	NNE	1.0	SE	0.4	WSW	2.0	SW
15:00 - 16:00	1.9	SW	2.2	WSW	0.3	WSW	1.3	ENE
16:00 - 17:00	1.8	S	0.5	SSW	0.3	SW	0.6	N
17:00 - 18:00	2.5	NNE	0.4	SW	0.6	NE	0.6	SE
18:00 - 19:00	0.5	E	0.3	SSW	1.3	WSW	0.4	SE
19:00 - 20:00	0.6	NE	0.3	SW	1.9	SSE	1.3	WSW
20:00 - 21:00	0.3	NE	0.6	SW	1.1	NNE	1.9	E
21:00 - 22:00	0.5	ENE	1.6	NNE	0.3	NE	2.3	NE
22:00 - 23:00	0.5	NNE	2.3	SW	1.7	SE	0.5	E
23:00 - 24:00	0.5	E	1.6	NE	1.1	SSW	2.2	WSW
00:00 - 01:00	0.3	N	0.9	S	0.3	WSW	0.4	SSW
01:00 - 02:00	0.6	NE	2.0	S	0.3	SSW	0.4	SSW
02:00 - 03:00	0.3	NNE	0.6	ESE	1.2	SE	1.9	ENE
03:00 - 04:00	0.6	N	0.4	S	2.4	NNE	0.5	N
04:00 - 05:00	0.3	NE	1.0	SSW	0.6	E	0.3	NE
05:00 - 06:00	0.5	NE	0.9	SE	2.4	SSW	0.5	NE
06:00 - 07:00	0.6	N	0.5	SSE	0.8	NNE	1.5	SW
07:00 - 08:00	0.5	E	0.9	NNE	1.6	E	2.2	NE
08:00 - 09:00	0.6	N	1.5	S	2.5	S	0.3	E

Wind Rose



File Control R:\Database\Windrose\FireControl\Win-224010-North of Refinery Area 11-18 May 2024


(Miss Katesarin Vorradetwittaya)
Environmental Scientist


(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose

MTR-PTTGC6-Refinery

Location : North of Refinery Area

Monitor period : 11-18 May 2024

Wind Speed Model : Novalynx WS-25

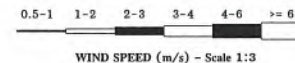
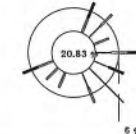
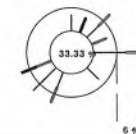
Serial No : A5088

Wind Direction Model : Novalynx WS-25


Serial No : A5088

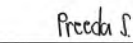
Time	15-16 May 2024		16-17 May 2024		17-18 May 2024	
	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD
09:00 - 10:00	1.6	SSE	0.6	SW	2.0	WSW
10:00 - 11:00	0.4	SSE	0.6	SW	0.8	SE
11:00 - 12:00	2.3	NNE	1.6	ENE	0.3	ESE
12:00 - 13:00	0.6	SSE	0.6	NE	0.5	SE
13:00 - 14:00	0.5	SE	0.3	NNE	1.0	SW
14:00 - 15:00	2.4	N	0.4	ENE	1.6	ENE
15:00 - 16:00	1.4	SE	0.5	N	0.4	NNE
16:00 - 17:00	0.5	E	2.1	WSW	0.4	NE
17:00 - 18:00	0.9	E	1.9	E	1.3	SSW
18:00 - 19:00	2.1	SW	0.4	ESE	1.5	NE
19:00 - 20:00	1.0	NNE	1.4	WSW	1.3	SSE
20:00 - 21:00	2.2	SW	0.4	SSW	1.8	NNE
21:00 - 22:00	2.4	N	1.1	E	2.2	ESE
22:00 - 23:00	0.5	NNE	2.2	NNE	0.5	SE
23:00 - 24:00	0.3	ENE	0.9	SE	0.4	S
00:00 - 01:00	2.2	SSW	0.3	E	0.6	ESE
01:00 - 02:00	0.8	ENE	0.5	E	1.0	WSW
02:00 - 03:00	0.4	ENE	1.9	NE	1.7	E
03:00 - 04:00	2.1	WSW	0.4	NE	2.1	NNE
04:00 - 05:00	0.6	SW	1.4	SSW	0.5	NE
05:00 - 06:00	1.7	N	0.6	SSW	2.3	E
06:00 - 07:00	1.1	SW	0.4	SSW	0.5	SSE
07:00 - 08:00	0.6	NE	0.3	WSW	0.3	SE
08:00 - 09:00	1.1	SW	0.9	E	0.6	E

Wind Rose



File Control R:\Database\Windrose\FireControl\Win-224010-North of Refinery Area 11-18 May 2024


(Miss Katesarin Vorradetwittaya)
Environmental Scientist


(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose

MTR-PTTGC6-Refinery

Location : North of VCU Area

Monitor period : 11-18 May 2024

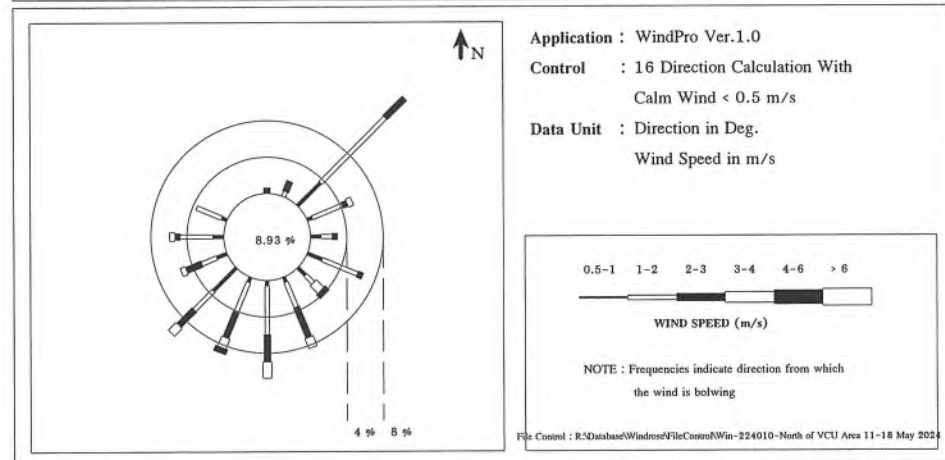
Wind Speed Model : Novalynx WS-25

Serial No : A4907

Wind Direction Model : Novalynx WS-25

Serial No : A4907

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	0.0000	0.0060	0.0000	0.0000	0.0000	0.0060
NNE	0.0000	0.0060	0.0119	0.0000	0.0000	0.0000	0.0179
NE	0.0357	0.1012	0.0298	0.0000	0.0000	0.0000	0.1667
ENE	0.0060	0.0357	0.0060	0.0060	0.0000	0.0000	0.0536
E	0.0119	0.0119	0.0060	0.0000	0.0000	0.0000	0.0298
ESE	0.0179	0.0417	0.0060	0.0000	0.0000	0.0000	0.0655
SE	0.0119	0.0119	0.0000	0.0119	0.0060	0.0000	0.0417
SSE	0.0060	0.0298	0.0357	0.0119	0.0000	0.0000	0.0833
S	0.0060	0.0536	0.0298	0.0179	0.0000	0.0000	0.1071
SSW	0.0060	0.0357	0.0298	0.0119	0.0060	0.0000	0.0893
SW	0.0357	0.0298	0.0238	0.0119	0.0000	0.0000	0.1012
WSW	0.0119	0.0179	0.0179	0.0060	0.0000	0.0000	0.0536
W	0.0119	0.0357	0.0060	0.0060	0.0000	0.0000	0.0595
WNW	0.0060	0.0298	0.0000	0.0000	0.0000	0.0000	0.0357
NW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NNW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CALM	0.0893						



(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose

MTR-PTTGC6-Refinery

Location : North of VCU Area

Monitor period : 11-18 May 2024

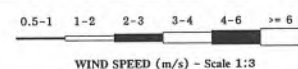
Wind Speed Model : Novalynx WS-25

Serial No : A4907

Wind Direction Model : Novalynx WS-25

Serial No : A4907

Time	11-12 May 2024		12-13 May 2024		13-14 May 2024		14-15 May 2024	
	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD
09:00 - 10:00	1.2	NE	1.6	SSW	0.8	SW	0.6	E
10:00 - 11:00	0.4	NE	2.9	SSE	2.7	WSW	1.5	S
11:00 - 12:00	3.3	SSW	3.2	S	0.8	SSW	2.6	SSE
12:00 - 13:00	1.8	SSW	1.8	WSW	4.9	SSW	2.1	SSW
13:00 - 14:00	1.9	SW	2.8	WSW	2.8	S	1.7	S
14:00 - 15:00	3.0	S	1.4	WSW	2.3	SSW	3.0	SW
15:00 - 16:00	2.6	S	2.9	WSW	0.7	ESE	1.5	WSW
16:00 - 17:00	0.9	SE	1.1	SW	2.4	NE	2.0	SSW
17:00 - 18:00	2.3	N	2.9	SW	2.5	NE	2.2	SW
18:00 - 19:00	0.8	NE	2.7	SW	1.2	NE	1.5	SW
19:00 - 20:00	1.1	ENE	0.9	SW	0.7	NE	1.5	W
20:00 - 21:00	1.6	NE	1.0	SW	2.6	W	1.2	WNW
21:00 - 22:00	1.3	NE	3.2	SSW	2.4	E	1.3	W
22:00 - 23:00	1.2	NE	1.9	SSW	2.0	NNE	1.5	W
23:00 - 24:00	0.8	NE	1.9	SSW	2.9	NNE	1.5	WNW
00:00 - 01:00	0.7	NE	0.5	SW	1.6	NE	1.6	WNW
01:00 - 02:00	1.6	NE	3.0	SW	2.5	ENE	1.3	W
02:00 - 03:00	1.8	NE	3.2	SE	1.5	NE	1.2	WNW
03:00 - 04:00	1.1	NE	0.4	ENE	1.7	NE	0.8	WNW
04:00 - 05:00	2.0	NE	1.6	NE	1.1	NE	0.2	WSW
05:00 - 06:00	1.2	ENE	0.3	NW	0.3	NNE	1.5	W
06:00 - 07:00	1.2	NE	0.2	NW	2.8	NE	0.8	W
07:00 - 08:00	0.0	NE	0.3	WSW	0.7	NE	0.7	W
08:00 - 09:00	1.8	S	1.1	W	2.5	NE	0.0	WSW



File Control : R:\Database\Windrose\FileControl\Win-224010-North of VCU Area 11-18 May 2024

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose MTR-PTTGC6-Refinery

Location : North of VCU Area Monitor period : 11-18 May 2024

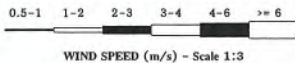
Wind Speed Model : Novalynx WS-25

Serial No : A4907

Wind Direction Model : Novalynx WS-25

Serial No : A4907

Time	15-16 May 2024		16-17 May 2024		17-18 May 2024		
	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD	
09:00 - 10:00	0.3	S	3.1	WSW	2.2	SSW	
10:00 - 11:00	1.1	S	1.1	SW	1.5	S	
11:00 - 12:00	3.5	S	0.9	WSW	0.4	SSW	
12:00 - 13:00	0.8	SW	0.9	SW	3.1	SE	
13:00 - 14:00	3.4	W	1.8	NE	3.0	SSE	
14:00 - 15:00	1.9	WNW	1.6	NE	3.8	SSE	
15:00 - 16:00	1.8	SSW	1.2	ENE	2.5	S	
16:00 - 17:00	0.7	S	1.4	ENE	1.7	SSE	
17:00 - 18:00	0.2	SSE	1.4	ESE	1.2	SSW	
18:00 - 19:00	1.3	SE	0.9	SW	2.3	SSW	
19:00 - 20:00	1.7	ESE	2.0	S	0.4	SSW	
20:00 - 21:00	1.2	ESE	1.1	S	1.0	S	
21:00 - 22:00	3.4	ENE	2.4	SSE	1.4	ESE	
22:00 - 23:00	1.5	NNE	1.7	SSE	0.8	ESE	
23:00 - 24:00	0.6	ESE	2.0	ESE	0.5	SSE	
00:00 - 01:00	1.1	ESE	4.2	SE	0.5	SE	
01:00 - 02:00	1.9	ESE	2.1	SSE	1.6	SE	
02:00 - 03:00	1.7	SSE	1.6	S	1.9	SSE	
03:00 - 04:00	2.3	SSE	2.2	SSE	1.3	E	
04:00 - 05:00	1.1	SSE	1.8	ENE	1.2	NE	
05:00 - 06:00	1.2	S	0.6	NE	1.3	ENE	
06:00 - 07:00	1.5	E	0.9	ENE	0.9	E	
07:00 - 08:00	0.6	WSW	0.4	NE	2.7	S	
08:00 - 09:00	2.0	SW	1.3	ESE	0.2	SE	
Wind Rose							



File Control : R:\Database\Windrose\FileControl\Win-224010-North of VCU Area 11-18 May 2024

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose MTR-PTTGC6-Refinery

Location : Takuan-Ao Pradu Community 1

Monitor period : 11-18 May 2024

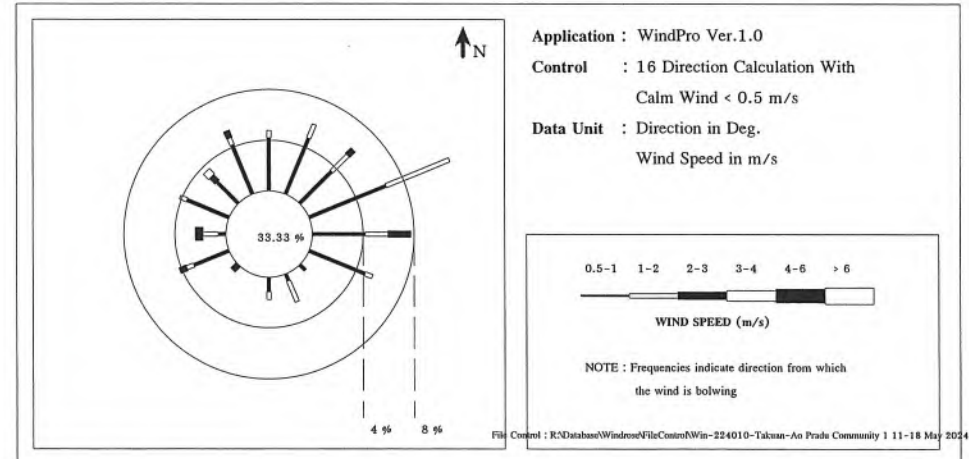
Wind Speed Model : Novalynx WS-25

Serial No : A4905

Wind Direction Model : Novalynx WS-25

Serial No : A4905

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	0.0417	0.0060	0.0000	0.0000	0.0000	0.0000	0.0476
NNE	0.0476	0.0119	0.0000	0.0000	0.0000	0.0000	0.0595
NE	0.0357	0.0179	0.0060	0.0000	0.0000	0.0000	0.0595
ENE	0.0655	0.0536	0.0000	0.0000	0.0000	0.0000	0.1190
E	0.0417	0.0179	0.0179	0.0000	0.0000	0.0000	0.0774
ESE	0.0476	0.0060	0.0000	0.0000	0.0000	0.0000	0.0536
SE	0.0060	0.0000	0.0000	0.0000	0.0000	0.0000	0.0060
SSE	0.0060	0.0179	0.0000	0.0000	0.0000	0.0000	0.0238
S	0.0119	0.0060	0.0000	0.0000	0.0000	0.0000	0.0179
SSW	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SW	0.0000	0.0000	0.0060	0.0000	0.0000	0.0000	0.0060
WSW	0.0298	0.0060	0.0060	0.0000	0.0000	0.0000	0.0417
W	0.0060	0.0119	0.0000	0.0000	0.0060	0.0000	0.0238
WNW	0.0357	0.0060	0.0000	0.0000	0.0000	0.0000	0.0417
NW	0.0238	0.0000	0.0060	0.0060	0.0000	0.0000	0.0357
NNW	0.0417	0.0060	0.0060	0.0000	0.0000	0.0000	0.0536
CALM	0.3333						



(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose

MTR-PTTGC6-Refinery

Location : Takuan-Ao Pradu Community 1

Monitor period : 11-18 May 2024

Wind Speed Model : Novalynx WS-25

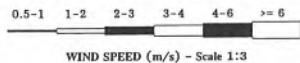
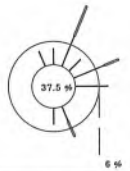
Serial No : A4905

Wind Direction Model : Novalynx WS-25

Serial No : A4905

Time	11-12 May 2024		12-13 May 2024		13-14 May 2024		14-15 May 2024	
	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD
12:00 - 13:00	0.6	NNW	1.6	ENE	0.5	NE	0.6	ENE
13:00 - 14:00	1.6	NNE	0.1	E	1.4	ENE	1.2	ENE
14:00 - 15:00	1.3	SSE	0.0	E	0.4	NW	0.8	ENE
15:00 - 16:00	0.3	ESE	1.2	E	0.0	WNW	0.4	E
16:00 - 17:00	0.6	SSE	0.4	E	0.7	WSW	0.5	ENE
17:00 - 18:00	1.4	NNE	0.0	ENE	2.3	NE	1.9	ESE
18:00 - 19:00	0.9	N	0.2	E	2.2	WSW	0.3	ESE
19:00 - 20:00	1.7	ENE	0.6	E	0.5	WSW	0.3	E
20:00 - 21:00	0.4	E	2.1	E	1.2	E	0.6	E
21:00 - 22:00	0.3	ENE	2.4	E	2.6	SW	0.3	E
22:00 - 23:00	0.5	ENE	0.4	E	1.0	ENE	0.3	ESE
23:00 - 24:00	0.3	ENE	0.5	E	0.4	ENE	0.5	E
00:00 - 01:00	0.4	NNE	0.6	ENE	0.5	ENE	0.3	ESE
01:00 - 02:00	0.5	NNE	0.0	E	0.5	NE	0.4	E
02:00 - 03:00	0.3	NE	4.3	W	0.4	ENE	0.5	E
03:00 - 04:00	0.4	N	0.3	WSW	0.6	NE	0.5	ESE
04:00 - 05:00	0.6	NE	0.6	WSW	0.6	N	0.3	ESE
05:00 - 06:00	0.6	NNE	1.7	SSE	0.6	N	0.5	ESE
06:00 - 07:00	0.5	ENE	0.3	ESE	2.4	NNW	0.3	SE
07:00 - 08:00	0.4	NNE	0.3	ESE	1.8	NE	1.6	ENE
08:00 - 09:00	0.4	ENE	0.3	ESE	0.0	NE	1.0	NE
09:00 - 10:00	0.5	E	0.5	ESE	0.0	NE	0.7	NNE
10:00 - 11:00	0.8	E	0.5	SE	0.0	NNE	0.8	N
11:00 - 12:00	0.5	S	1.3	ENE	0.5	NNW	0.0	ENE

Wind Rose



File Control :R:\Database\Windrose\FireControl\Win-224010-Takuan-Ao Pradu Community 1 11-18 May 2024

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose

MTR-PTTGC6-Refinery

Location : Takuan-Ao Pradu Community 1

Monitor period : 11-18 May 2024

Wind Speed Model : Novalynx WS-25

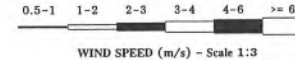
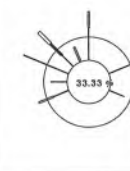
Serial No : A4905

Wind Direction Model : Novalynx WS-25

Serial No : A4905

Time	15-16 May 2024		16-17 May 2024		17-18 May 2024	
	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD
12:00 - 13:00	0.3	E	0.5	ESE	0.4	NE
13:00 - 14:00	1.0	NE	0.3	WSW	0.5	NNE
14:00 - 15:00	1.2	E	0.6	W	0.5	NNE
15:00 - 16:00	1.0	ENE	0.5	WNW	0.6	NNE
16:00 - 17:00	0.7	NNW	0.6	NW	0.5	ENE
17:00 - 18:00	0.4	NW	0.4	NW	0.5	NNE
18:00 - 19:00	0.3	NNW	0.4	NW	0.5	NE
19:00 - 20:00	0.6	NNW	0.3	WNW	0.6	N
20:00 - 21:00	0.7	NW	0.5	WNW	0.3	N
21:00 - 22:00	0.4	NW	0.3	WNW	0.6	NNE
22:00 - 23:00	0.5	WNW	0.5	WNW	0.5	NE
23:00 - 24:00	0.3	WNW	3.5	NW	1.2	WNW
00:00 - 01:00	0.5	WNW	1.3	N	0.7	NNW
01:00 - 02:00	0.6	NW	0.6	ENE	0.5	WNW
02:00 - 03:00	0.5	NNW	0.3	NNE	1.6	W
03:00 - 04:00	1.3	ENE	1.8	WSW	0.6	WSW
04:00 - 05:00	0.7	ESE	0.3	WSW	0.4	WSW
05:00 - 06:00	0.6	ESE	0.4	WSW	1.3	W
06:00 - 07:00	1.7	S	0.5	WSW	0.6	NW
07:00 - 08:00	0.3	NE	2.5	NW	0.6	NNW
08:00 - 09:00	2.4	E	0.5	N	0.8	ENE
09:00 - 10:00	0.5	ESE	1.2	NNW	1.0	SSE
10:00 - 11:00	0.3	ESE	0.6	N	0.3	ESE
11:00 - 12:00	0.5	ESE	0.5	ENE	0.5	S

Wind Rose



File Control :R:\Database\Windrose\FireControl\Win-224010-Takuan-Ao Pradu Community 1 11-18 May 2024

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose MTR-PTTGC6-Refinery

Location : Takuan-Ao Pradu Community 2

Monitor period : 11-18 May 2024

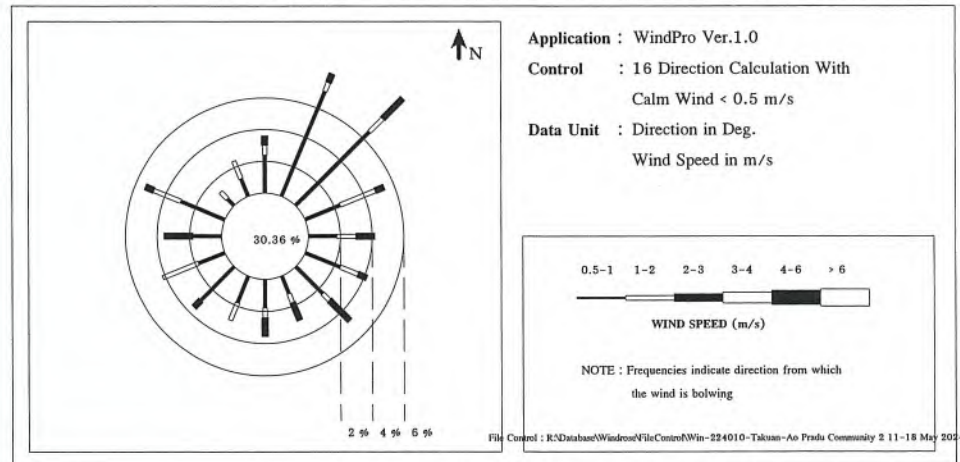
Wind Speed Model : Novalynx WS-25

Serial No : A5090

Wind Direction Model : Novalynx WS-25

Serial No : A5090

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	0.0238	0.0060	0.0060	0.0000	0.0000	0.0000	0.0357
NNE	0.0714	0.0060	0.0060	0.0000	0.0000	0.0000	0.0833
NE	0.0655	0.0119	0.0179	0.0000	0.0000	0.0000	0.0952
ENE	0.0238	0.0238	0.0060	0.0000	0.0000	0.0000	0.0536
E	0.0179	0.0119	0.0119	0.0000	0.0000	0.0000	0.0417
ESE	0.0238	0.0119	0.0060	0.0000	0.0000	0.0000	0.0417
SE	0.0238	0.0060	0.0179	0.0000	0.0000	0.0000	0.0476
SSE	0.0119	0.0060	0.0119	0.0000	0.0000	0.0000	0.0298
S	0.0179	0.0060	0.0119	0.0000	0.0000	0.0000	0.0357
SSW	0.0179	0.0119	0.0000	0.0000	0.0000	0.0000	0.0298
SW	0.0298	0.0000	0.0060	0.0000	0.0000	0.0000	0.0357
WSW	0.0179	0.0238	0.0000	0.0000	0.0000	0.0000	0.0417
W	0.0179	0.0000	0.0179	0.0000	0.0000	0.0000	0.0357
WNW	0.0298	0.0179	0.0060	0.0000	0.0000	0.0000	0.0536
NW	0.0060	0.0060	0.0000	0.0000	0.0000	0.0000	0.0119
NNW	0.0119	0.0119	0.0000	0.0000	0.0000	0.0000	0.0238
CALM	0.3036						



(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose MTR-PTTGC6-Refinery

Location : Takuan-Ao Pradu Community 2

Monitor period : 11-18 May 2024

Wind Speed Model : Novalynx WS-25

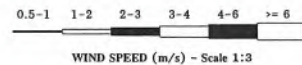
Serial No : A5090

Wind Direction Model : Novalynx WS-25

Serial No : A5090

Time	11-12 May 2024		12-13 May 2024		13-14 May 2024		14-15 May 2024	
	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD
12:00 - 13:00	1.1	NNW	0.9	SW	1.0	SSE	0.5	S
13:00 - 14:00	1.9	ENE	2.5	SE	0.5	SSE	0.4	WSW
14:00 - 15:00	1.1	ESE	1.6	WSW	1.0	WNW	0.6	SW
15:00 - 16:00	0.3	SSE	0.5	WSW	0.7	S	0.4	S
16:00 - 17:00	0.3	SE	0.4	SW	0.6	NE	0.4	SSW
17:00 - 18:00	0.6	NE	0.4	W	0.6	NNE	1.7	WNW
18:00 - 19:00	0.8	W	0.4	WSW	0.4	NNE	0.4	WNW
19:00 - 20:00	1.0	ENE	0.4	SSW	0.6	NNE	0.6	WNW
20:00 - 21:00	1.5	E	0.9	ESE	1.7	WSW	0.3	WNW
21:00 - 22:00	2.5	NE	0.7	SSW	2.3	ENE	0.5	WNW
22:00 - 23:00	0.4	NE	0.6	SW	0.4	N	0.4	WNW
23:00 - 24:00	0.5	N	0.6	WSW	0.3	NNE	0.6	WNW
00:00 - 01:00	0.3	NE	0.6	SSW	0.6	NNE	0.5	WNW
01:00 - 02:00	0.4	NE	0.5	SW	0.6	NNE	1.6	WSW
02:00 - 03:00	0.5	E	1.6	ENE	0.5	NNE	2.3	W
03:00 - 04:00	0.3	NE	1.9	N	0.3	NNE	0.3	WNW
04:00 - 05:00	0.3	ENE	1.9	NNE	0.5	N	0.3	NW
05:00 - 06:00	0.6	ENE	1.4	NNW	0.3	NNE	2.5	NNE
06:00 - 07:00	0.5	N	0.5	NNW	0.4	NNE	0.6	NE
07:00 - 08:00	0.6	ENE	0.4	NNW	0.5	NE	0.6	ENE
08:00 - 09:00	0.3	NNE	0.5	WNW	0.5	NE	0.3	E
09:00 - 10:00	0.4	ENE	0.5	W	0.5	ENE	1.6	SSW
10:00 - 11:00	0.6	SE	1.6	WSW	0.3	ENE	2.1	SE
11:00 - 12:00	0.4	S	2.0	W	2.1	S	1.8	SSW

Wind Rose



File Control : R:\Database\Windrose\FileControl\Win-224010-Takuan-Ao Pradu Community 2 11-18 May 2024

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



Meteorological Monitoring Results : Wind Rose

MTR-PTTGC6-Refinery

Location : Takuan-Ao Pradu Community 2

Monitor period : 11-18 May 2024

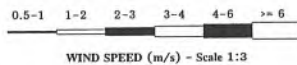
Wind Speed Model : Novalynx WS-25

Serial No : A5090

Wind Direction Model : Novalynx WS-25

Serial No : A5090

Time	15-16 May 2024		16-17 May 2024		17-18 May 2024		
	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD	
12:00 - 13:00	0.5	SSW	0.4	WNW	0.4	SSE	
13:00 - 14:00	0.5	W	2.4	NE	2.1	SW	
14:00 - 15:00	0.3	WSW	0.5	NNE	1.6	SE	
15:00 - 16:00	0.4	W	0.4	NNE	1.8	S	
16:00 - 17:00	2.5	ESE	0.6	NNE	2.1	SSE	
17:00 - 18:00	1.6	ENE	0.5	NE	1.7	WNW	
18:00 - 19:00	0.9	E	0.3	NNE	0.3	WNW	
19:00 - 20:00	0.3	E	0.3	NE	0.6	NNW	
20:00 - 21:00	0.3	E	0.6	NNE	0.6	NW	
21:00 - 22:00	2.1	NE	0.3	NNE	0.5	N	
22:00 - 23:00	0.4	NNE	0.4	NNE	0.3	NW	
23:00 - 24:00	0.6	NNE	0.8	ESE	2.2	SE	
00:00 - 01:00	0.5	NE	0.6	ESE	0.3	SE	
01:00 - 02:00	0.6	E	2.4	E	0.6	SE	
02:00 - 03:00	0.3	NNE	2.0	WNW	0.5	SE	
03:00 - 04:00	2.4	S	1.1	ESE	2.4	N	
04:00 - 05:00	0.6	SSE	0.6	NE	1.2	NE	
05:00 - 06:00	1.7	NE	0.3	NNE	0.5	NE	
06:00 - 07:00	0.3	NNE	0.5	NNE	0.5	NE	
07:00 - 08:00	0.6	NNE	0.5	NE	1.8	E	
08:00 - 09:00	0.9	SW	2.3	E	0.3	SE	
09:00 - 10:00	0.3	WSW	0.6	NNE	2.1	W	
10:00 - 11:00	0.5	WSW	0.6	S	0.8	SE	
11:00 - 12:00	1.0	NW	2.5	SSE	0.6	ESE	
Wind Rose							



File Control R:\Database\Windrose\FileControl\Win-224010-Takuan-Ao Pradu Community 2 11-18 May 2024

(Miss Katesarin Vorradetwittaya)

 Environmental Scientist

(Miss Preeda Somjai)

 Technical Management Team

คุณภาพอากาศจากปล่องระบายอากาศ



บริษัท ซีคอต จำกัด
SECOT CO., LTD.

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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. : PTTGC6 (Refinery)_224010_Cert-Stk/Main
Branch 6 (Refinery) SAMPLING DATE : 14/05/2024
SAMPLING BY : SECOT Co., Ltd. ANALYTICAL DATE : 16-17/05/2024
RECEIVED DATE : 16/05/2024 SAMPLE CONDITION : Normal
REPORT DATE : 24/05/2024 OPERATOR : Mr. Song Hangchhankun
STACK LOCATION : Main Stack SOURCE DESCRIPTION : Combustion
FUEL TYPE : Fuel gas and Fuel Oil

STACK DESCRIPTION

Height : 140.0 m Gas Velocity : 10.5 m/s
Diameter : 4.5 m Flow rate ^{1/} : 5,395 Ncu.m/min
Temperature : 204 °C Excess Oxygen : 4.5 %

PARAMETER	UNIT	RESULTS		ASSIGN VALUE ^{2/}	STANDARD ^{3/}	REFERENCE METHODS
		4.5%O ₂	7%O ₂			
Particulate Matter	mg/Ncu.m	6.29	5.34	240	240	US. EPA Method 5

Phatchara Samanchan

(Miss Phatchara Samanchan)

Analyst

REG.NO. 7-239-ก-0021

Maiwim Poowasanpetch

(Miss Narisa Poowasanpetch)

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. ^{1/} At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. ^{2/} The assign value in EIA report.

5. ^{3/} Notification of the Ministry of Natural Resources and Environment B.E.2554.



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

STACK EMISSION ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Co., Ltd. REF. NO. : PTTGC6 (Refinery)_224010_Cert-Stk/Main
Branch 6 (Refinery) SAMPLING DATE : 14/05/2024
SAMPLING BY : SECOT Co., Ltd. ANALYTICAL DATE : 15-21/05/2024
RECEIVED DATE : 16/05/2024 SAMPLE CONDITION : Normal
REPORT DATE : 27/05/2024 OPERATOR : Mr. Song Hangchhankun
STACK LOCATION : Main Stack SOURCE DESCRIPTION : Combustion
FUEL TYPE : Fuel gas and Fuel Oil

STACK DESCRIPTION

Height : 140.0 m Gas Velocity : 10.5 m/s
Diameter : 4.5 m Flow rate ^{1/} : 5,395 Ncu.m/min
Temperature : 204 °C Excess Oxygen : 4.5 %

PARAMETER	UNIT	ND Non-detectable	RESULTS		ASSIGN VALUE ^{2/}	STANDARD ^{3/}	REFERENCE METHODS
			4.5%O ₂	7%O ₂			
Lead	mg/m ³	<0.02	ND	ND	5.0	5.0	US. EPA Method 29
Mercury	mg/m ³	<0.0003	ND	ND	2.4	2.4	US. EPA Method 29

Krisana Chanthoom

(Miss Krisana Chanthoom)

Analyst

REG.NO. 7-239-ก-0017

Maiwim Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO. 7-239-ก-0010

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STACK EMISSION ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Co., Ltd. REF. NO. : PTTGC6 (Refinery)_224010_Cert-Stk/Main
Branch 6 (Refinery) SAMPLING DATE : 14/05/2024
SAMPLING BY : SECOT Co., Ltd. ANALYTICAL DATE : 21/05/2024
RECEIVED DATE : 16/05/2024 SAMPLE CONDITION : Normal
REPORT DATE : 27/05/2024 OPERATOR : Mr. Song Hangchewankun
STACK LOCATION : Main Stack SOURCE DESCRIPTION : Combustion
FUEL TYPE : Fuel gas and Fuel Oil

STACK DESCRIPTION

Height : 140.0 m Gas Velocity : 10.5 m/s
Diameter : 4.5 m Flow rate ^{1/} : 5,395 Ncu.m/min
Temperature : 204 °C Excess Oxygen : 4.5 %

PARAMETER	UNIT	ND	RESULTS		ASSIGN	STANDARD ^{3/}	REFERENCE
		Non-detectable	4.5%O ₂	7%O ₂	VALUE ^{2/}		
Hydrogen Sulfide	ppm	<0.30	ND	-	60	-	US. EPA Method 16
(H ₂ S)	ppm	<0.25	-	ND			

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

Narisa Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

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

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4. ^{2/} The assign value in EIA report.

5. ^{3/} Notification of the Ministry of Natural Resources and Environment B.E.2554.



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

STACK EMISSION ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Co., Ltd. REF. NO. : PTTGC6 (Refinery)_224010_Cert-Stk/Main
Branch 6 (Refinery) SAMPLING DATE : 14/05/2024
SAMPLING BY : SECOT Co., Ltd. ANALYTICAL DATE : 18/05/2024
RECEIVED DATE : 16/05/2024 SAMPLE CONDITION : Normal
REPORT DATE : 27/05/2024 OPERATOR : Mr. Song Hangchewankun
STACK LOCATION : Main Stack SOURCE DESCRIPTION : Combustion
FUEL TYPE : Fuel gas and Fuel Oil

STACK DESCRIPTION

Height : 140.0 m Gas Velocity : 10.5 m/s
Diameter : 4.5 m Flow rate ^{1/} : 5,395 Ncu.m/min
Temperature : 204 °C Excess Oxygen : 4.5 %

PARAMETER	UNIT	ND	RESULTS		ASSIGN	STANDARD ^{3/}	REFERENCE
		Non-detectable	4.5%O ₂	7%O ₂	VALUE ^{2/}		
TVOC	ppm	-	1.85	1.57	-	-	US. EPA Method 25A

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

Narisa Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

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4. ^{2/} The assign value in EIA report.

5. ^{3/} Notification of the Ministry of Natural Resources and Environment B.E.2554.

**The Monitoring Result of Emission Concentration
Main Stack
PTT Global Chemical Public Company Limited
May 14, 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	4.60	4.55	39.30	39.30	33.41
2	4.59	4.55	40.58	40.58	34.50
3	4.52	4.48	40.20	40.20	34.03
Average	4.57	4.53	40.03	40.03	33.98

Run Number	Oxygen content (%)		Sulfur dioxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	4.60	4.55	15.07	15.04	12.79
2	4.59	4.55	15.08	15.05	12.79
3	4.52	4.48	14.49	14.45	12.23
Average	4.57	4.53	14.88	14.85	12.60

Run Number	Oxygen content (%)		Carbonmonoxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	4.60	4.55	28.65	28.64	24.35
2	4.59	4.55	30.37	30.36	25.81
3	4.52	4.48	32.96	32.95	27.89
Average	4.57	4.53	30.66	30.65	26.02

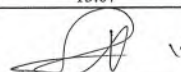
**PTT Global Chemical Public Company Limited
EMISSION TEST RESULT**

Date: May 14, 2024
 Start time: 11:10 AM
 O₂ instrument Model: AMI 70
 NO_x instrument Model: Teledyne 200 EM
 SO₂ instrument Model: API 100 AH
 CO instrument Model: API 300 A
 Fuel Type : Fuel Gas and Fuel Oil

Run # : 1
 Location : Main Stack
 Finish time : 11:30 AM
 Serial No.: 161212-14
 Serial No.: 435
 Serial No.: 058
 Serial No.: 1070
 Test Operator : Song H.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)
11:10 AM	4.64	40.75	14.86	29.01
11:11 AM	4.61	40.82	15.09	28.72
11:12 AM	4.61	40.75	15.12	28.58
11:13 AM	4.61	38.84	15.42	22.51
11:14 AM	4.60	38.54	14.79	22.38
11:15 AM	4.58	38.73	14.94	22.21
11:16 AM	4.59	38.89	15.14	22.24
11:17 AM	4.64	39.08	15.24	23.82
11:18 AM	4.64	39.06	14.96	26.07
11:19 AM	4.57	39.03	15.04	27.18
11:20 AM	4.64	39.03	14.65	27.48
11:21 AM	4.58	38.91	14.96	28.04
11:22 AM	4.64	38.80	14.45	28.94
11:23 AM	4.54	38.85	14.57	29.86
11:24 AM	4.56	38.86	14.87	30.43
11:25 AM	4.55	38.87	15.10	30.86
11:26 AM	4.68	39.00	15.22	34.14
11:27 AM	4.60	39.11	15.34	36.79
11:28 AM	4.61	39.32	15.50	36.27
11:29 AM	4.58	39.78	15.58	33.79
11:30 AM	4.50	40.29	15.59	32.40
Average	4.60	39.30	15.07	28.65

Signature



(Miss Katesarin Vorradetwittaya)

Environmental Scientist

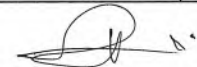
PTT Global Chemical Public Company Limited
EMISSION TEST RESULT

Date: May 14, 2024
Start time: 11:31 AM
O₂ instrument Model: AMI 70
NO_x instrument Model: Teledyne 200 EM
SO₂ instrument Model: API 100 AH
CO instrument Model: API 300 A
Fuel Type : Fuel Gas and Fuel Oil

Run # : 2
Location : Main Stack
Finish time : 11:51 AM
Serial No.: 161212-14
Serial No.: 435
Serial No.: 058
Serial No.: 1070
Test Operator : Song H.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)
11:31 AM	4.56	40.54	15.62	32.28
11:32 AM	4.67	40.85	15.66	32.26
11:33 AM	4.54	40.75	15.82	32.31
11:34 AM	4.53	40.47	15.91	32.09
11:35 AM	4.62	40.48	15.78	31.59
11:36 AM	4.59	40.58	15.77	30.79
11:37 AM	4.49	40.50	15.60	30.20
11:38 AM	4.52	40.33	15.48	29.91
11:39 AM	4.50	40.13	15.32	32.04
11:40 AM	4.55	40.15	15.13	36.12
11:41 AM	4.60	40.38	14.97	37.54
11:42 AM	4.60	40.52	14.86	37.24
11:43 AM	4.52	40.58	14.72	32.80
11:44 AM	4.55	40.58	14.56	30.18
11:45 AM	4.63	40.61	14.60	29.41
11:46 AM	4.60	40.60	14.53	27.02
11:47 AM	4.70	40.69	14.42	24.65
11:48 AM	4.73	41.00	14.38	24.17
11:49 AM	4.64	41.05	14.41	24.43
11:50 AM	4.61	40.78	14.48	25.00
11:51 AM	4.63	40.54	14.63	25.76
Average	4.59	40.58	15.08	30.37

Signature



(Miss Katesarin Vorradetwittaya)

Environmental Scientist

PTT Global Chemical Public Company Limited
EMISSION TEST RESULT

Date: May 14, 2024
Start time: 11:52 AM
O₂ instrument Model: AMI 70
NO_x instrument Model: Teledyne 200 EM
SO₂ instrument Model: API 100 AH
CO instrument Model: API 300 A
Fuel Type : Fuel Gas and Fuel Oil

Run # : 3
Location : Main Stack
Finish time : 12:12 PM
Serial No.: 161212-14
Serial No.: 435
Serial No.: 058
Serial No.: 1070
Test Operator : Song H.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)
11:52 AM	4.57	40.50	14.72	26.75
11:53 AM	4.52	40.43	14.86	29.67
11:54 AM	4.57	40.22	14.91	30.46
11:55 AM	4.50	40.07	14.86	30.61
11:56 AM	4.47	39.92	14.74	30.76
11:57 AM	4.46	39.87	14.68	31.15
11:58 AM	4.51	39.92	14.64	32.63
11:59 AM	4.53	39.91	14.41	36.06
12:00 PM	4.45	39.84	14.32	36.48
12:01 PM	4.50	39.90	14.27	36.40
12:02 PM	4.47	40.04	14.14	36.24
12:03 PM	4.55	40.03	14.13	35.86
12:04 PM	4.56	40.09	14.13	35.07
12:05 PM	4.44	40.14	14.45	33.79
12:06 PM	4.54	40.11	14.19	32.45
12:07 PM	4.55	40.19	14.23	35.99
12:08 PM	4.58	40.47	14.35	37.87
12:09 PM	4.55	40.66	14.46	34.80
12:10 PM	4.59	40.64	14.54	30.44
12:11 PM	4.54	40.67	14.53	29.45
12:12 PM	4.48	40.68	14.71	29.29
Average	4.52	40.20	14.49	32.96

Signature



(Miss Katesarin Vorradetwittaya)

Environmental Scientist



บริษัท ซีคอต จำกัด

SECOT CO., LTD.

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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. : PTTGC6 (Refinery)_224010_Cert-Stk/CRS
Branch 6 (Refinery) SAMPLING DATE : 15/05/2024
SAMPLING BY : SECOT Co., Ltd. ANALYTICAL DATE : 18/05/2024
RECEIVED DATE : 16/05/2024 SAMPLE CONDITION : Normal
REPORT DATE : 27/05/2024 OPERATOR : Mr. Song Hangchhankun
STACK LOCATION : CRS Stack SOURCE DESCRIPTION : Combustion
FUEL TYPE : Fuel gas

STACK DESCRIPTION

Height : 100 m Gas Velocity : 4.0 m/s
Diameter : 1.66 m Flow rate ^{1/} : 321 Ncu.m/min
Temperature : 152 °C Excess Oxygen : 5.1 %

PARAMETER	UNIT	ND	RESULTS		STANDARD	REFERENCE
		Non-detectable	5.1%O ₂	7%O ₂		
TVOC	ppm	-	3.13	2.75	-	US. EPA Method 25A

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

Narisa Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

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

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

3. ^{1/} At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

The Monitoring Result of Emission Concentration

CRS Stack

PTT Global Chemical Public Company Limited

May 15, 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	5.11	5.11	25.96	25.95	22.84
2	5.08	5.06	26.87	26.86	23.57
3	5.03	4.99	26.51	26.50	23.15
Average	5.07	5.05	26.45	26.44	23.19

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	5.11	5.11	0.38	0.33	0.29
2	5.08	5.06	0.39	0.35	0.31
3	5.03	4.99	0.45	0.42	0.37
Average	5.07	5.05	0.41	0.37	0.32

Run Number	Oxygen content (%)		Carbonmonoxide (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	5.11	5.11	9.55	9.53	8.39
2	5.08	5.06	9.49	9.47	8.31
3	5.03	4.99	9.47	9.45	8.26
Average	5.07	5.05	9.50	9.48	8.32

PTT Global Chemical Public Company Limited
EMISSION TEST RESULT

Date: May 15, 2024
Start time: 11:00 AM
O₂ instrument Model: AMI 70
NO_x instrument Model: Teledyne 200 EM
SO₂ instrument Model: API 100 AH
CO instrument Model: API 300 A
Fuel Type : Fuel Gas

Run # : 1
Location : CRS Stack
Finish time : 11:20 AM
Serial No.: 161212-14
Serial No.: 435
Serial No.: 058
Serial No.: 1070
Test Operator : Song H.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)
11:00 AM	5.42	25.45	0.36	9.58
11:01 AM	5.38	25.59	0.36	9.58
11:02 AM	5.24	25.79	0.37	9.53
11:03 AM	5.07	25.72	0.37	9.54
11:04 AM	5.02	25.46	0.32	9.57
11:05 AM	5.04	25.37	0.32	9.57
11:06 AM	5.13	25.35	0.28	9.64
11:07 AM	5.08	25.40	0.28	9.63
11:08 AM	5.06	25.45	0.28	9.60
11:09 AM	5.07	25.44	0.28	9.63
11:10 AM	5.11	25.41	0.43	9.59
11:11 AM	5.03	25.56	0.41	9.57
11:12 AM	4.85	25.83	0.48	9.58
11:13 AM	4.99	26.13	0.37	9.57
11:14 AM	5.16	26.45	0.39	9.52
11:15 AM	5.17	26.77	0.46	9.49
11:16 AM	5.19	26.86	0.43	9.45
11:17 AM	5.12	26.85	0.45	9.47
11:18 AM	5.07	26.82	0.42	9.51
11:19 AM	5.00	26.75	0.48	9.51
11:20 AM	5.06	26.71	0.51	9.52
Average	5.11	25.96	0.38	9.55

Signature

(Miss Katesarin Vorradetwittaya)

Environmental Scientist

PTT Global Chemical Public Company Limited
EMISSION TEST RESULT

Date: May 15, 2024
Start time: 11:21 AM
O₂ instrument Model: AMI 70
NO_x instrument Model: Teledyne 200 EM
SO₂ instrument Model: API 100 AH
CO instrument Model: API 300 A
Fuel Type : Fuel Gas

Run # : 2
Location : CRS Stack
Finish time : 11:41 AM
Serial No.: 161212-14
Serial No.: 435
Serial No.: 058
Serial No.: 1070
Test Operator : Song H.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)
11:21 AM	5.09	26.68	0.47	9.55
11:22 AM	5.09	26.70	0.38	9.51
11:23 AM	5.16	26.79	0.36	9.51
11:24 AM	5.19	26.93	0.29	9.51
11:25 AM	5.11	26.96	0.26	9.51
11:26 AM	5.04	26.77	0.45	9.53
11:27 AM	5.12	26.66	0.34	9.57
11:28 AM	5.14	26.73	0.47	9.57
11:29 AM	5.23	26.94	0.34	9.52
11:30 AM	5.27	27.11	0.47	9.49
11:31 AM	5.11	27.21	0.60	9.44
11:32 AM	5.04	27.15	0.54	9.39
11:33 AM	5.03	27.03	0.36	9.39
11:34 AM	5.08	26.95	0.45	9.44
11:35 AM	5.07	26.99	0.51	9.45
11:36 AM	5.14	26.99	0.33	9.45
11:37 AM	5.09	27.02	0.27	9.45
11:38 AM	4.99	26.91	0.36	9.45
11:39 AM	4.97	26.65	0.33	9.45
11:40 AM	4.89	26.52	0.35	9.51
11:41 AM	4.83	26.55	0.34	9.51
Average	5.08	26.87	0.39	9.49

Signature

(Miss Katesarin Vorradetwittaya)

Environmental Scientist

PTT Global Chemical Public Company Limited

EMISSION TEST RESULT

Date: May 15, 2024
Start time: 11:42 AM
O₂ instrument Model: AMI 70
NO_x instrument Model: Teledyne 200 EM
SO₂ instrument Model: API 100 AH
CO instrument Model: API 300 A
Fuel Type : Fuel Gas

Run # : 3
Location : CRS Stack
Finish time : 12:02 PM
Serial No.: 161212-14
Serial No.: 435
Serial No.: 058
Serial No.: 1070
Test Operator : Song H.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)
11:42 AM	4.96	26.54	0.36	9.51
11:43 AM	5.02	26.55	0.43	9.51
11:44 AM	4.96	26.51	0.46	9.51
11:45 AM	4.88	26.43	0.39	9.51
11:46 AM	4.86	26.29	0.40	9.51
11:47 AM	4.99	26.28	0.40	9.51
11:48 AM	5.08	26.40	0.44	9.49
11:49 AM	5.15	26.55	0.44	9.49
11:50 AM	5.05	26.59	0.51	9.45
11:51 AM	5.09	26.65	0.50	9.45
11:52 AM	5.13	26.66	0.50	9.47
11:53 AM	5.13	26.65	0.50	9.45
11:54 AM	5.12	26.64	0.56	9.44
11:55 AM	5.14	26.68	0.56	9.44
11:56 AM	5.10	26.69	0.54	9.44
11:57 AM	5.09	26.60	0.43	9.44
11:58 AM	5.05	26.55	0.37	9.44
11:59 AM	4.90	26.45	0.51	9.44
12:00 PM	4.87	26.31	0.42	9.44
12:01 PM	5.08	26.28	0.35	9.49
12:02 PM	5.04	26.48	0.43	9.50
Average	5.03	26.51	0.45	9.47

Signature

(Miss Katesarin Vorradetwittaya)

Environmental Scientist



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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. :** PTTGC6 (Refinery)_224010_Cert-Stk/DHDS
Branch 6 (Refinery) **SAMPLING DATE :** 14/05/2024
SAMPLING BY : SECOT Co., Ltd. **ANALYTICAL DATE :** 16/05/2024
RECEIVED DATE : 16/05/2024 **SAMPLE CONDITION :** Normal
REPORT DATE : 27/05/2024 **OPERATOR :** Mr. Song Hangchhankun
STACK LOCATION : DHDS Stack **SOURCE DESCRIPTION :** Combustion
FUEL TYPE : Fuel gas

STACK DESCRIPTION

Height : 80.0 m **Gas Velocity :** 8.3 m/s
Diameter : 1.2 m **Flow rate ^{1/} :** 337 Ncu.m/min
Temperature : 165 °C **Excess Oxygen :** 4.4 %

PARAMETER	UNIT	ND	RESULTS		STANDARD	REFERENCE METHODS
		Non-detectable	4.4%O ₂	7%O ₂		
TVOC	ppm	-	3.80	3.20	-	US. EPA Method 25A

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

Narisa Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

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

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

3. ^{1/} At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.



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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. : PTTGC6 (Refinery)_224010_Cert-Stk/DHDS
Branch 6 (Refinery) SAMPLING DATE : 14/05/2024
SAMPLING BY : SECOT Co., Ltd. ANALYTICAL DATE : 15-21/05/2024
RECEIVED DATE : 16/05/2024 SAMPLE CONDITION : Normal
REPORT DATE : 27/05/2024 OPERATOR : Mr. Song Hangchewankun
STACK LOCATION : DHDS Stack SOURCE DESCRIPTION : Combustion
FUEL TYPE : Fuel gas

STACK DESCRIPTION

Height : 80.0 m Gas Velocity : 8.3 m/s
Diameter : 1.2 m Flow rate^{1/} : 337 Ncu.m/min
Temperature : 165 °C Excess Oxygen : 4.4 %

PARAMETER	UNIT	ND	RESULTS		STANDARD	REFERENCE
		Non-detectable	4.4% O ₂	7% O ₂		
Lead	mg/m ³	<0.02	ND	ND	-	US. EPA Method 29
Mercury	mg/m ³	<0.0003	ND	ND	-	US. EPA Method 29

(Miss Krisana Chanthoom)

Analyst

REG.NO.จ-239-ก-0017

(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO.จ-239-ก-0010

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

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3. ^{1/} At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

The Monitoring Result of Emission Concentration DHDS Stack PTT Global Chemical Public Company Limited May 14, 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	4.43	4.44	25.70	25.68	21.69
2	4.36	4.37	25.83	25.81	21.70
3	4.42	4.43	25.93	25.91	21.87
Average	4.40	4.41	25.82	25.80	21.75

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	4.43	4.44	0.80	0.74	0.62
2	4.36	4.37	0.84	0.78	0.66
3	4.42	4.43	0.83	0.77	0.65
Average	4.40	4.41	0.83	0.76	0.64

Run Number	Oxygen content (%)		Carbonmonoxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	4.43	4.44	1.00	0.96	0.81
2	4.36	4.37	0.85	0.81	0.68
3	4.42	4.43	0.82	0.78	0.66
Average	4.40	4.41	0.89	0.85	0.72

PTT Global Chemical Public Company Limited
EMISSION TEST RESULT

Date: May 14, 2024
Start time: 2:40 PM
O₂ instrument Model: AMI 70
NO_x instrument Model: API 200 AH
SO₂ instrument Model: API 100 AH
CO instrument Model: THERMO 48 C
Fuel Type : Fuel Gas

Run # : 1
Location : DHDS Stack
Finish time : 3:00 PM
Serial No.: 071023-47
Serial No.: 441
Serial No.: 060
Serial No.: 388
Test Operator : Kittipong T.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)
2:40 PM	4.49	25.34	0.75	1.02
2:41 PM	4.54	25.51	0.73	1.08
2:42 PM	4.53	25.71	0.76	1.12
2:43 PM	4.47	25.79	0.74	1.06
2:44 PM	4.40	25.76	0.79	1.12
2:45 PM	4.43	25.66	0.81	1.07
2:46 PM	4.48	25.78	0.81	1.02
2:47 PM	4.42	25.93	0.85	1.02
2:48 PM	4.35	25.81	0.82	1.00
2:49 PM	4.35	25.65	0.87	0.93
2:50 PM	4.41	25.49	0.79	1.01
2:51 PM	4.43	25.66	0.83	1.01
2:52 PM	4.44	25.80	0.83	1.02
2:53 PM	4.47	25.96	0.83	1.02
2:54 PM	4.42	25.87	0.81	0.96
2:55 PM	4.41	25.67	0.77	0.92
2:56 PM	4.38	25.53	0.78	0.92
2:57 PM	4.38	25.56	0.79	0.92
2:58 PM	4.39	25.67	0.83	0.92
2:59 PM	4.40	25.74	0.87	0.92
3:00 PM	4.41	25.87	0.82	0.92
Average	4.43	25.70	0.80	1.00

Signature



(Miss Katesarin Vorradetwittaya)

Environmental Scientist

PTT Global Chemical Public Company Limited
EMISSION TEST RESULT

Date: May 14, 2024
Start time: 3:01 PM
O₂ instrument Model: AMI 70
NO_x instrument Model: API 200 AH
SO₂ instrument Model: API 100 AH
CO instrument Model: THERMO 48 C
Fuel Type : Fuel Gas

Run # : 2
Location : DHDS Stack
Finish time : 3:21 PM
Serial No.: 071023-47
Serial No.: 441
Serial No.: 060
Serial No.: 388
Test Operator : Kittipong T.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)
3:01 PM	4.34	25.85	0.90	0.92
3:02 PM	4.35	25.73	0.86	0.92
3:03 PM	4.31	25.80	0.82	0.92
3:04 PM	4.31	25.78	0.87	0.90
3:05 PM	4.32	25.66	0.89	0.83
3:06 PM	4.36	25.72	0.88	0.83
3:07 PM	4.40	25.83	0.82	0.83
3:08 PM	4.40	26.02	0.83	0.83
3:09 PM	4.41	25.91	0.81	0.83
3:10 PM	4.44	25.99	0.84	0.83
3:11 PM	4.43	25.93	0.81	0.83
3:12 PM	4.40	25.97	0.79	0.83
3:13 PM	4.33	25.80	0.86	0.92
3:14 PM	4.37	25.69	0.85	0.92
3:15 PM	4.41	25.85	0.88	0.89
3:16 PM	4.40	26.07	0.84	0.83
3:17 PM	4.33	25.93	0.80	0.83
3:18 PM	4.31	25.76	0.79	0.83
3:19 PM	4.31	25.61	0.88	0.83
3:20 PM	4.33	25.65	0.83	0.83
3:21 PM	4.37	25.87	0.79	0.77
Average	4.36	25.83	0.84	0.85

Signature



(Miss Katesarin Vorradetwittaya)

Environmental Scientist

PTT Global Chemical Public Company Limited

EMISSION TEST RESULT

Date: May 14, 2024
Start time: 3:22 PM
O₂ instrument Model: AMI 70
NO_x instrument Model: API 200 AH
SO₂ instrument Model: API 100 AH
CO instrument Model: THERMO 48 C
Fuel Type : Fuel Gas

Run # : 3
Location : DHDS Stack
Finish time : 3:42 PM
Serial No.: 071023-47
Serial No.: 441
Serial No.: 060
Serial No.: 388
Test Operator : Kittipong T.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)
3:22 PM	4.31	25.91	0.83	0.83
3:23 PM	4.27	25.62	0.87	0.83
3:24 PM	4.36	25.55	0.82	0.83
3:25 PM	4.44	25.76	0.81	0.82
3:26 PM	4.54	26.06	0.84	0.82
3:27 PM	4.53	26.18	0.80	0.82
3:28 PM	4.52	26.09	0.80	0.72
3:29 PM	4.49	26.06	0.81	0.81
3:30 PM	4.44	25.92	0.78	0.82
3:31 PM	4.44	25.91	0.82	0.82
3:32 PM	4.38	25.84	0.80	0.82
3:33 PM	4.35	25.93	0.83	0.82
3:34 PM	4.39	25.84	0.83	0.82
3:35 PM	4.41	25.99	0.84	0.82
3:36 PM	4.40	25.95	0.84	0.82
3:37 PM	4.45	26.09	0.86	0.82
3:38 PM	4.44	26.02	0.89	0.82
3:39 PM	4.44	26.10	0.88	0.82
3:40 PM	4.43	26.08	0.88	0.82
3:41 PM	4.36	25.90	0.84	0.82
3:42 PM	4.35	25.74	0.80	0.82
Average	4.42	25.93	0.83	0.82

Signature

(Miss Katesarin Vorradetwittaya)

Environmental Scientist



บริษัท ซีคอต จำกัด

SECOT CO., LTD.

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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. :** PTTGC6 (Refinery)_224010_Cert-Stk/HCU
Branch 6 (Refinery) **SAMPLING DATE :** 13/05/2024
SAMPLING BY : SECOT Co., Ltd. **ANALYTICAL DATE :** 18/05/2024
RECEIVED DATE : 16/05/2024 **SAMPLE CONDITION :** Normal
REPORT DATE : 27/05/2024 **OPERATOR :** Mr. Song Hangchwanun
STACK LOCATION : HCU Stack **SOURCE DESCRIPTION :** Combustion
FUEL TYPE : Fuel gas

STACK DESCRIPTION

Height : 61.0 m **Gas Velocity :** 9.9 m/s
Diameter : 1.7 m **Flow rate ^{1/} :** 724 Ncu.m/min
Temperature : 224 °C **Excess Oxygen :** 2.3 %

PARAMETER	UNIT	ND	RESULTS		STANDARD	REFERENCE METHODS
		Non-detectable	2.3%O ₂	7%O ₂		
TVOC	ppm	-	0.94	0.70	-	US. EPA Method 25A

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

Narisa Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

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

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

3. ^{1/} At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

The Monitoring Result of Emission Concentration
HCU Stack
PTT Global Chemical Public Company Limited
May 13, 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	2.49	2.48	33.79	33.78	25.49
2	2.32	2.31	36.85	36.85	27.55
3	2.27	2.25	37.02	37.02	27.59
Average	2.36	2.35	35.89	35.88	26.88

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	2.49	2.48	1.77	1.73	1.31
2	2.32	2.31	1.62	1.57	1.17
3	2.27	2.25	1.49	1.44	1.07
Average	2.36	2.35	1.63	1.58	1.18

Run Number	Oxygen content (%)		Carbonmonoxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	2.49	2.48	0.10	0.07	0.05
2	2.32	2.31	0.07	0.03	0.02
3	2.27	2.25	0.09	0.05	0.04
Average	2.36	2.35	0.09	0.05	0.04

PTT Global Chemical Public Company Limited
EMISSION TEST RESULT

Date: May 13, 2024
 Start time: 1:50 PM
 O₂ instrument Model: AMI 70
 NO_x instrument Model: API 200 AH
 SO₂ instrument Model: API 100 AH
 CO instrument Model: THERMO 48 C
 Fuel Type : Fuel Gas

Run # : 1
 Location : HCU Stack
 Finish time : 2:10 PM
 Serial No.: 071023-47
 Serial No.: 441
 Serial No.: 060
 Serial No.: 388
 Test Operator : Kittipong T.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)
1:50 PM	2.31	27.75	2.06	0.35
1:51 PM	2.56	28.53	1.93	0.20
1:52 PM	2.61	30.41	1.89	0.12
1:53 PM	2.42	31.46	1.86	0.08
1:54 PM	2.47	30.84	1.83	0.02
1:55 PM	2.50	32.02	1.81	0.02
1:56 PM	2.64	33.55	1.80	0.02
1:57 PM	2.61	34.31	1.75	0.07
1:58 PM	2.57	34.57	1.78	0.08
1:59 PM	2.59	35.00	1.74	0.08
2:00 PM	2.71	35.39	1.71	0.08
2:01 PM	2.64	35.88	1.78	0.08
2:02 PM	2.49	36.06	1.75	0.08
2:03 PM	2.51	35.17	1.70	0.08
2:04 PM	2.41	35.03	1.70	0.08
2:05 PM	2.43	35.01	1.70	0.08
2:06 PM	2.45	35.94	1.67	0.08
2:07 PM	2.54	35.85	1.65	0.09
2:08 PM	2.35	36.38	1.65	0.16
2:09 PM	2.20	35.97	1.67	0.08
2:10 PM	2.36	34.45	1.68	0.08
Average	2.49	33.79	1.77	0.10

Signature



(Miss Katesarin Vorradetwittaya)

Environmental Scientist

PTT Global Chemical Public Company Limited
EMISSION TEST RESULT

Date: May 13, 2024
 Start time: 2:11 PM
 O₂ instrument Model: AMI 70
 NO_x instrument Model: API 200 AH
 SO₂ instrument Model: API 100 AH
 CO instrument Model: THERMO 48 C
 Fuel Type : Fuel Gas

Run # : 2
 Location : HCU Stack
 Finish time : 2:31 PM
 Serial No.: 071023-47
 Serial No.: 441
 Serial No.: 060
 Serial No.: 388
 Test Operator : Kittipong T.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)
2:11 PM	2.43	35.16	1.70	0.08
2:12 PM	2.39	36.35	1.68	0.08
2:13 PM	2.50	37.14	1.63	0.09
2:14 PM	2.36	37.62	1.66	0.09
2:15 PM	2.24	36.15	1.63	0.09
2:16 PM	2.27	36.72	1.62	0.09
2:17 PM	2.30	37.21	1.61	0.12
2:18 PM	2.28	36.92	1.64	0.09
2:19 PM	2.26	36.82	1.70	0.09
2:20 PM	2.35	37.01	1.67	0.09
2:21 PM	2.49	37.64	1.63	0.09
2:22 PM	2.36	37.67	1.61	0.09
2:23 PM	2.42	37.17	1.62	0.09
2:24 PM	2.38	37.51	1.64	0.09
2:25 PM	2.37	37.14	1.61	0.09
2:26 PM	2.21	37.24	1.59	0.08
2:27 PM	2.12	36.10	1.56	0.00
2:28 PM	2.18	35.81	1.58	0.01
2:29 PM	2.16	36.46	1.49	0.01
2:30 PM	2.36	36.98	1.59	0.00
2:31 PM	2.19	37.11	1.56	0.09
Average	2.32	36.85	1.62	0.07

Signature



(Miss Katesarin Vorradetwittaya)

Environmental Scientist

PTT Global Chemical Public Company Limited
EMISSION TEST RESULT

Date: May 13, 2024
 Start time: 2:32 PM
 O₂ instrument Model: AMI 70
 NO_x instrument Model: API 200 AH
 SO₂ instrument Model: API 100 AH
 CO instrument Model: THERMO 48 C
 Fuel Type : Fuel Gas

Run # : 3
 Location : HCU Stack
 Finish time : 2:52 PM
 Serial No.: 071023-47
 Serial No.: 441
 Serial No.: 060
 Serial No.: 388
 Test Operator : Kittipong T.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)
2:32 PM	2.21	36.67	1.51	0.09
2:33 PM	2.15	36.96	1.48	0.09
2:34 PM	2.12	36.43	1.48	0.09
2:35 PM	2.38	35.95	1.50	0.09
2:36 PM	2.09	37.05	1.49	0.09
2:37 PM	2.12	36.16	1.50	0.07
2:38 PM	2.14	36.08	1.51	0.04
2:39 PM	2.22	36.69	1.51	0.09
2:40 PM	2.34	37.00	1.49	0.09
2:41 PM	2.34	37.55	1.49	0.09
2:42 PM	2.24	37.95	1.56	0.09
2:43 PM	2.22	37.38	1.53	0.09
2:44 PM	2.29	37.06	1.46	0.09
2:45 PM	2.32	36.99	1.44	0.09
2:46 PM	2.43	37.20	1.48	0.09
2:47 PM	2.32	37.89	1.48	0.09
2:48 PM	2.06	36.95	1.51	0.09
2:49 PM	2.16	35.70	1.47	0.09
2:50 PM	2.42	36.27	1.46	0.09
2:51 PM	2.51	38.17	1.47	0.09
2:52 PM	2.66	39.41	1.50	0.09
Average	2.27	37.02	1.49	0.09

Signature



(Miss Katesarin Vorradetwittaya)

Environmental Scientist



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. : PTTGC6 (Refinery)_224010_Cert-Stk/HMU
Branch 6 (Refinery) SAMPLING DATE : 14/05/2024
SAMPLING BY : SECOT Co., Ltd. ANALYTICAL DATE : 18/05/2024
RECEIVED DATE : 16/05/2024 SAMPLE CONDITION : Normal
REPORT DATE : 27/05/2024 OPERATOR : Mr. Song Hanghchwankun
STACK LOCATION : HMU Stack SOURCE DESCRIPTION : Combustion
FUEL TYPE : Fuel gas

STACK DESCRIPTION

Height : 60.0 m Gas Velocity : 10.6 m/s
Diameter : 2.4 m Flow rate ^{1/} : 1,706 Ncu.m/min
Temperature : 163 °C Excess Oxygen : 5.5 %

PARAMETER	UNIT	ND	RESULTS		STANDARD	REFERENCE METHODS
		Non-detectable	5.5%O ₂	7%O ₂		
TVOC	ppm	-	10.43	9.39	-	US. EPA Method 25A

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

Narisa Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

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

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

3. ^{1/} At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

The Monitoring Result of Emission Concentration HMU Stack PTT Global Chemical Public Company Limited May 14, 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	5.47	5.44	31.83	31.83	28.62
2	5.41	5.40	32.08	32.08	28.77
3	5.51	5.52	32.25	32.25	29.15
Average	5.47	5.45	32.05	32.05	28.84

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	5.47	5.44	0.13	0.07	0.06
2	5.41	5.40	0.11	0.06	0.05
3	5.51	5.52	0.14	0.10	0.09
Average	5.47	5.45	0.12	0.08	0.07

Run Number	Oxygen content (%)		Carbonmonoxide (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	5.47	5.44	0.56	0.54	0.49
2	5.41	5.40	0.55	0.52	0.47
3	5.51	5.52	0.54	0.5	0.45
Average	5.47	5.45	0.55	0.52	0.47

PTT Global Chemical Public Company Limited
EMISSION TEST RESULT

Date: May 14, 2024	Run # : 1
Start time: 2:10 PM	Location : HMU Stack
O₂ instrument Model: AMI 70	Finish time : 2:30 PM
NO_x instrument Model: Teledyne 200 EM	Serial No.: 161212-14
SO₂ instrument Model: API 100 AH	Serial No.: 435
CO instrument Model: API 300 A	Serial No.: 058
Fuel Type : Fuel Gas	Serial No.: 1070
	Test Operator : Song H.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)
2:10 PM	5.45	32.04	0.12	0.56
2:11 PM	5.31	32.17	0.12	0.56
2:12 PM	5.61	31.98	0.12	0.56
2:13 PM	5.42	31.86	0.12	0.56
2:14 PM	5.70	31.76	0.12	0.56
2:15 PM	5.56	31.71	0.12	0.56
2:16 PM	5.58	31.71	0.12	0.56
2:17 PM	5.47	31.73	0.12	0.56
2:18 PM	5.53	31.76	0.12	0.56
2:19 PM	5.52	31.69	0.12	0.56
2:20 PM	5.27	31.79	0.12	0.56
2:21 PM	5.48	31.82	0.16	0.55
2:22 PM	5.49	31.81	0.13	0.55
2:23 PM	5.44	31.89	0.13	0.55
2:24 PM	5.54	31.97	0.13	0.55
2:25 PM	5.47	31.89	0.13	0.55
2:26 PM	5.44	31.86	0.15	0.55
2:27 PM	5.34	31.86	0.15	0.58
2:28 PM	5.36	31.73	0.15	0.55
2:29 PM	5.42	31.71	0.09	0.55
2:30 PM	5.44	31.75	0.10	0.55
Average	5.47	31.83	0.13	0.56

Signature 


(Miss Katesarin Vorradetwittaya)

Environmental Scientist

PTT Global Chemical Public Company Limited
EMISSION TEST RESULT

Date: May 14, 2024	Run # : 2
Start time: 2:31 PM	Location : HMU Stack
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
CO instrument Model: API 300 A	Serial No.: 058
Fuel Type : Fuel Gas	Serial No.: 1070
	Test Operator : Song H.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)
2:31 PM	5.37	31.68	0.09	0.57
2:32 PM	5.46	31.77	0.10	0.59
2:33 PM	5.34	32.10	0.10	0.56
2:34 PM	5.39	32.22	0.10	0.55
2:35 PM	5.25	32.24	0.10	0.55
2:36 PM	5.33	32.15	0.11	0.54
2:37 PM	5.18	32.08	0.11	0.54
2:38 PM	5.36	31.89	0.11	0.58
2:39 PM	5.20	31.81	0.11	0.55
2:40 PM	5.42	31.99	0.11	0.54
2:41 PM	5.35	32.14	0.11	0.54
2:42 PM	5.46	32.34	0.11	0.54
2:43 PM	5.37	32.50	0.11	0.54
2:44 PM	5.64	32.51	0.12	0.54
2:45 PM	5.45	32.22	0.12	0.55
2:46 PM	5.46	32.02	0.12	0.56
2:47 PM	5.47	31.93	0.12	0.57
2:48 PM	5.41	31.91	0.12	0.54
2:49 PM	5.45	32.04	0.12	0.54
2:50 PM	5.67	32.07	0.12	0.54
2:51 PM	5.64	32.03	0.12	0.54
Average	5.41	32.08	0.11	0.55

Signature 

(Miss Katesarin Vorradetwittaya)

Environmental Scientist

PTT Global Chemical Public Company Limited

EMISSION TEST RESULT

Date: May 14, 2024

Start time: 2:52 PM

O₂ instrument Model: AMI 70NO_x instrument Model: Teledyne 200 EMSO₂ instrument Model: API 100 AH

CO instrument Model: API 300 A

Fuel Type : Fuel Gas

Run # : 3

Location : HMU Stack

Finish time : 3:12 PM

Serial No.: 161212-14

Serial No.: 435

Serial No.: 058

Serial No.: 1070

Test Operator : Song H.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)
2:52 PM	5.47	32.06	0.12	0.54
2:53 PM	5.44	32.05	0.14	0.54
2:54 PM	5.63	31.97	0.13	0.54
2:55 PM	5.46	31.85	0.13	0.54
2:56 PM	5.67	31.81	0.13	0.54
2:57 PM	5.69	31.94	0.13	0.54
2:58 PM	5.67	31.99	0.13	0.54
2:59 PM	5.44	32.14	0.13	0.55
3:00 PM	5.57	32.21	0.13	0.54
3:01 PM	5.51	32.43	0.13	0.54
3:02 PM	5.50	32.57	0.14	0.53
3:03 PM	5.32	32.59	0.16	0.54
3:04 PM	5.53	32.57	0.16	0.54
3:05 PM	5.34	32.61	0.14	0.54
3:06 PM	5.60	32.49	0.14	0.54
3:07 PM	5.48	32.27	0.14	0.54
3:08 PM	5.57	32.29	0.14	0.54
3:09 PM	5.43	32.33	0.18	0.54
3:10 PM	5.46	32.32	0.16	0.54
3:11 PM	5.53	32.34	0.12	0.53
3:12 PM	5.48	32.43	0.12	0.54
Average	5.51	32.25	0.14	0.54

Signature

(Miss Katesarin Vorradetwittaya)

Environmental Scientist



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. : PTTGC6 (Refinery)_224010_Cert-Stk/GT1

Branch 6 (Refinery) SAMPLING DATE : 13/05/2024

SAMPLING BY : SECOT Co., Ltd. ANALYTICAL DATE : 16-17/05/2024

RECEIVED DATE : 16/05/2024 SAMPLE CONDITION : Normal

REPORT DATE : 24/05/2024 OPERATOR : Mr. Song Hanghchwankun

STACK LOCATION : Gas Turbine 1 SOURCE DESCRIPTION : Combustion

FUEL TYPE : Natural Gas

STACK DESCRIPTION

Height : 60.0 m Gas Velocity : 13.1 m/s

Diameter : 2.5 m Flow rate ^{1/} : 2,248 Ncu.m/min

Temperature : 181 °C Excess Oxygen : 12.2 %

PARAMETER	UNIT	RESULTS		STANDARD ^{2/}	REFERENCE METHODS
		12.2%O ₂	7%O ₂		
Particulate Matter	mg/Ncu.m	2.05	3.28	60.0	US. EPA Method 5

Phatchara Samanchan

(Miss Phatchara Samanchan)

Analyst

REG.NO. 2-239-ก-0021

Narisa Poowanapetch

(Miss Narisa Poowanapetch)

Technical Management Team

REG.NO. 2-239-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. ^{1/} At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.4. ^{2/} Notification of the Ministry of Natural Resources and Environment B.E.2554.

The Monitoring Result of Emission Concentration
GAS Turbine 1
PTT Global Chemical Public Company Limited
May 13, 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	12.23	12.29	27.89	27.87	44.99
2	12.12	12.18	26.87	26.85	42.80
3	12.05	12.12	26.64	26.62	42.14
Average	12.13	12.20	27.13	27.11	43.30

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	12.23	12.29	0.25	0.21	0.34
2	12.12	12.18	0.21	0.17	0.27
3	12.05	12.12	0.12	0.08	0.13
Average	12.13	12.20	0.19	0.15	0.24

Run Number	Oxygen content (%)		Carbonmonoxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	12.23	12.29	38.81	38.81	62.65
2	12.12	12.18	34.17	34.16	54.45
3	12.05	12.12	30.01	30.00	47.49
Average	12.13	12.20	34.33	34.32	54.82

PTT Global Chemical Public Company Limited
EMISSION TEST RESULT

Date: May 13, 2024
 Start time: 11:25 AM
 O₂ instrument Model: AMI 70
 NO_x instrument Model: API 200 AH
 SO₂ instrument Model: API 100 AH
 CO instrument Model: THERMO 48 C
 Fuel Type : Natural Gas

Run # : 1
 Location : GAS Turbine 1
 Finish time : 11:45 AM
 Serial No.: 071023-47
 Serial No.: 441
 Serial No.: 060
 Serial No.: 388
 Test Operator : Kittipong T.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)
11:25 AM	12.20	28.79	0.08	33.46
11:26 AM	12.21	28.57	0.13	34.54
11:27 AM	12.23	28.57	0.08	35.76
11:28 AM	12.26	28.73	0.16	36.89
11:29 AM	12.26	28.62	0.23	38.03
11:30 AM	12.27	27.82	0.23	40.12
11:31 AM	12.24	27.74	0.24	38.92
11:32 AM	12.26	27.93	0.36	39.19
11:33 AM	12.27	27.89	0.46	39.61
11:34 AM	12.31	27.99	0.42	40.24
11:35 AM	12.25	27.93	0.38	40.35
11:36 AM	12.24	27.72	0.27	40.66
11:37 AM	12.25	27.65	0.22	40.79
11:38 AM	12.26	27.59	0.15	40.97
11:39 AM	12.25	27.55	0.24	40.91
11:40 AM	12.21	27.50	0.43	40.76
11:41 AM	12.20	27.44	0.29	40.35
11:42 AM	12.20	27.33	0.27	39.78
11:43 AM	12.18	27.45	0.16	39.15
11:44 AM	12.13	27.40	0.17	38.03
11:45 AM	12.07	27.42	0.20	36.54
Average	12.23	27.89	0.25	38.81

Signature



(Miss Katesarin Vorradetwittaya)

Environmental Scientist

PTT Global Chemical Public Company Limited
EMISSION TEST RESULT

Date: May 13, 2024
Start time: 11:46 AM
O₂ instrument Model: AMI 70
NO_x instrument Model: API 200 AH
SO₂ instrument Model: API 100 AH
CO instrument Model: THERMO 48 C
Fuel Type : Natural Gas

Run # : 2
Location : GAS Turbine 1
Finish time : 12:06 PM
Serial No.: 071023-47
Serial No.: 441
Serial No.: 060
Serial No.: 388
Test Operator : Kittipong T.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)
11:46 AM	12.08	27.64	0.17	35.64
11:47 AM	12.06	27.44	0.17	33.98
11:48 AM	12.05	27.38	0.31	32.46
11:49 AM	12.08	27.33	0.36	31.53
11:50 AM	12.08	27.32	0.26	31.42
11:51 AM	12.09	27.22	0.28	31.41
11:52 AM	12.07	27.15	0.21	31.67
11:53 AM	12.08	27.09	0.15	31.98
11:54 AM	12.07	26.98	0.20	32.34
11:55 AM	12.13	26.82	0.17	32.53
11:56 AM	12.15	26.75	0.09	33.14
11:57 AM	12.18	26.60	0.04	34.03
11:58 AM	12.19	26.52	0.17	35.14
11:59 AM	12.14	26.56	0.22	36.02
12:00 PM	12.12	26.39	0.24	36.29
12:01 PM	12.17	26.41	0.23	36.48
12:02 PM	12.20	26.46	0.09	36.82
12:03 PM	12.18	26.61	0.15	36.72
12:04 PM	12.14	26.57	0.37	36.11
12:05 PM	12.15	26.58	0.31	35.96
12:06 PM	12.19	26.55	0.19	35.82
Average	12.12	26.87	0.21	34.17

Signature 
 (Miss Katesarin Vorradetwittaya)
 Environmental Scientist

PTT Global Chemical Public Company Limited
EMISSION TEST RESULT

Date: May 13, 2024
Start time: 12:07 PM
O₂ instrument Model: AMI 70
NO_x instrument Model: API 200 AH
SO₂ instrument Model: API 100 AH
CO instrument Model: THERMO 48 C
Fuel Type : Natural Gas

Run # : 3
Location : GAS Turbine 1
Finish time : 12:27 PM
Serial No.: 071023-47
Serial No.: 441
Serial No.: 060
Serial No.: 388
Test Operator : Kittipong T.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)
12:07 PM	12.23	26.38	0.13	35.82
12:08 PM	12.22	26.17	0.24	36.08
12:09 PM	12.17	26.06	0.10	36.43
12:10 PM	12.17	26.18	0.22	36.38
12:11 PM	12.17	26.38	0.20	36.28
12:12 PM	12.12	26.32	0.23	35.60
12:13 PM	12.07	26.36	0.00	34.04
12:14 PM	12.05	26.46	0.02	32.71
12:15 PM	12.05	26.62	0.09	31.69
12:16 PM	12.00	26.63	0.16	30.21
12:17 PM	12.01	26.64	0.08	28.67
12:18 PM	11.97	26.90	0.07	27.71
12:19 PM	11.95	26.93	0.17	26.67
12:20 PM	11.95	27.01	0.14	25.71
12:21 PM	11.99	27.08	0.15	25.20
12:22 PM	11.98	27.19	0.07	24.88
12:23 PM	11.98	27.09	0.09	24.71
12:24 PM	11.99	26.96	0.12	24.93
12:25 PM	12.00	26.85	0.02	25.32
12:26 PM	11.99	26.67	0.15	25.52
12:27 PM	11.98	26.58	0.11	25.67
Average	12.05	26.64	0.12	30.01

Signature 
 (Miss Katesarin Vorradetwittaya)
 Environmental Scientist



บริษัท ซีคอต จำกัด
SECOT CO., LTD.

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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. : PTTGC6 (Refinery)_224010_Cert-Stk/GT2
Branch 6 (Refinery) SAMPLING DATE : 26/06/2024
SAMPLING BY : SECOT Co., Ltd. ANALYTICAL DATE : 27-28/06/2024
RECEIVED DATE : 27/06/2024 SAMPLE CONDITION : Normal
REPORT DATE : 02/07/2024 OPERATOR : Mr. Song Hanghchwankun
STACK LOCATION : Gas Turbine 2 SOURCE DESCRIPTION : Combustion
FUEL TYPE : Natural Gas

STACK DESCRIPTION

Height : 60.0 m Gas Velocity : 17.9 m/s
Diameter : 2.5 m Flow rate^{1/} : 2,888 Ncu.m/min
Temperature : 204 °C Excess Oxygen : 13.4 %

PARAMETER	UNIT	RESULTS		STANDARD ^{2/}	REFERENCE METHODS
		13.4%O ₂	7%O ₂		
Particulate Matter	mg/Ncu.m	3.24	5.98	60.0	US. EPA Method 5

Phatchara Samanchan
(Miss Phatchara Samanchan)

Analyst

REG.NO.7-239-9-0021

Narisa Poowasanpetch
(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO.7-239-R-0010

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

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

3. ^{1/} At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. ^{2/} Notification of the Ministry of Natural Resources and Environment B.E.2554.

The Monitoring Result of Emission Concentration
GAS Turbine 2
PTT Global Chemical Public Company Limited
June 26, 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	13.33	13.33	9.53	9.49	17.43
2	13.41	13.41	9.41	9.38	17.41
3	13.41	13.41	9.43	9.40	17.44
Average	13.38	13.38	9.46	9.42	17.43

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	13.33	13.33	0.16	0.13	0.24
2	13.41	13.41	0.15	0.11	0.20
3	13.41	13.41	0.15	0.10	0.19
Average	13.38	13.38	0.15	0.11	0.21

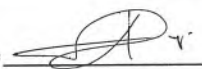
Run Number	Oxygen content (%)		Carbonmonoxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	13.33	13.33	174.06	174.19	319.85
2	13.41	13.41	173.33	173.46	321.91
3	13.41	13.41	173.06	173.18	321.39
Average	13.38	13.38	173.48	173.61	321.04

PTT Global Chemical Public Company Limited
EMISSION TEST RESULT

Date: June 26, 2024
 Start time: 10:40 AM
 O₂ instrument Model: AMI 70
 NO_x instrument Model: Teledyne 200 EM
 SO₂ instrument Model: API 100 AH
 CO instrument Model: API 300 A
 Fuel Type : Natural Gas

Run # : 1
 Location : GAS Turbine 2
 Finish time : 11:00 AM
 Serial No.: 161212-14
 Serial No.: 435
 Serial No.: 058
 Serial No.: 1070
 Test Operator : Song H.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)
10:40 AM	13.31	9.51	0.16	179.32
10:41 AM	13.32	9.43	0.16	178.04
10:42 AM	13.30	9.47	0.16	174.84
10:43 AM	13.31	9.56	0.14	172.60
10:44 AM	13.30	9.62	0.16	170.68
10:45 AM	13.33	9.65	0.14	170.68
10:46 AM	13.33	9.61	0.14	171.96
10:47 AM	13.33	9.59	0.16	172.60
10:48 AM	13.31	9.52	0.14	173.88
10:49 AM	13.30	9.52	0.14	175.48
10:50 AM	13.31	9.49	0.14	175.80
10:51 AM	13.33	9.57	0.16	175.16
10:52 AM	13.32	9.56	0.16	173.88
10:53 AM	13.31	9.44	0.16	173.24
10:54 AM	13.32	9.42	0.16	172.92
10:55 AM	13.30	9.45	0.16	173.88
10:56 AM	13.32	9.53	0.17	173.88
10:57 AM	13.32	9.60	0.17	173.88
10:58 AM	13.41	9.62	0.16	173.88
10:59 AM	13.41	9.52	0.16	173.88
11:00 AM	13.42	9.39	0.16	174.84
Average	13.33	9.53	0.16	174.06

Signature 
 (Miss Katesarin Vorradetwittaya)
 Environmental Scientist

PTT Global Chemical Public Company Limited
EMISSION TEST RESULT

Date: June 26, 2024
 Start time: 11:01 AM
 O₂ instrument Model: AMI 70
 NO_x instrument Model: Teledyne 200 EM
 SO₂ instrument Model: API 100 AH
 CO instrument Model: API 300 A
 Fuel Type : Natural Gas

Run # : 2
 Location : GAS Turbine 2
 Finish time : 11:21 AM
 Serial No.: 161212-14
 Serial No.: 435
 Serial No.: 058
 Serial No.: 1070
 Test Operator : Song H.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)
11:01 AM	13.41	9.51	0.14	174.84
11:02 AM	13.44	9.75	0.16	173.88
11:03 AM	13.41	9.76	0.14	173.88
11:04 AM	13.43	9.49	0.14	173.88
11:05 AM	13.41	9.34	0.16	173.88
11:06 AM	13.40	9.32	0.16	173.88
11:07 AM	13.41	9.28	0.14	173.56
11:08 AM	13.40	9.32	0.14	172.60
11:09 AM	13.41	9.22	0.14	172.92
11:10 AM	13.40	9.42	0.14	172.92
11:11 AM	13.43	9.60	0.14	172.28
11:12 AM	13.42	9.31	0.14	171.00
11:13 AM	13.40	9.36	0.16	171.00
11:14 AM	13.39	9.38	0.16	172.28
11:15 AM	13.40	9.32	0.16	172.92
11:16 AM	13.40	9.34	0.16	173.88
11:17 AM	13.42	9.36	0.16	175.48
11:18 AM	13.42	9.33	0.16	175.80
11:19 AM	13.41	9.54	0.17	175.80
11:20 AM	13.41	9.33	0.16	173.24
11:21 AM	13.42	9.36	0.17	170.04
Average	13.41	9.41	0.15	173.33

Signature 
 (Miss Katesarin Vorradetwittaya)
 Environmental Scientist

PTT Global Chemical Public Company Limited

EMISSION TEST RESULT

Date: June 26, 2024
Start time: 11:22 AM
O₂ instrument Model: AMI 70
NO_x instrument Model: Teledyne 200 EM
SO₂ instrument Model: API 100 AH
CO instrument Model: API 300 A
Fuel Type: Natural Gas

Run #: 3
Location: GAS Turbine 2
Finish time: 11:42 AM
Serial No.: 161212-14
Serial No.: 435
Serial No.: 058
Serial No.: 1070
Test Operator: Song H.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)
11:22 AM	13.41	9.38	0.18	168.12
11:23 AM	13.42	9.40	0.17	167.80
11:24 AM	13.41	9.57	0.16	169.08
11:25 AM	13.43	9.57	0.16	168.44
11:26 AM	13.41	9.47	0.14	167.16
11:27 AM	13.43	9.51	0.16	165.56
11:28 AM	13.41	9.62	0.16	166.20
11:29 AM	13.41	9.58	0.16	168.44
11:30 AM	13.41	9.52	0.14	170.36
11:31 AM	13.42	9.59	0.13	172.92
11:32 AM	13.43	9.48	0.16	174.84
11:33 AM	13.41	9.20	0.14	177.08
11:34 AM	13.40	9.27	0.13	179.00
11:35 AM	13.40	9.38	0.14	179.32
11:36 AM	13.42	9.41	0.14	180.28
11:37 AM	13.42	9.28	0.16	179.96
11:38 AM	13.40	9.37	0.16	179.32
11:39 AM	13.41	9.47	0.16	177.40
11:40 AM	13.42	9.47	0.16	175.16
11:41 AM	13.42	9.29	0.15	174.20
11:42 AM	13.41	9.29	0.16	173.54
Average	13.41	9.43	0.15	173.06

Signature

(Miss Katesarin Vorradetwittaya)

Environmental Scientist



บริษัท ซีคอต จำกัด

SECOT CO., LTD.

239 ถนนวิมลคลองประปา 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.** : PTTGC6 (Refinery)_224010_Cert-Stk/GT3
Branch 6 (Refinery) **SAMPLING DATE** : 14/05/2024
SAMPLING BY : SECOT Co., Ltd. **ANALYTICAL DATE** : 16-17/05/2024
RECEIVED DATE : 16/05/2024 **SAMPLE CONDITION** : Normal
REPORT DATE : 24/05/2024 **OPERATOR** : Mr. Song Hanghchwankun
STACK LOCATION : Gas Turbine 3 **SOURCE DESCRIPTION** : Combustion
FUEL TYPE : Natural Gas

STACK DESCRIPTION

Height : 60.0 m **Gas Velocity** : 16.1 m/s
Diameter : 2.5 m **Flow rate^{1/}** : 2,854 Ncu.m/min
Temperature : 171 °C **Excess Oxygen** : 7.9 %

PARAMETER	UNIT	RESULTS		STANDARD ^{2/}	REFERENCE METHODS
		7.9%O ₂	7%O ₂		
Particulate Matter	mg/Ncu.m	2.16	2.32	60.0	US. EPA Method 5

Phatchara Samanchan

(Miss Phatchara Samanchan)

Analyst

REG.NO.7-239-9-0021

Narisa Poowasanpetch

(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. ^{1/} At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. ^{2/} Notification of the Ministry of Natural Resources and Environment B.E.2554.

**The Monitoring Result of Emission Concentration
GAS Turbine 3
PTT Global Chemical Public Company Limited
May 14, 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	7.89	7.93	44.63	44.64	47.84
2	7.94	7.98	44.03	44.04	47.38
3	7.88	7.92	43.47	43.47	46.55
Average	7.91	7.94	44.04	44.05	47.26

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	7.89	7.93	0.56	0.50	0.54
2	7.94	7.98	0.58	0.52	0.56
3	7.88	7.92	0.57	0.51	0.55
Average	7.91	7.94	0.57	0.51	0.55

Run Number	Oxygen content (%)		Carbonmonoxide (ppm)		
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2	Corrected Gas Conc @7% O2
1	7.89	7.93	0.22	0.19	0.20
2	7.94	7.98	0.21	0.18	0.19
3	7.88	7.92	0.16	0.12	0.13
Average	7.91	7.94	0.20	0.16	0.18

**PTT Global Chemical Public Company Limited
EMISSION TEST RESULT**

Date: May 14, 2024
 Start time: 11:10 AM
 O₂ instrument Model: AMI 70
 NO_x instrument Model: API 200 AH
 SO₂ instrument Model: API 100 AH
 CO instrument Model: THERMO 48 C
 Fuel Type : Natural Gas

Run # : 1
 Location : GAS Turbine 3
 Finish time : 11:30 AM
 Serial No.: 071023-47
 Serial No.: 441
 Serial No.: 060
 Serial No.: 388
 Test Operator : Kittipong T.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)
11:10 AM	8.09	44.14	0.57	0.25
11:11 AM	8.06	43.95	0.55	0.30
11:12 AM	8.03	44.00	0.54	0.26
11:13 AM	8.05	44.39	0.56	0.27
11:14 AM	8.01	44.55	0.56	0.21
11:15 AM	8.02	44.43	0.59	0.21
11:16 AM	7.96	44.26	0.54	0.21
11:17 AM	7.86	44.33	0.55	0.21
11:18 AM	7.83	44.77	0.58	0.21
11:19 AM	7.79	44.99	0.57	0.21
11:20 AM	7.77	44.57	0.55	0.21
11:21 AM	7.77	44.79	0.58	0.21
11:22 AM	7.76	44.87	0.57	0.21
11:23 AM	7.71	44.81	0.54	0.21
11:24 AM	7.78	45.00	0.56	0.21
11:25 AM	7.88	44.92	0.58	0.21
11:26 AM	7.83	44.78	0.61	0.21
11:27 AM	7.90	44.83	0.54	0.21
11:28 AM	7.88	44.85	0.54	0.21
11:29 AM	7.87	45.09	0.54	0.21
11:30 AM	7.92	44.93	0.53	0.21
Average	7.89	44.63	0.56	0.22

Signature



(Miss Katesarin Vorradetwittaya)

Environmental Scientist

PTT Global Chemical Public Company Limited
EMISSION TEST RESULT

Date: May 14, 2024	Run # : 2
Start time: 11:31 AM	Location : GAS Turbine 3
O₂ instrument Model: AMI 70	Finish time : 11:51 AM
NO_x instrument Model: API 200 AH	Serial No.: 071023-47
SO₂ instrument Model: API 100 AH	Serial No.: 441
CO instrument Model: THERMO 48 C	Serial No.: 060
Fuel Type : Natural Gas	Serial No.: 388
	Test Operator : Kittipong T.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)
11:31 AM	7.97	44.60	0.51	0.21
11:32 AM	7.94	44.37	0.52	0.21
11:33 AM	7.91	44.51	0.52	0.21
11:34 AM	7.92	44.38	0.54	0.21
11:35 AM	7.96	44.22	0.55	0.21
11:36 AM	7.95	44.45	0.54	0.21
11:37 AM	7.99	44.34	0.58	0.21
11:38 AM	7.98	44.11	0.57	0.21
11:39 AM	7.99	43.89	0.59	0.21
11:40 AM	7.97	43.90	0.61	0.21
11:41 AM	7.92	43.76	0.59	0.21
11:42 AM	7.87	43.87	0.59	0.21
11:43 AM	7.93	44.03	0.62	0.21
11:44 AM	7.98	44.05	0.61	0.21
11:45 AM	7.98	43.86	0.63	0.19
11:46 AM	7.94	43.70	0.58	0.19
11:47 AM	7.90	43.41	0.61	0.21
11:48 AM	7.91	43.52	0.64	0.21
11:49 AM	7.90	43.78	0.59	0.21
11:50 AM	7.90	43.90	0.61	0.21
11:51 AM	7.95	44.05	0.59	0.21
Average	7.94	44.03	0.58	0.21

Signature



(Miss Katesarin Vorradetwittaya)

Environmental Scientist

PTT Global Chemical Public Company Limited
EMISSION TEST RESULT

Date: May 14, 2024	Run # : 3
Start time: 11:52 AM	Location : GAS Turbine 3
O₂ instrument Model: AMI 70	Finish time : 12:12 PM
NO_x instrument Model: API 200 AH	Serial No.: 071023-47
SO₂ instrument Model: API 100 AH	Serial No.: 441
CO instrument Model: THERMO 48 C	Serial No.: 060
Fuel Type : Natural Gas	Serial No.: 388
	Test Operator : Kittipong T.

Time, min	O ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)
11:52 AM	7.97	44.11	0.55	0.21
11:53 AM	7.97	43.76	0.55	0.21
11:54 AM	7.88	43.37	0.62	0.21
11:55 AM	7.87	43.34	0.51	0.21
11:56 AM	7.86	43.59	0.53	0.21
11:57 AM	7.91	43.89	0.52	0.21
11:58 AM	7.97	43.92	0.57	0.17
11:59 AM	7.89	43.69	0.59	0.12
12:00 PM	7.83	43.39	0.60	0.19
12:01 PM	7.81	43.41	0.59	0.16
12:02 PM	7.87	43.51	0.61	0.11
12:03 PM	7.97	43.51	0.62	0.12
12:04 PM	7.91	43.36	0.60	0.19
12:05 PM	7.89	43.18	0.55	0.19
12:06 PM	7.82	42.97	0.65	0.11
12:07 PM	7.85	43.18	0.56	0.11
12:08 PM	7.90	43.46	0.58	0.11
12:09 PM	7.89	43.56	0.60	0.11
12:10 PM	7.84	43.39	0.55	0.11
12:11 PM	7.80	43.07	0.53	0.11
12:12 PM	7.82	43.18	0.55	0.11
Average	7.88	43.47	0.57	0.16

Signature



(Miss Katesarin Vorradetwittaya)

Environmental Scientist



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. : PTTGC6 (Refinery)_224010_Cert-Stk/Scrubber
Branch 6 (Refinery) SAMPLING DATE : 15/05/2024
SAMPLING BY : SECOT Co., Ltd. ANALYTICAL DATE : 21/05/2024
RECEIVED DATE : 16/05/2024 SAMPLE CONDITION : Normal
REPORT DATE : 27/05/2024 OPERATOR : Mr. Song Hanghchwankun
STACK LOCATION : Inlet Sulfur Scrubber SOURCE DESCRIPTION : Process

STACK DESCRIPTION

Height : 5.0 m Gas Velocity : 2.8 m/s
Diameter : 0.5 m Flow rate^{1/} : 24.3 Neu.m/min
Temperature : 90.0 °C Excess Oxygen : 20.8 %

PARAMETER	UNIT	ND	RESULTS	STANDARD	REFERENCE METHOD
		Non-detectable	Inlet		
Hydrogen Sulfide (H ₂ S)	ppm	<0.30	ND	-	US. EPA Method 16

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

Narisa Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

The Monitoring Result of Emission Concentration Sulfur scrubber (Inlet) PTT Global Chemical Public Company Limited May 15, 2024

Run Number	Oxygen content (%)		Sulfur dioxide (ppm)	
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2
1	20.79	20.79	17.01	17.00
2	20.78	20.78	17.52	17.51
3	20.78	20.78	17.70	17.69
Average	20.78	20.78	17.41	17.40

PTT Global Chemical Public Company Limited
EMISSION TEST RESULT

Date: May 15, 2024

Start time: 3:00 PM

O₂ instrument Model: AMI 70SO₂ instrument Model: API 100 AH

Fuel Type: -

Run #: 1

Location: Sulfur scrubber (Inlet)

Finish time: 3:20 PM

Serial No.: 071023-47

Serial No.: 060

Test Operator: Kittipong T.

Time, min	O ₂ (%)	SO ₂ (ppm)
3:00 PM	20.78	15.40
3:01 PM	20.78	15.90
3:02 PM	20.77	16.44
3:03 PM	20.78	16.59
3:04 PM	20.78	16.86
3:05 PM	20.78	16.85
3:06 PM	20.78	17.02
3:07 PM	20.79	16.90
3:08 PM	20.79	17.15
3:09 PM	20.79	17.21
3:10 PM	20.79	17.18
3:11 PM	20.79	17.37
3:12 PM	20.79	17.34
3:13 PM	20.79	17.30
3:14 PM	20.79	17.26
3:15 PM	20.79	17.40
3:16 PM	20.79	17.49
3:17 PM	20.79	17.39
3:18 PM	20.79	17.34
3:19 PM	20.79	17.46
3:20 PM	20.79	17.32
Average	20.79	17.01

Signature

(Miss Katesarin Vorradetwittaya)

Environmental Scientist

PTT Global Chemical Public Company Limited
EMISSION TEST RESULT

Date: May 15, 2024

Start time: 3:21 PM

O₂ instrument Model: AMI 70SO₂ instrument Model: API 100 AH

Fuel Type: -

Run #: 2

Location: Sulfur scrubber (Inlet)

Finish time: 3:41 PM

Serial No.: 071023-47

Serial No.: 060

Test Operator: Kittipong T.

Time, min	O ₂ (%)	SO ₂ (ppm)
3:21 PM	20.78	17.26
3:22 PM	20.79	17.27
3:23 PM	20.78	17.36
3:24 PM	20.79	17.45
3:25 PM	20.78	17.41
3:26 PM	20.78	17.34
3:27 PM	20.78	17.47
3:28 PM	20.78	17.46
3:29 PM	20.78	17.50
3:30 PM	20.78	17.47
3:31 PM	20.78	17.64
3:32 PM	20.78	17.78
3:33 PM	20.78	17.63
3:34 PM	20.78	17.67
3:35 PM	20.79	17.60
3:36 PM	20.78	17.61
3:37 PM	20.78	17.66
3:38 PM	20.78	17.72
3:39 PM	20.78	17.53
3:40 PM	20.78	17.62
3:41 PM	20.78	17.49
Average	20.78	17.52

Signature

(Miss Katesarin Vorradetwittaya)

Environmental Scientist

PTT Global Chemical Public Company Limited

EMISSION TEST RESULT

Date: May 15, 2024
Start time: 3:42 PM
O₂ instrument Model: AMI 70
SO₂ instrument Model: API 100 AH
Fuel Type : -

Run # : 3
Location : Sulfur scrubber (Inlet)
Finish time : 4:02 PM
Serial No.: 071023-47
Serial No.: 060
Test Operator : Kittipong T.

Time, min	O ₂ (%)	SO ₂ (ppm)
3:42 PM	20.79	17.57
3:43 PM	20.78	17.56
3:44 PM	20.78	17.66
3:45 PM	20.78	17.71
3:46 PM	20.78	17.62
3:47 PM	20.78	17.64
3:48 PM	20.78	17.68
3:49 PM	20.78	17.80
3:50 PM	20.78	17.58
3:51 PM	20.78	17.73
3:52 PM	20.78	17.74
3:53 PM	20.78	17.76
3:54 PM	20.78	17.77
3:55 PM	20.78	17.58
3:56 PM	20.78	17.78
3:57 PM	20.78	17.69
3:58 PM	20.78	17.79
3:59 PM	20.78	17.92
4:00 PM	20.78	17.72
4:01 PM	20.78	17.64
4:02 PM	20.78	17.66
Average	20.78	17.70

Signature

(Miss Katesarin Vorradetwittaya)

Environmental Scientist



บริษัท ซีคอต จำกัด

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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.** : PTTGC6 (Refinery)_224010_Cert-Stk/Scrubber
Branch 6 (Refinery) **SAMPLING DATE** : 15/05/2024
SAMPLING BY : SECOT Co., Ltd. **ANALYTICAL DATE** : 21/05/2024
RECEIVED DATE : 16/05/2024 **SAMPLE CONDITION** : Normal
REPORT DATE : 27/05/2024 **OPERATOR** : Mr. Song Hangchwankun
STACK LOCATION : Out Sulfur Scrubber **SOURCE DESCRIPTION** : Process

STACK DESCRIPTION

Height : 5.0 m **Gas Velocity** : 2.5 m/s
Diameter : 0.5 m **Flow rate**^{1/} : 26.9 Ncu.m/min
Temperature : 40.0 °C **Excess Oxygen** : 20.7 %

PARAMETER	UNIT	ND	RESULTS	STANDARD ^{2/}	REFERENCE METHOD
		Non-detecable	Outlet		
Hydrogen Sulfide (H ₂ S)	ppm	<0.30	ND	60	US. EPA Method 16

Sudapom S.

(Miss Sudapom Soonthorn)

Analyst

Narisara Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

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

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

3. ^{1/} At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.

4. ^{2/} Notification of the Ministry of Natural Resources and Environment B.E.2554.

**The Monitoring Result of Emission Concentration
Sulfur scrubber (Outlet)
PTT Global Chemical Public Company Limited
May 15, 2024**

Run Number	Oxygen content (%)		Sulfur dioxide (ppm)	
	RM Stack Gas Conc	Corrected Gas Conc	RM Stack Gas Conc	Corrected Gas Conc @Actual O2
1	20.64	20.70	0.26	0.22
2	20.61	20.68	0.25	0.21
3	20.60	20.68	0.24	0.20
Average	20.62	20.69	0.25	0.21

**PTT Global Chemical Public Company Limited
EMISSION TEST RESULT**

Date: May 15, 2024
Start time: 3:00 PM
O₂ instrument Model: AMI 70
SO₂ instrument Model: API 100 AH
Fuel Type : -

Run # : 1
Location : Sulfur scrubber (Outlet)
Finish time : 3:20 PM
Serial No.: 111117-2
Serial No.: 118
Test Operator : Kittipong T.

Time, min	O ₂ (%)	SO ₂ (ppm)
3:00 PM	20.65	0.27
3:01 PM	20.68	0.27
3:02 PM	20.67	0.27
3:03 PM	20.67	0.26
3:04 PM	20.67	0.26
3:05 PM	20.67	0.26
3:06 PM	20.62	0.26
3:07 PM	20.66	0.26
3:08 PM	20.65	0.26
3:09 PM	20.63	0.26
3:10 PM	20.63	0.26
3:11 PM	20.63	0.26
3:12 PM	20.63	0.26
3:13 PM	20.63	0.26
3:14 PM	20.63	0.26
3:15 PM	20.62	0.26
3:16 PM	20.62	0.26
3:17 PM	20.62	0.26
3:18 PM	20.62	0.26
3:19 PM	20.62	0.25
3:20 PM	20.62	0.25
Average	20.64	0.26

Signature

(Miss Katesarin Vorradetwittaya)


Environmental Scientist

PTT Global Chemical Public Company Limited
EMISSION TEST RESULT

Date: May 15, 2024
Start time: 3:21 PM
O₂ instrument Model: AMI 70
SO₂ instrument Model: API 100 AH
Fuel Type : -

Run # : 2
Location : Sulfur scrubber (Outlet)
Finish time : 3:41 PM
Serial No.: 111117-2
Serial No.: 118
Test Operator : Kittipong T.

Time, min	O ₂ (%)	SO ₂ (ppm)
3:21 PM	20.61	0.25
3:22 PM	20.62	0.25
3:23 PM	20.61	0.25
3:24 PM	20.62	0.25
3:25 PM	20.61	0.25
3:26 PM	20.61	0.25
3:27 PM	20.61	0.25
3:28 PM	20.61	0.25
3:29 PM	20.61	0.25
3:30 PM	20.61	0.25
3:31 PM	20.61	0.25
3:32 PM	20.61	0.25
3:33 PM	20.61	0.25
3:34 PM	20.60	0.25
3:35 PM	20.61	0.25
3:36 PM	20.61	0.25
3:37 PM	20.61	0.25
3:38 PM	20.61	0.25
3:39 PM	20.61	0.25
3:40 PM	20.61	0.25
3:41 PM	20.61	0.25
Average	20.61	0.25


Signature 
 (Miss Katesarin Vorradetwittaya)
 Environmental Scientist

PTT Global Chemical Public Company Limited
EMISSION TEST RESULT

Date: May 15, 2024
Start time: 3:42 PM
O₂ instrument Model: AMI 70
SO₂ instrument Model: API 100 AH
Fuel Type : -

Run # : 3
Location : Sulfur scrubber (Outlet)
Finish time : 4:02 PM
Serial No.: 111117-2
Serial No.: 118
Test Operator : Kittipong T.

Time, min	O ₂ (%)	SO ₂ (ppm)
3:42 PM	20.62	0.25
3:43 PM	20.61	0.25
3:44 PM	20.61	0.25
3:45 PM	20.61	0.25
3:46 PM	20.61	0.25
3:47 PM	20.60	0.25
3:48 PM	20.60	0.25
3:49 PM	20.60	0.25
3:50 PM	20.60	0.25
3:51 PM	20.60	0.24
3:52 PM	20.60	0.24
3:53 PM	20.60	0.24
3:54 PM	20.60	0.24
3:55 PM	20.60	0.24
3:56 PM	20.60	0.24
3:57 PM	20.60	0.24
3:58 PM	20.62	0.24
3:59 PM	20.60	0.24
4:00 PM	20.60	0.24
4:01 PM	20.60	0.24
4:02 PM	20.60	0.24
Average	20.60	0.24

Signature 
 (Miss Katesarin Vorradetwittaya)
 Environmental Scientist



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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. : PTTGC6 (Refinery)_224010_Cert-Stk/VRU RTF
Branch 6 (Refinery) SAMPLING DATE : 15/05/2024
SAMPLING BY : SECOT Co., Ltd. ANALYTICAL DATE : 18/05/2024
RECEIVED DATE : 16/05/2024 SAMPLE CONDITION : Normal
REPORT DATE : 27/05/2024 OPERATOR : Mr. Song Hanghchwankun
STACK LOCATION : VRU Stack of Tank Farm SOURCE DESCRIPTION : Process

PARAMETER	UNIT	ND	RESULT*			STANDARD	REFERENCE METHOD
		Non-detectable	Inlet (V5202)	Outlet (V5204)	Outlet (V5205)		
TVOC as propane	ppm	-	133,317	2,021	1,828	-	US. EPA Method
	mg/l	-	240	3.65	3.30	-	25A

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

Naim Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

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



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STACK EMISSION ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical Public Co., Ltd. REF. NO. : PTTGC6 (Refinery)_224010_Cert-Stk/VRU RTF
Branch 6 (Refinery) SAMPLING DATE : 15/05/2024
SAMPLING BY : SECOT Co., Ltd. ANALYTICAL DATE : 17-18/05/2024
RECEIVED DATE : 16/05/2024 SAMPLE CONDITION : Normal
REPORT DATE : 27/05/2024 OPERATOR : Mr. Song Hanghchwankun
STACK LOCATION : VRU Stack of Tank Farm SOURCE DESCRIPTION : Process

PARAMETER	UNIT	ND	RESULT*			STANDARD	REFERENCE METHOD
		Non-detectable	Inlet (V5202)	Outlet (V5204)	Outlet (V5205)		
Benzene	ppm	<0.06	4,476	ND	ND	-	US. EPA Method 18
	mg/l	<0.0002	14.30	ND	ND	-	

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

Naim Poowasanpetch

(Miss Narisa Poowasanpetch)

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Branch 6 (Refinery) SAMPLING DATE : 15/05/2024
SAMPLING BY : SECOT Co., Ltd. ANALYTICAL DATE : 18/05/2024
RECEIVED DATE : 16/05/2024 SAMPLE CONDITION : Normal
REPORT DATE : 27/05/2024 OPERATOR : Mr. Song Hangchewankun
STACK LOCATION : VRU Stack of Truck Loading SOURCE DESCRIPTION : Process

PARAMETER	UNIT	ND	RESULT*		ASSIGN VALUE ^{1/}	STANDARD ^{2/}	REFERENCE METHOD
		Non-detectable	Inlet	Outlet			
TVOC as propane	ppm	-	25,983	92.92	-	-	US. EPA Method
	mg/l	-	46.87	0.17	15.0	17.0	25A

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

Marim Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

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4. ^{1/} The assign value in EIA report.

5. ^{2/} Notification of the Ministry of Natural Resources and Environment B.E.2553.



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CLIENT NAME : PTT Global Chemical Public Co., Ltd. REF. NO. : PTTGC6 (Refinery)_224010_Cert-Stk/VRU RTL
Branch 6 (Refinery) SAMPLING DATE : 15/05/2024
SAMPLING BY : SECOT Co., Ltd. ANALYTICAL DATE : 17-18/05/2024
RECEIVED DATE : 16/05/2024 SAMPLE CONDITION : Normal
REPORT DATE : 27/05/2024 OPERATOR : Mr. Song Hangchewankun
STACK LOCATION : VRU Stack of Truck Loading SOURCE DESCRIPTION : Process

PARAMETER	UNIT	ND	RESULT*		ASSIGN VALUE ^{1/}	STANDARD ^{2/}	REFERENCE METHOD
		Non-detectable	Inlet	Outlet			
Benzene	ppm	-	129	0.18	-	-	US. EPA Method
	mg/l	-	0.41	0.001	0.21	-	18

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

Marim Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

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ระดับเสียง



Noise Monitoring Result : Community Noise

MTR-PTTGC6-Refinery

Location : North of Refinery

Monitor Period : 11-18 May 2024

SLM Model : Cirrus CR162B

Serial No : G302741

Site Operator : Mr. Siwanon Kulawong

Calibrator Model : Cirrus CR:515

Serial No : 97097

Calibration Ref dB(A) : 94.0

Certified Date : 04 Sep 2023

SLM Reading / Adjust dB(A) : 93.0/0.7

Expire Date : 03 Sep 2024

Cal Sheet No.: CR-515-2024-129

Time	Equivalent Sound Pressure Level (dB(A))						
	11-12 May 2024	12-13 May 2024	13-14 May 2024	14-15 May 2024	15-16 May 2024	16-17 May 2024	17-18 May 2024
10:00 - 11:00	68.7	69.1	68.3	67.3	68.0	68.1	68.3
11:00 - 12:00	69.1	68.8	66.5	69.3	68.1	67.9	68.0
12:00 - 13:00	69.0	68.8	66.5	68.5	66.5	67.0	68.5
13:00 - 14:00	69.3	68.8	70.2	65.6	66.0	69.1	68.3
14:00 - 15:00	69.8	69.1	68.5	67.8	68.6	68.9	68.7
15:00 - 16:00	69.4	69.0	69.0	62.6	69.3	69.7	67.7
16:00 - 17:00	69.1	69.0	69.5	66.3	67.2	69.4	66.8
17:00 - 18:00	68.8	69.0	68.7	66.3	67.7	67.7	66.8
18:00 - 19:00	68.1	68.9	69.2	66.8	67.5	68.3	69.5
19:00 - 20:00	68.3	68.9	68.7	68.3	67.8	68.5	68.6
20:00 - 21:00	68.2	69.0	69.5	67.1	66.3	69.0	66.7
21:00 - 22:00	68.0	69.1	69.6	67.6	68.7	68.4	65.9
22:00 - 23:00	67.9	69.2	69.7	67.0	67.7	68.1	66.7
23:00 - 00:00	68.0	69.3	69.0	67.2	68.1	68.1	67.2
00:00 - 01:00	67.9	69.5	69.1	66.5	67.4	69.1	67.5
01:00 - 02:00	67.9	69.4	68.4	66.2	69.1	68.8	67.2
02:00 - 03:00	67.7	69.3	68.1	65.6	67.5	67.0	67.5
03:00 - 04:00	67.7	70.3	68.0	66.8	69.8	67.6	66.2
04:00 - 05:00	67.6	69.3	67.5	67.2	67.9	69.5	66.9
05:00 - 06:00	67.4	69.1	67.9	67.8	67.4	66.8	66.5
06:00 - 07:00	67.5	69.1	67.6	67.3	67.3	68.6	67.0
07:00 - 08:00	66.7	68.9	67.6	67.5	68.3	67.8	67.5
08:00 - 09:00	68.3	68.8	67.4	68.3	68.9	67.7	67.0
09:00 - 10:00	68.8	68.4	67.1	68.5	68.7	66.6	67.2
Leq(24)*	68.4	69.1	68.5	67.2	68.0	68.3	67.5
Ldn	74.3	75.7	74.9	73.4	74.5	74.7	73.5
Lmax **	85.0	84.7	85.2	85.7	86.1	86.5	87.8
Standard-24Hr	70 dB(A)						
Standard-Max	115 dB(A)						

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

** Maximum Sound Pressure Level between 10:00-10:00

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

Preeda S.
(Miss Preeda Somjai)
Technical Management Team



Noise Monitoring Result : Background Noise

MTR-PTTGC6-Refinery

Location : North of Refinery

Monitor Period : 11-18 May 2024

SLM Model : Cirrus CR162B

Serial No : G302741

Site Operator : Mr. Siwanon Kulawong

Calibrator Model : Cirrus CR:515

Serial No : 97097

Calibration Ref dB(A) : 94.0

Certified Date : 04 Sep 2023

SLM Reading / Adjust dB(A) : 93.0/0.7

Expire Date : 03 Sep 2024

Cal Sheet No.: CR-515-2024-129

Time	L90 (dB(A))						
	11-12 May 2024	12-13 May 2024	13-14 May 2024	14-15 May 2024	15-16 May 2024	16-17 May 2024	17-18 May 2024
10:00 - 11:00	67.3	68.4	67.3	66.4	67.2	67.6	67.9
11:00 - 12:00	68.4	68.2	65.5	68.6	67.2	67.6	67.2
12:00 - 13:00	68.3	68.3	65.7	67.5	65.7	66.4	67.9
13:00 - 14:00	68.5	68.4	69.7	66.7	65.4	68.2	67.4
14:00 - 15:00	69.0	68.5	68.0	66.8	68.0	67.9	67.8
15:00 - 16:00	68.7	68.5	68.3	66.6	68.3	69.2	67.2
16:00 - 17:00	68.6	68.5	69.0	65.7	66.2	68.9	66.2
17:00 - 18:00	68.3	68.5	68.2	65.6	66.8	66.8	66.3
18:00 - 19:00	67.7	68.5	68.6	66.1	66.8	67.6	68.8
19:00 - 20:00	67.9	68.5	67.7	67.7	67.0	67.6	68.0
20:00 - 21:00	67.8	68.6	68.7	66.1	66.0	68.1	65.8
21:00 - 22:00	67.7	68.7	68.9	66.7	68.2	67.6	65.4
22:00 - 23:00	67.6	68.8	69.1	66.6	67.1	67.6	66.2
23:00 - 00:00	67.7	68.9	68.2	66.8	67.4	67.4	66.3
00:00 - 01:00	67.7	69.1	68.4	65.6	66.8	68.5	67.0
01:00 - 02:00	67.6	69.0	67.9	65.6	68.2	68.3	66.3
02:00 - 03:00	67.3	68.8	67.3	65.3	66.9	66.1	66.6
03:00 - 04:00	67.4	67.9	67.3	66.0	68.9	66.9	65.2
04:00 - 05:00	67.4	68.5	66.7	66.8	67.0	68.9	66.0
05:00 - 06:00	67.2	68.7	67.3	66.8	67.1	66.0	65.9
06:00 - 07:00	67.1	68.6	66.7	66.8	66.6	68.0	66.3
07:00 - 08:00	66.2	68.5	66.6	67.0	67.9	67.1	66.7
08:00 - 09:00	66.6	68.3	66.9	67.6	68.5	67.4	66.2
09:00 - 10:00	68.3	67.8	66.4	67.7	67.9	66.0	66.4
L90(avg)*	67.8	68.5	67.8	66.7	67.3	67.7	66.8

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

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

Preeda S.
(Miss Preeda Somjai)
Technical Management Team



Noise Monitoring Result : Community Noise

MTR-PTTGC6-Refinery

Location : Takuan-Ao Pradu Community-1				Monitor Period : 11-18 May 2024			
SLM Model : Cirrus CR162B				Serial No : G300833			
Site Operator : Mr. Siwanon Kulawong							
Calibrator Model : Cirrus CR:515				Serial No : 97097			
Calibration Ref dB(A) : 94.0				Certified Date : 04 Sep 2023			
SLM Reading / Adjust dB(A) : 93.2/0.5				Expire Date : 03 Sep 2024			
Cal Sheet No.: CR-515-2024-129							
Time	Equivalent Sound Pressure Level (dB(A))						
	11-12 May 2024	12-13 May 2024	13-14 May 2024	14-15 May 2024	15-16 May 2024	16-17 May 2024	17-18 May 2024
14:00 - 15:00	56.2	55.9	57.1	57.3	56.8	57.4	67.7
15:00 - 16:00	55.4	57.2	63.5	55.0	55.7	53.9	55.7
16:00 - 17:00	55.5	55.5	57.2	55.8	61.1	57.6	53.7
17:00 - 18:00	56.9	55.2	58.7	65.4	56.6	57.5	55.1
18:00 - 19:00	55.7	58.1	56.9	65.1	58.3	59.0	62.1
19:00 - 20:00	55.1	55.0	58.8	57.7	57.0	58.4	59.0
20:00 - 21:00	55.9	53.6	54.7	57.6	56.7	56.0	57.4
21:00 - 22:00	51.8	50.8	52.2	55.1	52.9	54.2	55.5
22:00 - 23:00	51.2	55.6	51.4	52.7	51.5	53.9	61.4
23:00 - 00:00	52.8	50.4	51.6	51.2	47.7	53.6	55.2
00:00 - 01:00	52.3	51.2	49.5	50.1	45.9	49.4	53.3
01:00 - 02:00	48.8	49.9	48.1	51.0	45.7	58.3	47.9
02:00 - 03:00	49.1	49.4	49.4	50.3	47.2	55.8	49.5
03:00 - 04:00	47.9	68.3	53.1	50.3	48.3	50.1	47.8
04:00 - 05:00	47.9	59.1	53.9	52.2	46.0	50.5	45.7
05:00 - 06:00	52.7	56.9	54.3	52.1	47.0	48.9	46.4
06:00 - 07:00	58.1	59.4	56.4	53.6	53.3	50.7	46.9
07:00 - 08:00	55.7	60.0	58.4	57.8	56.2	56.5	51.1
08:00 - 09:00	53.9	59.8	61.6	58.7	58.8	59.6	56.4
09:00 - 10:00	52.4	56.9	60.0	65.5	63.0	65.0	58.0
10:00 - 11:00	52.7	55.3	52.8	60.1	59.8	62.5	55.2
11:00 - 12:00	52.9	55.6	55.6	57.8	54.1	54.0	54.5
12:00 - 13:00	52.8	68.7	55.9	59.7	56.9	56.6	55.3
13:00 - 14:00	54.9	58.5	67.0	69.5	69.2	58.5	58.4
Leq(24)*	54.1	60.0	58.4	60.5	58.8	57.6	58.0
Ldn	59.3	66.7	61.2	62.1	60.1	61.3	61.7
Lmax **	86.3	88.2	83.6	81.9	89.4	92.8	89.1
Standard-24Hr	70 dB(A)						
Standard-Max	115 dB(A)						

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

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

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

Preeda S.
(Miss Preeda Somjai)
Technical Management Team



Noise Monitoring Result : Background Noise

MTR-PTTGC6-Refinery

Location : Takuan-Ao Pradu Community-1				Monitor Period : 11-18 May 2024			
SLM Model : Cirrus CR162B				Serial No : G300833			
Site Operator : Mr. Siwanon Kulawong							
Calibrator Model : Cirrus CR:515				Serial No : 97097			
Calibration Ref dB(A) : 94.0				Certified Date : 04 Sep 2023			
SLM Reading / Adjust dB(A) : 93.2/0.5				Expire Date : 03 Sep 2024			
Cal Sheet No.: CR-515-2024-129							
Time	L90 (dB(A))						
	11-12 May 2024	12-13 May 2024	13-14 May 2024	14-15 May 2024	15-16 May 2024	16-17 May 2024	17-18 May 2024
14:00 - 15:00	45.4	46.4	50.4	47.3	49.3	48.6	46.4
15:00 - 16:00	43.8	46.7	48.2	48.9	48.6	46.7	46.0
16:00 - 17:00	43.7	47.3	46.4	49.1	48.0	48.4	45.2
17:00 - 18:00	44.9	48.2	49.9	50.6	48.0	48.6	46.6
18:00 - 19:00	45.4	48.2	47.2	52.4	48.2	50.4	48.1
19:00 - 20:00	46.4	47.1	46.8	49.1	46.5	48.4	48.8
20:00 - 21:00	44.8	46.9	47.7	46.9	45.1	48.6	48.2
21:00 - 22:00	45.0	46.9	48.3	47.0	43.5	49.2	46.5
22:00 - 23:00	45.7	47.0	45.1	46.8	42.3	46.6	48.2
23:00 - 00:00	46.5	47.6	47.0	46.7	42.2	46.7	45.1
00:00 - 01:00	45.9	47.8	47.0	47.9	42.0	45.8	44.0
01:00 - 02:00	45.9	47.8	46.4	48.5	42.1	43.4	42.6
02:00 - 03:00	44.9	47.1	47.5	48.8	42.4	46.1	42.1
03:00 - 04:00	44.0	46.7	50.0	48.6	42.2	48.2	42.4
04:00 - 05:00	45.1	53.0	52.8	48.2	42.5	48.5	42.1
05:00 - 06:00	45.8	53.1	52.1	48.8	44.5	47.3	41.7
06:00 - 07:00	47.7	54.6	49.0	49.2	44.9	47.2	42.3
07:00 - 08:00	45.0	54.7	50.5	51.3	48.5	48.7	45.0
08:00 - 09:00	42.8	51.9	46.6	50.0	50.5	49.5	48.0
09:00 - 10:00	41.7	50.9	44.9	48.7	47.8	47.0	46.6
10:00 - 11:00	41.6	47.5	43.5	47.0	47.7	43.9	45.3
11:00 - 12:00	41.7	49.0	44.6	46.4	46.8	44.0	45.7
12:00 - 13:00	43.6	48.9	46.3	46.8	45.8	45.6	46.8
13:00 - 14:00	46.2	49.1	45.4	48.3	51.2	46.2	47.4
L90(avg)*	45.0	49.8	48.3	48.8	46.8	47.6	46.0

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

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

Preeda S.
(Miss Preeda Somjai)
Technical Management Team



Noise Monitoring Result : Community Noise

MTR-PTTGC6-Refinery

Location : Takuan-Ao Pradu Community-2

Monitor Period : 11-18 May 2024

SLM Model : Cirrus CR162B

Serial No : G302738

Site Operator : Mr. Siwanon Kulawong

Calibrator Model : Cirrus CR:515

Serial No : 97097

Calibration Ref dB(A) : 94.0

Certified Date : 04 Sep 2023

SLM Reading / Adjust dB(A) : 93.1/0.6

Expire Date : 03 Sep 2024

Cal Sheet No.: CR-515-2024-129

Time	Equivalent Sound Pressure Level (dB(A))						
	11-12 May 2024	12-13 May 2024	13-14 May 2024	14-15 May 2024	15-16 May 2024	16-17 May 2024	17-18 May 2024
14:00 - 15:00	49.2	46.8	51.6	48.9	49.7	55.3	56.0
15:00 - 16:00	51.3	53.3	48.4	53.8	50.6	50.8	52.1
16:00 - 17:00	56.1	49.9	58.7	49.1	51.5	52.4	51.8
17:00 - 18:00	49.3	49.2	51.1	49.1	54.0	49.2	51.6
18:00 - 19:00	52.1	47.8	48.5	51.4	56.5	51.6	50.6
19:00 - 20:00	48.1	43.4	49.3	49.2	50.0	49.5	51.9
20:00 - 21:00	47.7	43.7	47.0	50.2	48.7	49.3	51.5
21:00 - 22:00	47.9	45.0	46.8	47.3	44.4	44.7	53.6
22:00 - 23:00	47.9	44.5	47.1	47.3	44.2	43.4	50.4
23:00 - 00:00	47.5	44.6	47.5	46.6	44.4	44.5	50.9
00:00 - 01:00	48.0	44.9	47.1	46.2	44.1	43.9	50.3
01:00 - 02:00	48.3	44.1	47.5	45.6	43.6	48.3	49.3
02:00 - 03:00	47.5	46.5	47.3	45.4	43.0	61.1	43.8
03:00 - 04:00	47.6	74.1	48.4	45.5	44.0	48.5	47.8
04:00 - 05:00	49.6	63.6	48.4	45.7	45.1	46.1	47.2
05:00 - 06:00	51.5	62.4	47.9	47.4	42.9	45.2	42.8
06:00 - 07:00	50.9	61.4	52.4	47.9	49.1	46.4	46.2
07:00 - 08:00	49.3	61.4	50.4	50.0	50.6	51.6	51.3
08:00 - 09:00	48.1	59.0	51.5	50.5	55.2	53.8	51.6
09:00 - 10:00	48.5	49.1	51.4	54.6	51.8	51.7	52.8
10:00 - 11:00	47.0	49.0	53.9	50.6	51.3	51.3	48.8
11:00 - 12:00	48.9	64.2	53.9	50.8	50.1	52.8	52.6
12:00 - 13:00	46.3	50.4	50.4	50.1	50.9	51.5	50.4
13:00 - 14:00	46.1	50.9	49.7	48.6	54.3	51.3	53.4

Leq(24)*	49.6	61.9	51.1	49.6	50.6	52.0	51.2
Ldn	55.6	71.2	55.7	53.8	53.4	58.8	55.6
Lmax **	73.5	90.1	86.0	77.5	77.1	88.1	80.6

Standard-24Hr	70 dB(A)						
Standard-Max	115 dB(A)						

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

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

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team



Noise Monitoring Result : Background Noise

MTR-PTTGC6-Refinery

Location : Takuan-Ao Pradu Community-2

Monitor Period : 11-18 May 2024

SLM Model : Cirrus CR162B

Serial No : G302738

Site Operator : Mr. Siwanon Kulawong

Calibrator Model : Cirrus CR:515

Serial No : 97097

Calibration Ref dB(A) : 94.0

Certified Date : 04 Sep 2023

SLM Reading / Adjust dB(A) : 93.1/0.6

Expire Date : 03 Sep 2024

Cal Sheet No.: CR-515-2024-129

Time	L90 (dB(A))						
	11-12 May 2024	12-13 May 2024	13-14 May 2024	14-15 May 2024	15-16 May 2024	16-17 May 2024	17-18 May 2024
14:00 - 15:00	46.3	43.7	48.2	46.7	45.5	47.3	48.7
15:00 - 16:00	46.0	46.1	46.8	47.0	46.4	46.7	49.3
16:00 - 17:00	45.8	44.9	46.9	46.5	47.1	49.2	49.1
17:00 - 18:00	45.7	44.6	48.2	46.9	46.9	45.3	48.0
18:00 - 19:00	45.7	43.1	46.3	46.9	45.8	45.1	48.1
19:00 - 20:00	46.1	41.5	45.7	46.4	43.4	43.3	48.6
20:00 - 21:00	46.1	42.0	45.4	46.1	43.5	42.9	48.9
21:00 - 22:00	46.1	43.0	45.1	46.2	43.1	42.9	47.7
22:00 - 23:00	46.1	42.6	45.3	46.2	43.2	42.2	47.2
23:00 - 00:00	45.8	42.2	46.2	45.1	43.7	42.8	48.1
00:00 - 01:00	46.1	42.4	45.9	44.8	43.1	42.5	48.0
01:00 - 02:00	46.0	41.6	46.2	44.6	42.4	42.6	44.1
02:00 - 03:00	45.6	41.7	46.0	44.5	42.2	48.1	41.6
03:00 - 04:00	45.3	48.4	46.4	44.6	42.2	44.5	42.3
04:00 - 05:00	45.4	54.4	46.7	44.6	42.1	43.5	42.8
05:00 - 06:00	45.9	59.6	45.9	44.5	41.8	43.0	40.1
06:00 - 07:00	47.4	58.0	47.2	44.8	41.6	43.5	41.2
07:00 - 08:00	46.5	57.4	48.2	45.6	44.0	45.9	42.0
08:00 - 09:00	45.7	49.7	47.9	45.3	48.1	48.6	47.0
09:00 - 10:00	46.0	45.9	47.2	45.5	45.7	45.7	45.6
10:00 - 11:00	43.2	45.5	47.2	45.6	46.9	47.4	43.2
11:00 - 12:00	42.9	45.8	47.8	45.7	46.8	48.8	45.0
12:00 - 13:00	42.7	47.8	47.9	45.7	47.5	46.7	43.9
13:00 - 14:00	43.3	48.3	47.8	45.8	45.2	44.6	46.6

L90(avg)*	45.6	51.0	46.9	45.7	45.0	45.7	46.5
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Remark : * Average time between 14:00-14:00

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Preeda Somjai)
Technical Management Team

คุณภาพน้ำทิ้ง



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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
TEL. (662) 959-3600 FAX (662) 959-3535 Website: secot.co.th E-mail: envserv@secot.co.th

WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No. :	0061/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 11/01/2024	SAMPLING TIME	: 10:01
RECEIVED DATE	: 12/01/2024	ANALYTICAL DATE	: 12-17/01/2024
REPORT DATE	: 18/01/2024	SITE OPERATOR	: Miss Wiraya Patchimboon
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_WW_January

PARAMETER	UNIT	ANALYSIS	ND	STATION	STANDARD
		METHODS	(non-detectable)	น้ำเสียก่อนผ่านเข้า Neutralization Basin	
Flow Rate ^{1/}	m ³ /hr	-	-	70	-
Temperature	°C	2550 B	< 0.5	32.1	-
pH	-	4500-H ⁺ B	< 0.10	7.09	-
Total Dissolved Solids	mg/l	2540 C	< 50	902	-
Total Suspended Solids	mg/l	2540 D	< 5	324	-
Fat Oil & Grease	mg/l	5520 B	< 0.50	96.4	-
Sulfide as H ₂ S	mg/l	4500-S ²⁻ F	< 0.20	6.8	-
Phenols	mg/l	5530 B,D	< 0.10	3.2	-
BOD ₅	mg/l	5210 B	< 1.0	335	-
COD	mg/l	5220 C	< 15.00	598	-
Ammonia Nitrogen	mg/l	4500-NH ₃ B,C	< 0.02	27.4	-
Arsenic (As)	mg/l	3114 C	< 0.0001	4.41	-
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	-
Lead (Pb)	mg/l	3120 B	< 0.008	ND	-
Mercury (Hg)	mg/l	3112 B	< 0.0005	0.0735	-

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

(Miss Khemchuda Insorn)
Analyst
REG. NO. 2-239-ก-0005

(Mrs. Araya Tipparuk)
Technical Management Team
REG. NO. 2-239-ก-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/} Data from PTT Global Chemical Public Company Limited, Branch 6 (Refinery)

4. - Not available.



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SECOT CO., LTD.

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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
TEL. (662) 959-3600 FAX (662) 959-3535 Website: secot.co.th E-mail: envserv@secot.co.th

WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No. :	0061/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 11/01/2024	SAMPLING TIME	: 10:18
RECEIVED DATE	: 12/01/2024	ANALYTICAL DATE	: 12-17/01/2024
REPORT DATE	: 18/01/2024	SITE OPERATOR	: Miss Wiraya Patchimboon
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_WW_January

PARAMETER	UNIT	ANALYSIS	ND	STATION	STANDARD
		METHODS	(non-detectable)	น้ำเสียก่อนผ่านเข้า CPI	
Flow Rate ^{1/}	m ³ /hr	-	-	70	-
Temperature	°C	2550 B	< 0.5	39.4	-
pH	-	4500-H ⁺ B	< 0.10	7.49	-
Total Dissolved Solids	mg/l	2540 C	< 50	1,050	-
Total Suspended Solids	mg/l	2540 D	< 5	96	-
Fat Oil & Grease	mg/l	5520 B	< 0.50	272	-
Sulfide as H ₂ S	mg/l	4500-S ²⁻ F	< 0.20	11.7	-
Phenols	mg/l	5530 B,D	< 0.10	3.6	-
BOD ₅	mg/l	5210 B	< 1.0	313	-
COD	mg/l	5220 C	< 15.00	520	-
Ammonia Nitrogen	mg/l	4500-NH ₃ B,C	< 0.02	31.3	-
Arsenic (As)	mg/l	3114 C	< 0.0001	1.72	-
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	-
Lead (Pb)	mg/l	3120 B	< 0.008	ND	-
Mercury (Hg)	mg/l	3112 B	< 0.0005	0.0167	-

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

(Miss Khemchuda Insorn)
Analyst
REG. NO. 2-239-ก-0005

(Mrs. Araya Tipparuk)
Technical Management Team
REG. NO. 2-239-ก-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/} Data from PTT Global Chemical Public Company Limited, Branch 6 (Refinery)

4. - Not available.



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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
TEL. (662) 959-3600 FAX (662) 959-3535 Website: secot.co.th E-mail: envserv@secot.co.th

WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0061/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 11/01/2024	SAMPLING TIME	: 10:03
RECEIVED DATE	: 12/01/2024	ANALYTICAL DATE	: 12-17/01/2024
REPORT DATE	: 18/01/2024	SITE OPERATOR	: Miss Wiraya Patchimboon
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_WW_January

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION	STANDARD ^{1/}
				น้ำทิ้งหลังผ่านการบำบัดที่ Observation Basin	
Flow Rate ^{2/}	m ³ /hr	-	-	.90	-
Temperature	°C	2550 B	< 0.5	32.8	≤ 40
pH	-	4500-H ⁺ B	< 0.10	7.54	5.5-9.0
Total Dissolved Solids	mg/l	2540 C	< 50	1,756	< 36,220 ^{3/}
Total Suspended Solids	mg/l	2540 D	< 5	7	≤ 50
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	≤ 5
Sulfide as H ₂ S	mg/l	4500-S ²⁻ F	< 0.20	ND	≤ 1
Phenols	mg/l	5530 B,C	< 0.001	ND	≤ 1
BOD ₅	mg/l	5210 B	< 1.0	2.5	≤ 20
COD	mg/l	5220 C	< 15.00	30.85	≤ 120
Ammonia Nitrogen	mg/l	Method 350.2	< 0.02	0.07	-
Arsenic (As)	mg/l	3114 C	< 0.0001	0.0923	≤ 0.25
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	≤ 0.03
Lead (Pb)	mg/l	3120 B	< 0.008	ND	≤ 0.2
Mercury (Hg)	mg/l	3112 B	< 0.0005	ND	≤ 0.005
Benzene	µg/l	5030 C / 8260 D	< 0.20	ND	-

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

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

Khemchuda Insorn

(Miss Khemchuda Insorn)

Analyst

REG. NO. 2-239-ก-0005

Mrs. Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 2-239-ก-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 Industry, B.E.2560 (2017).

4.^{2/} Data from PTT Global Chemical Public Company Limited, Branch 6 (Refinery)

5.^{3/} 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 January 11, 2024

found to be 31,220 mg/l therefore the Standard of TDS found to be 36,220 mg/l).

6. - Not available.



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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
TEL. (662) 959-3600 FAX (662) 959-3535 Website: secot.co.th E-mail: envserv@secot.co.th

WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0061/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 11/01/2024	SAMPLING TIME	: 09:37
RECEIVED DATE	: 12/01/2024	ANALYTICAL DATE	: 12-17/01/2024
REPORT DATE	: 18/01/2024	SITE OPERATOR	: Miss Wiraya Patchimboon
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_WW_January

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION	STANDARD ^{1/}
				บ่อบำบัด LLOD-S	
Temperature	°C	2550 B	< 0.5	31.5	≤ 40
pH	-	4500-H ⁺ B	< 0.10	7.23	5.5-9.0
Total Dissolved Solids	mg/l	2540 C	< 50	1,706	≤ 36,220
Total Suspended Solids	mg/l	2540 D	< 5	< 5	≤ 50
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	≤ 5
BOD ₅	mg/l	5210 B	< 1.0	1.7	≤ 20
COD	mg/l	5220 C	< 15.00	19.28	≤ 120

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

Khemchuda Insorn

(Miss Khemchuda Insorn)

Analyst

REG. NO. 2-239-ก-0005

Mrs. Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 2-239-ก-0004

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3.^{1/} Notification of the Ministry of Industry, B.E.2560 (2017).

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 January 11, 2024 found to be 31,220 mg/l therefore the Standard of TDS found to be 36,220 mg/l).

4. - Not available.



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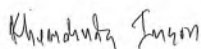
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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
TEL. (662) 959-3600 FAX (662) 959-3535 Website: secot.co.th E-mail: envserv@secot.co.th

WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0182/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 01/02/2024	SAMPLING TIME	: 09:39
RECEIVED DATE	: 02/02/2024	ANALYTICAL DATE	: 02-08/02/2024
REPORT DATE	: 08/02/2024	SITE OPERATOR	: Miss Wiraya Patchimboon
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_WW_February

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION	STANDARD
				น้ำเสียก่อนผ่านเข้า Neutralization Basin	
Flow Rate ^{1/}	m ³ /hr	-	-	70.0	-
Temperature	°C	2550 B	< 0.5	35.8	-
pH	-	4500-H ⁺ B	< 0.10	6.95	-
Total Dissolved Solids	mg/l	2540 C	< 50	762	-
Total Suspended Solids	mg/l	2540 D	< 5	136	-
Fat Oil & Grease	mg/l	5520 B	< 0.50	29.6	-
Sulfide as H ₂ S	mg/l	4500-S ²⁻ F	< 0.20	0.60	-
Phenols	mg/l	5530 B,D	< 0.10	2.2	-
BOD ₅	mg/l	5210 B	< 1.0	303	-
COD	mg/l	5220 C	< 15.00	605	-
Ammonia Nitrogen	mg/l	4500-NH ₃ B,C	< 0.02	71.7	-
Arsenic (As)	mg/l	3114 C	< 0.0001	3.89	-
Cadmium (Cd)	mg/l	3120 B	< 0.001	< 0.01	-
Lead (Pb)	mg/l	3120 B	< 0.008	ND	-
Mercury (Hg)	mg/l	3112 B	< 0.0005	0.0221	-

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



(Miss Khemchuda Insorn)

Analyst

REG. NO. 2-239-ก-0005



(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 2-239-ก-0004

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 3. ^{1/} Data from PTT Global Chemical Public Company Limited , Branch 6 (Refinery)
 4. - Not available.



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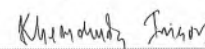
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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0182/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 01/02/2024	SAMPLING TIME	: 10:17
RECEIVED DATE	: 02/02/2024	ANALYTICAL DATE	: 02-08/02/2024
REPORT DATE	: 08/02/2024	SITE OPERATOR	: Miss Wiraya Patchimboon
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_WW_February

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION	STANDARD
				น้ำเสียก่อนผ่านเข้า CPI	
Flow Rate ^{1/}	m ³ /hr	-	-	60.0	-
Temperature	°C	2550 B	< 0.5	41.4	-
pH	-	4500-H ⁺ B	< 0.10	7.62	-
Total Dissolved Solids	mg/l	2540 C	< 50	672	-
Total Suspended Solids	mg/l	2540 D	< 5	14	-
Fat Oil & Grease	mg/l	5520 B	< 0.50	14.1	-
Sulfide as H ₂ S	mg/l	4500-S ²⁻ F	< 0.20	0.66	-
Phenols	mg/l	5530 B,D	< 0.10	1.6	-
BOD ₅	mg/l	5210 B	< 1.0	257	-
COD	mg/l	5220 C	< 15.00	489	-
Ammonia Nitrogen	mg/l	4500-NH ₃ B,C	< 0.02	50.7	-
Arsenic (As)	mg/l	3114 C	< 0.0001	2.93	-
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	-
Lead (Pb)	mg/l	3120 B	< 0.008	ND	-
Mercury (Hg)	mg/l	3112 B	< 0.0005	0.0194	-

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



(Miss Khemchuda Insorn)

Analyst

REG. NO. 2-239-ก-0005



(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 2-239-ก-0004

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 2. This report shall not be reproduced, except in full, without official approval.
 3. ^{1/} Data from PTT Global Chemical Public Company Limited , Branch 6 (Refinery)
 4. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0182/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 01/02/2024	SAMPLING TIME	: 09:50
RECEIVED DATE	: 02/02/2024	ANALYTICAL DATE	: 02-08/02/2024
REPORT DATE	: 08/02/2024	SITE OPERATOR	: Miss Wiraya Patchimboon
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_WW_February

PARAMETER	UNIT	ANALYSIS METHOD	ND (non-detectable)	STATION	STANDARD ^{1/}
				น้ำทิ้งหลังผ่านการบำบัดที่ Observation Basin	
Flow Rate ^{2/}	m ³ /hr	-	-	70.0	-
Temperature	°C	2550 B	< 0.5	31.5	≤ 40
pH	-	4500-H ⁺ B	< 0.10	7.42	5.5-9.0
Total Dissolved Solids	mg/l	2540 C	< 50	1,536	≤ 39,080 ^{2/}
Total Suspended Solids	mg/l	2540 D	< 5	7	≤ 50
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	≤ 5
Sulfide as H ₂ S	mg/l	4500-S ²⁻ F	< 0.20	ND	≤ 1
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	28.50	≤ 120
Ammonia Nitrogen	mg/l	Method 350.2	< 0.02	0.04	-
Arsenic (As)	mg/l	3114 C	< 0.0001	0.0855	≤ 0.25
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	≤ 0.03
Lead (Pb)	mg/l	3120 B	< 0.008	ND	≤ 0.2
Mercury (Hg)	mg/l	3112 B	< 0.0005	ND	≤ 0.005
Benzene	µg/l	5030 C / 8260 D	< 0.20	ND	-

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

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

Khemchuda Insorn

(Miss Khemchuda Insorn)

Analyst

REG. NO. 2-239-n-0005

(Mrs. Araya Tipparuk)

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 2-239-n-0004

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3. ^{1/} Notification of the Ministry of Industry, B.E.2560 (2017).

4. ^{2/} Data from PTT Global Chemical Public Company Limited, Branch 6 (Refinery)

5. ^{3/} 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 February 01, 2024 found to be 34,080 mg/l therefore the Standard of TDS found to be 39,080 mg/l).

6. - 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 PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0182/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 01/02/2024	SAMPLING TIME	: 09:24
RECEIVED DATE	: 02/02/2024	ANALYTICAL DATE	: 02-08/02/2024
REPORT DATE	: 08/02/2024	SITE OPERATOR	: Miss Wiraya Patchimboon
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_WW_February

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION	STANDARD ^{1/}
				บ่อ LLOD-S	
Temperature	°C	2550 B	< 0.5	30.8	≤ 40
pH	-	4500-H ⁺ B	< 0.10	7.48	5.5-9.0
Total Dissolved Solids	mg/l	2540 C	< 50	1,280	≤ 39,080 ^{2/}
Total Suspended Solids	mg/l	2540 D	< 5	< 5	≤ 50
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	≤ 5
BOD ₅	mg/l	5210 B	< 1.0	< 1.0	≤ 20
COD	mg/l	5220 C	< 15.00	24.65	≤ 120

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

Khemchuda Insorn

(Miss Khemchuda Insorn)

Analyst

REG. NO. 2-239-n-0005

(Mrs. Araya Tipparuk)

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 2-239-n-0004

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4. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0437/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 07/03/2024	SAMPLING TIME	: 09:30
RECEIVED DATE	: 08/03/2024	ANALYTICAL DATE	: 08-15/03/2024
REPORT DATE	: 16/03/2024	SITE OPERATOR	: Mr.Chanapon Oakkharaplon
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_WW_March

PARAMETER	UNIT	ANALYSIS	ND	STATION	STANDARD
		METHODS	(non-detectable)	น้ำเสียก่อนผ่านเข้า Neutralization Basin	
Flow Rate ^{1/}	m ³ /hr	-	-	80.0	-
Temperature	°C	2550 B	< 0.5	43.7	-
pH	-	4500-H ⁺ B	< 0.10	6.81	-
Total Dissolved Solids	mg/l	2540 C	< 50	1,308	-
Total Suspended Solids	mg/l	2540 D	< 5	40	-
Fat Oil & Grease	mg/l	5520 B	< 0.50	19.9	-
Sulfide as H ₂ S	mg/l	4500-S ²⁻ F	< 0.20	2.6	-
Phenols	mg/l	5530 B,D	< 0.10	2.3	-
BOD ₅	mg/l	5210 B	< 1.0	152	-
COD	mg/l	5220 C	< 15.00	362	-
Ammonia Nitrogen	mg/l	4500-NH ₃ B,C	< 0.02	33.3	-
Arsenic (As)	mg/l	3114 C	< 0.0001	2.73	-
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	-
Lead (Pb)	mg/l	3120 B	< 0.008	ND	-
Mercury (Hg)	mg/l	3112 B	< 0.0005	0.0162	-

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

Khemchuda Insorn
(Miss Khemchuda Insorn)
Analyst
REG. NO. 2-239-ก-0005

Araya Tipparuk
(Mrs. Araya Tipparuk)
Technical Management Team
REG. NO. 2-239-ก-0004

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4. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0437/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 07/03/2024	SAMPLING TIME	: 09:50
RECEIVED DATE	: 08/03/2024	ANALYTICAL DATE	: 08-15/03/2024
REPORT DATE	: 16/03/2024	SITE OPERATOR	: Mr.Chanapon Oakkharaplon
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_WW_March

PARAMETER	UNIT	ANALYSIS	ND	STATION	STANDARD
		METHODS	(non-detectable)	น้ำเสียก่อนผ่านเข้า CPI	
Flow Rate ^{1/}	m ³ /hr	-	-	60.0	-
Temperature	°C	2550 B	< 0.5	41.2	-
pH	-	4500-H ⁺ B	< 0.10	7.18	-
Total Dissolved Solids	mg/l	2540 C	< 50	418	-
Total Suspended Solids	mg/l	2540 D	< 5	10	-
Fat Oil & Grease	mg/l	5520 B	< 0.50	10.3	-
Sulfide as H ₂ S	mg/l	4500-S ²⁻ F	< 0.20	0.81	-
Phenols	mg/l	5530 B,D	< 0.10	3.4	-
BOD ₅	mg/l	5210 B	< 1.0	155	-
COD	mg/l	5220 C	< 15.00	346	-
Ammonia Nitrogen	mg/l	4500-NH ₃ B,C	< 0.02	29.7	-
Arsenic (As)	mg/l	3114 C	< 0.0001	2.59	-
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	-
Lead (Pb)	mg/l	3120 B	< 0.008	ND	-
Mercury (Hg)	mg/l	3112 B	< 0.0005	0.0047	-

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

Khemchuda Insorn
(Miss Khemchuda Insorn)
Analyst
REG. NO. 2-239-ก-0005

Araya Tipparuk
(Mrs. Araya Tipparuk)
Technical Management Team
REG. NO. 2-239-ก-0004

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4. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0437/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 07/03/2024	SAMPLING TIME	: 09:25
RECEIVED DATE	: 08/03/2024	ANALYTICAL DATE	: 08-15/03/2024
REPORT DATE	: 16/03/2024	SITE OPERATOR	: Mr.Chanapon Oakkharaplon
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_WW_March

PARAMETER	UNIT	ANALYSIS METHOD	ND (non-detectable)	STATION น้ำทิ้งหลังผ่านการบำบัดที่ Observation Basin	STANDARD ^{1/}
Flow Rate ^{2/}	m ³ /hr	-	-	80.0	-
Temperature	°C	2550 B	< 0.5	33.9	≤ 40
pH	-	4500-H ⁺ B	< 0.10	7.43	5.5-9.0
Total Dissolved Solids	mg/l	2540 C	< 50	1,356	≤ 32,980 ^{3/}
Total Suspended Solids	mg/l	2540 D	< 5	5	≤ 50
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	≤ 5
Sulfide as H ₂ S	mg/l	4500-S ²⁻ F	< 0.20	ND	≤ 1
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	52.61	≤ 120
Ammonia Nitrogen	mg/l	Method 350.2	< 0.02	0.05	-
Arsenic (As)	mg/l	3114 C	< 0.0001	0.0838	≤ 0.25
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	≤ 0.03
Lead (Pb)	mg/l	3120 B	< 0.008	ND	≤ 0.2
Mercury (Hg)	mg/l	3112 B	< 0.0005	ND	≤ 0.005
Benzene	µg/l	5030 C / 8260 D	< 0.20	ND	-

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

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

Khemchuda Insorn

(Miss Khemchuda Insorn)

Analyst

REG. NO. 2-239-n-0005

Mrs. Araya Tipparuk

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Technical Management Team

REG. NO. 2-239-n-0004

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3. ^{1/} Notification of the Ministry of Industry, B.E.2560 (2017).

4. ^{2/} Data from PTT Global Chemical Public Company Limited, Branch 6 (Refinery)

5. ^{3/} 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 March 07, 2024

found to be 27,980 mg/l therefore the Standard of TDS found to be 32,980 mg/l).

6. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

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SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 07/03/2024	SAMPLING TIME	: 09:15
RECEIVED DATE	: 08/03/2024	ANALYTICAL DATE	: 08-15/03/2024
REPORT DATE	: 16/03/2024	SITE OPERATOR	: Mr.Chanapon Oakkharaplon
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_WW_March

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION น้ำ LLOD-S	STANDARD ^{1/}
Temperature	°C	2550 B	< 0.5	33.4	≤ 40
pH	-	4500-H ⁺ B	< 0.10	7.66	5.5-9.0
Total Dissolved Solids	mg/l	2540 C	< 50	1,360	≤ 32,980 ^{2/}
Total Suspended Solids	mg/l	2540 D	< 5	< 5	≤ 50
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	≤ 5
BOD ₅	mg/l	5210 B	< 1.0	< 1.0	≤ 20
COD	mg/l	5220 C	< 15.00	19.81	≤ 120

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

Khemchuda Insorn

(Miss Khemchuda Insorn)

Analyst

REG. NO. 2-239-n-0005

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3. ^{1/} Notification of the Ministry of Industry, B.E.2560 (2017).

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 March 07, 2024 found to be 27,980 mg/l therefore the Standard of TDS found to be 32,980 mg/l).

4. - Not available.



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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
TEL. (662) 959-3600 FAX (662) 959-3535 Website: secot.co.th E-mail: envserv@secot.co.th

WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No. :	0663/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 04/04/2024	SAMPLING TIME	: 10:55
RECEIVED DATE	: 05/04/2024	ANALYTICAL DATE	: 05-12/04/2024
REPORT DATE	: 17/04/2024	SITE OPERATOR	: Miss Wiraya Patchimboon
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_WW_April

PARAMETER	UNIT	ANALYSIS	ND	STATION	STANDARD
		METHODS	(non-detectable)	น้ำเสียก่อนผ่านเข้า	
				Neutralization Basin	
Flow Rate ^{1/}	m ³ /hr	-	-	40	-
Temperature	°C	2550 B	< 0.5	38.7	-
pH	-	4500-H ⁺ B	< 0.10	6.61	-
Total Dissolved Solids	mg/l	2540 C	< 50	1,181	-
Total Suspended Solids	mg/l	2540 D	< 5	144	-
Fat Oil & Grease	mg/l	5520 B	< 0.50	11.4	-
Sulfide as H ₂ S	mg/l	4500-S ²⁻ F	< 0.20	1.0	-
Phenols	mg/l	5530 B,D	< 0.10	1.6	-
BOD ₅	mg/l	5210 B	< 1.0	227	-
COD	mg/l	5220 C	< 15.00	695	-
Ammonia Nitrogen	mg/l	4500-NH ₃ B,C	< 0.02	38.9	-
Arsenic (As)	mg/l	3114 C	< 0.0001	4.62	-
Cadmium (Cd)	mg/l	3120 B	< 0.001	< 0.01	-
Lead (Pb)	mg/l	3120 B	< 0.008	ND	-
Mercury (Hg)	mg/l	3112 B	< 0.0005	0.0164	-

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

Khemchuda Insorn
(Miss Khemchuda Insorn)

Analyst

REG. NO. 2-239-ก-0005

Araya Tipparuk
(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 2-239-ก-0004

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3. ^{1/} Data from PTT Global Chemical Public Company Limited, Branch 6 (Refinery)
4. - 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 PCL, Branch 6 (Refinery)	REQUEST SERVICE No. :	0663/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 04/04/2024	SAMPLING TIME	: 11:03
RECEIVED DATE	: 05/04/2024	ANALYTICAL DATE	: 05-12/04/2024
REPORT DATE	: 17/04/2024	SITE OPERATOR	: Miss Wiraya Patchimboon
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_WW_April

PARAMETER	UNIT	ANALYSIS	ND	STATION	STANDARD
		METHODS	(non-detectable)	น้ำเสียก่อนผ่านเข้า CPI	
Flow Rate ^{1/}	m ³ /hr	-	-	45	-
Temperature	°C	2550 B	< 0.5	39.8	-
pH	-	4500-H ⁺ B	< 0.10	6.04	-
Total Dissolved Solids	mg/l	2540 C	< 50	572	-
Total Suspended Solids	mg/l	2540 D	< 5	106	-
Fat Oil & Grease	mg/l	5520 B	< 0.50	28.4	-
Sulfide as H ₂ S	mg/l	4500-S ²⁻ F	< 0.20	0.77	-
Phenols	mg/l	5530 B,D	< 0.10	1.4	-
BOD ₅	mg/l	5210 B	< 1.0	262	-
COD	mg/l	5220 C	< 15.00	760	-
Ammonia Nitrogen	mg/l	4500-NH ₃ B,C	< 0.02	31.8	-
Arsenic (As)	mg/l	3114 C	< 0.0001	3.61	-
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	-
Lead (Pb)	mg/l	3120 B	< 0.008	ND	-
Mercury (Hg)	mg/l	3112 B	< 0.0005	0.0223	-

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

Khemchuda Insorn
(Miss Khemchuda Insorn)

Analyst

REG. NO. 2-239-ก-0005

Araya Tipparuk
(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 2-239-ก-0004

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3. ^{1/} Data from PTT Global Chemical Public Company Limited, Branch 6 (Refinery)
4. - Not available.



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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND

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

WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0663/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 04/04/2024	SAMPLING TIME	: 10:34
RECEIVED DATE	: 05/04/2024	ANALYTICAL DATE	: 05-12/04/2024
REPORT DATE	: 17/04/2024	SITE OPERATOR	: Miss Wiraya Patchimboon
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_WW_April

PARAMETER	UNIT	ANALYSIS METHOD	ND (non-detectable)	STATION	STANDARD ^u
				น้ำทิ้งหลังผ่านการบำบัดที่ Observation Basin	
Flow Rate ^{2/}	m ³ /hr	-	-	80	-
Temperature	°C	2550 B	< 0.5	34.2	≤ 40
pH	-	4500-H ⁺ B	< 0.10	7.67	5.5-9.0
Total Dissolved Solids	mg/l	2540 C	< 50	1,176	≤ 33,840 ^{3/}
Total Suspended Solids	mg/l	2540 D	< 5	9	≤ 50
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	≤ 5
Sulfide as H ₂ S	mg/l	4500-S ²⁻ F	< 0.20	ND	≤ 1
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	27.97	≤ 120
Ammonia Nitrogen	mg/l	Method 350.2	< 0.02	0.04	-
Arsenic (As)	mg/l	3114 C	< 0.0001	0.0939	≤ 0.25
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	≤ 0.03
Lead (Pb)	mg/l	3120 B	< 0.008	ND	≤ 0.2
Mercury (Hg)	mg/l	3112 B	< 0.0005	ND	≤ 0.005
Benzene	µg/l	5030 C / 8260 D	< 0.20	ND	-

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

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

Khemchuda Insorn

(Miss Khemchuda Insorn)

Analyst

REG. NO. 7-239-ก-0005

(Mrs. Araya Tipparuk)

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-ก-0004

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

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3. ^u Notification of the Ministry of Industry, B.E.2560 (2017).

4. ^{2/} Data from PTT Global Chemical Public Company Limited, Branch 6 (Refinery)

5. ^{3/} 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 April 04, 2024 found to be 28,840 mg/l therefore the Standard of TDS found to be 33,840 mg/l).

6. - Not available.



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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND

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CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0663/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 04/04/2024	SAMPLING TIME	: 10:22
RECEIVED DATE	: 05/04/2024	ANALYTICAL DATE	: 05-12/04/2024
REPORT DATE	: 17/04/2024	SITE OPERATOR	: Miss Wiraya Patchimboon
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_WW_April

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION	STANDARD ^u
				น้ำ LLOD-S	
Temperature	°C	2550 B	< 0.5	33.5	≤ 40
pH	-	4500-H ⁺ B	< 0.10	7.34	5.5-9.0
Total Dissolved Solids	mg/l	2540 C	< 50	1,429	≤ 33,840 ^{3/}
Total Suspended Solids	mg/l	2540 D	< 5	6	≤ 50
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	≤ 5
BOD ₅	mg/l	5210 B	< 1.0	1.7	≤ 20
COD	mg/l	5220 C	< 15.00	39.74	≤ 120

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

Khemchuda Insorn

(Miss Khemchuda Insorn)

Analyst

REG. NO. 7-239-ก-0005

(Mrs. Araya Tipparuk)

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-ก-0004

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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 April 04, 2024 found to be 28,840 mg/l therefore the Standard of TDS found to be 33,840 mg/l).

4. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No. :	0844/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 02/05/2024	SAMPLING TIME	: 12:03
RECEIVED DATE	: 03/05/2024	ANALYTICAL DATE	: 03-10/05/2024
REPORT DATE	: 13/05/2024	SITE OPERATOR	: Mr. Jeerawat Khotamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_WW_May

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD
				น้ำเสียก่อนผ่านเข้า		
				Neutralization Basin		
Flow Rate ^{1/}	m ³ /hr	-	-	40	-	-
Temperature	°C	2550 B	< 0.5	48.1	-	-
pH	-	4500-H ⁺ B	< 0.10	7.09	-	-
Total Dissolved Solids	mg/l	2540 C	< 50	836	-	-
Total Suspended Solids	mg/l	2540 D	< 5	107	-	-
Fat Oil & Grease	mg/l	5520 B	< 0.50	46.3	-	-
Sulfide as H ₂ S	mg/l	4500-S ²⁻ F	< 0.20	2.0	-	-
Phenols	mg/l	5530 B,D	< 0.10	1.4	-	-
BOD ₅	mg/l	5210 B	< 1.0	272	-	-
COD	mg/l	5220 C	< 15.00	450	-	-
Ammonia Nitrogen	mg/l	4500-NH ₃ B,C	< 0.02	29.5	-	-
Arsenic (As)	mg/l	3114 C	< 0.0001	5.12	-	-
Cadmium (Cd)	mg/l	3120 B	< 0.001	< 0.01	-	-
Lead (Pb)	mg/l	3120 B	< 0.008	ND	-	-
Mercury (Hg)	mg/l	3112 B	< 0.0005	0.0285	-	-

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

Khemchuda Insorn

(Miss Khemchuda Insorn)

Analyst

REG. NO. 2-239-ก-0005

Mrs. Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 2-239-ก-0004

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3. ^{1/} Data from PTT Global Chemical Public Company Limited , Branch 6 (Refinery)

4. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No. :	0844/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 02/05/2024	SAMPLING TIME	: 12:24
RECEIVED DATE	: 03/05/2024	ANALYTICAL DATE	: 03-10/05/2024
REPORT DATE	: 13/05/2024	SITE OPERATOR	: Mr. Jeerawat Khotamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_WW_May

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD
				น้ำเสียก่อนผ่านเข้า	CPI	
Flow Rate ^{1/}	m ³ /hr	-	-	45	-	-
Temperature	°C	2550 B	< 0.5	52.5	-	-
pH	-	4500-H ⁺ B	< 0.10	6.83	-	-
Total Dissolved Solids	mg/l	2540 C	< 50	644	-	-
Total Suspended Solids	mg/l	2540 D	< 5	< 5	-	-
Fat Oil & Grease	mg/l	5520 B	< 0.50	28.6	-	-
Sulfide as H ₂ S	mg/l	4500-S ²⁻ F	< 0.20	0.22	-	-
Phenols	mg/l	5530 B,D	< 0.10	1.5	-	-
BOD ₅	mg/l	5210 B	< 1.0	230	-	-
COD	mg/l	5220 C	< 15.00	348	-	-
Ammonia Nitrogen	mg/l	4500-NH ₃ B,C	< 0.02	37.9	-	-
Arsenic (As)	mg/l	3114 C	< 0.0001	6.09	-	-
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	-	-
Lead (Pb)	mg/l	3120 B	< 0.008	ND	-	-
Mercury (Hg)	mg/l	3112 B	< 0.0005	0.0076	-	-

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

Khemchuda Insorn

(Miss Khemchuda Insorn)

Analyst

REG. NO. 2-239-ก-0005

Mrs. Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 2-239-ก-0004

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4. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0844/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 02/05/2024	SAMPLING TIME	: 11:54
RECEIVED DATE	: 03/05/2024	ANALYTICAL DATE	: 03-10/05/2024
REPORT DATE	: 13/05/2024	SITE OPERATOR	: Mr. Jeerawat Khotamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_WW_May

PARAMETER	UNIT	ANALYSIS METHOD	ND (non-detectable)	STATION	STANDARD ^u
				น้ำทิ้งหลังผ่านการบำบัดที่ Observation Basin	
Flow Rate ^{2/}	m ³ /hr	-	-	79	-
Temperature	°C	2550 B	< 0.5	38.7	≤ 40
pH	-	4500-H ⁺ B	< 0.10	7.81	5.5-9.0
Total Dissolved Solids	mg/l	2540 C	< 50	2,088	≤ 38,340 ^{2/}
Total Suspended Solids	mg/l	2540 D	< 5	< 5	≤ 50
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	≤ 5
Sulfide as H ₂ S	mg/l	4500-S ²⁻ F	< 0.20	ND	≤ 1
Phenols	mg/l	5530 B,C	< 0.001	ND	≤ 1
BOD ₅	mg/l	5210 B	< 1.0	2.5	≤ 20
COD	mg/l	5220 C	< 15.00	36.61	≤ 120
Ammonia Nitrogen	mg/l	Method 350.2	< 0.02	0.05	-
Arsenic (As)	mg/l	3114 C	< 0.0001	0.0675	≤ 0.25
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	≤ 0.03
Lead (Pb)	mg/l	3120 B	< 0.008	ND	≤ 0.2
Mercury (Hg)	mg/l	3112 B	< 0.0005	ND	≤ 0.005
Benzene	µg/l	5030 C / 8260 D	< 0.20	ND	-

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

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

Khemchuda Insorn

(Miss Khemchuda Insorn)

Analyst

REG. NO. 2-239-n-0005

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

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3. ^u Notification of the Ministry of Industry, B.E.2560 (2017).

4. ^{2/} Data from PTT Global Chemical Public Company Limited, Branch 6 (Refinery)

5. ^{3/} 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 May 02, 2024 found to be 33,340 mg/l therefore the Standard of TDS found to be 38,340 mg/l).

6. - Not available.



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SECOT CO., LTD.

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0844/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 02/05/2024	SAMPLING TIME	: 11:43
RECEIVED DATE	: 03/05/2024	ANALYTICAL DATE	: 03-10/05/2024
REPORT DATE	: 13/05/2024	SITE OPERATOR	: Mr. Jeerawat Khotamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_WW_May

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION	STANDARD ^u
				น้ำ LLOD-S	
Temperature	°C	2550 B	< 0.5	37.1	≤ 40
pH	-	4500-H ⁺ B	< 0.10	7.71	5.5-9.0
Total Dissolved Solids	mg/l	2540 C	< 50	1,289	≤ 38,340 ^{2/}
Total Suspended Solids	mg/l	2540 D	< 5	< 5	≤ 50
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	≤ 5
BOD ₅	mg/l	5210 B	< 1.0	1.1	≤ 20
COD	mg/l	5220 C	< 15.00	< 15.00	≤ 120

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

Khemchuda Insorn

(Miss Khemchuda Insorn)

Analyst

REG. NO. 2-239-n-0005

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3. ^u Notification of the Ministry of Industry, B.E.2560 (2017).

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 May 02, 2024 found to be 33,340 mg/l therefore the Standard of TDS found to be 38,340 mg/l).

4. - Not available.



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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 1132/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 06/06/2024	SAMPLING TIME	: 09:54
RECEIVED DATE	: 07/06/2024	ANALYTICAL DATE	: 07-14/06/2024
REPORT DATE	: 15/06/2024	SITE OPERATOR	: Miss Mareeyanee Hawae
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_WW_June

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD
				น้ำเสียก่อนผ่านเข้า		
				Neutralization Basin		
Flow Rate ^{1/}	m ³ /hr	-	-	80	-	-
Temperature	°C	2550 B	< 0.5	33.2	-	-
pH	-	4500-H ⁺ B	< 0.10	7.10	-	-
Total Dissolved Solids	mg/l	2540 C	< 50	1,686	-	-
Total Suspended Solids	mg/l	2540 D	< 5	32	-	-
Fat Oil & Grease	mg/l	5520 B	< 0.50	14.3	-	-
Sulfide as H ₂ S	mg/l	4500-S ²⁻ F	< 0.20	3.4	-	-
Phenols	mg/l	5530 B,D	< 0.10	1.4	-	-
BOD ₅	mg/l	5210 B	< 1.0	210	-	-
COD	mg/l	5220 C	< 15.00	335	-	-
Ammonia Nitrogen	mg/l	4500-NH ₃ B,C	< 0.02	31.6	-	-
Arsenic (As)	mg/l	3114 C	< 0.0001	2.49	-	-
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	-	-
Lead (Pb)	mg/l	3120 B	< 0.008	ND	-	-
Mercury (Hg)	mg/l	3112 B	< 0.0005	0.0061	-	-

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

(Miss Khemchuda Insorn)
Analyst
REG. NO. 2-239-ก-0005

(Mrs. Araya Tipparuk)
Technical Management Team
REG. NO. 2-239-ก-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/} Data from PTT Global Chemical Public Company Limited , Branch 6 (Refinery)
 4. - Not available.



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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 1132/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 06/06/2024	SAMPLING TIME	: 10:06
RECEIVED DATE	: 07/06/2024	ANALYTICAL DATE	: 07-14/06/2024
REPORT DATE	: 15/06/2024	SITE OPERATOR	: Miss Mareeyanee Hawae
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_WW_June

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD
				น้ำเสียก่อนผ่านเข้า	CPI	
Flow Rate ^{1/}	m ³ /hr	-	-	39	-	-
Temperature	°C	2550 B	< 0.5	32.5	-	-
pH	-	4500-H ⁺ B	< 0.10	7.06	-	-
Total Dissolved Solids	mg/l	2540 C	< 50	406	-	-
Total Suspended Solids	mg/l	2540 D	< 5	< 5	-	-
Fat Oil & Grease	mg/l	5520 B	< 0.50	27.0	-	-
Sulfide as H ₂ S	mg/l	4500-S ²⁻ F	< 0.20	3.4	-	-
Phenols	mg/l	5530 B,D	< 0.10	0.29	-	-
BOD ₅	mg/l	5210 B	< 1.0	230	-	-
COD	mg/l	5220 C	< 15.00	377	-	-
Ammonia Nitrogen	mg/l	4500-NH ₃ B,C	< 0.02	22.6	-	-
Arsenic (As)	mg/l	3114 C	< 0.0001	2.00	-	-
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	-	-
Lead (Pb)	mg/l	3120 B	< 0.008	ND	-	-
Mercury (Hg)	mg/l	3112 B	< 0.0005	0.0085	-	-

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

(Miss Khemchuda Insorn)
Analyst
REG. NO. 2-239-ก-0005

(Mrs. Araya Tipparuk)
Technical Management Team
REG. NO. 2-239-ก-0004

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 4. - Not available.



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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL., Branch 6 (Refinery)	REQUEST SERVICE No.	: 1132/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 06/06/2024	SAMPLING TIME	: 09:41
RECEIVED DATE	: 07/06/2024	ANALYTICAL DATE	: 07-14/06/2024
REPORT DATE	: 15/06/2024	SITE OPERATOR	: Miss Mareeyanee Hawae
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_WW_June

PARAMETER	UNIT	ANALYSIS METHOD	ND (non-detectable)	STATION	STANDARD ^u
				น้ำทิ้งหลังผ่านการบำบัดที่ Observation Basin	
Flow Rate ^{2v}	m ³ /hr	-	-	60	-
Temperature	°C	2550 B	< 0.5	38.9	≤ 40
pH	-	4500-H ⁺ B	< 0.10	7.75	5.5-9.0
Total Dissolved Solids	mg/l	2540 C	< 50	2,236	≤ 38,340 ^y
Total Suspended Solids	mg/l	2540 D	< 5	5	≤ 50
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	≤ 5
Sulfide as H ₂ S	mg/l	4500-S ²⁻ F	< 0.20	ND	≤ 1
Phenols	mg/l	5530 B,C	< 0.001	ND	≤ 1
BOD ₅	mg/l	5210 B	< 1.0	1.8	≤ 20
COD	mg/l	5220 C	< 15.00	26.74	≤ 120
Ammonia Nitrogen	mg/l	Method 350.2	< 0.02	0.22	-
Arsenic (As)	mg/l	3114 C	< 0.0001	0.0702	≤ 0.25
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	≤ 0.03
Lead (Pb)	mg/l	3120 B	< 0.008	ND	≤ 0.2
Mercury (Hg)	mg/l	3112 B	< 0.0005	ND	≤ 0.005
Benzene	µg/l	5030 C / 8260 D	< 0.20	ND	-

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

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

(Miss Khemchuda Insorn)

Analyst

REG. NO. 2-239-n-0005

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 2-239-n-0004

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

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3. ^u Notification of the Ministry of Industry, B.E.2560 (2017).

4. ^{2v} Data from PTT Global Chemical Public Company Limited, Branch 6 (Refinery)

5. ^{3v} 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 June 06, 2024 found to be 33,200 mg/l therefore the Standard of TDS found to be 38,200 mg/l).

6. - Not available.



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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
TEL. (662) 959-3600 FAX (662) 959-3535 Website: secot.co.th E-mail: envserv@secot.co.th

WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL., Branch 6 (Refinery)	REQUEST SERVICE No.	: 1132/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Grab
SAMPLING DATE	: 06/06/2024	SAMPLING TIME	: 09:31
RECEIVED DATE	: 07/06/2024	ANALYTICAL DATE	: 07-14/06/2024
REPORT DATE	: 15/06/2024	SITE OPERATOR	: Miss Mareeyanee Hawae
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_WW_June

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION	STANDARD ^u
				บ่อ LLOD-S	
Temperature	°C	2550 B	< 0.5	38.4	≤ 40
pH	-	4500-H ⁺ B	< 0.10	7.26	5.5-9.0
Total Dissolved Solids	mg/l	2540 C	< 50	874	≤ 38,200 ^{2v}
Total Suspended Solids	mg/l	2540 D	< 5	< 5	≤ 50
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND	≤ 5
BOD ₅	mg/l	5210 B	< 1.0	< 1.0	≤ 20
COD	mg/l	5220 C	< 15.00	29.80	≤ 120

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

(Miss Khemchuda Insorn)

Analyst

REG. NO. 2-239-n-0005

(Mrs. Araya Tipparuk)

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4. - Not available.

คุณภาพน้ำทะเล



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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND

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

WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical Public Company Limited ,	REQUEST SERVICE No.	: 0062/67
	Branch 6 (Refinery)	SAMPLING METHOD	: Grab
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING TIME	: 11:04
SAMPLING DATE	: 11/01/2024	ANALYTICAL DATE	: 12-17/01/2024
RECEIVED DATE	: 12/01/2024	SITE OPERATOR	: Miss Wiraya Patchimboon
REPORT DATE	: 18/01/2024	FILE CODE	: 224010_CW_January
SAMPLE CONDITION	: Normal		

PARAMETER	UNIT	ANALYSIS METHODS	ND (non detectable)	STATION
				จุดปล่อยน้ำทิ้งที่ผ่านการบำบัด ทางด้านทิศใต้ของโรงกลั่นน้ำมัน
Temperature	°C	2550 B	< 0.5	31.0
pH	-	4500-H ⁺ B	< 0.10	8.13
Total Dissolved Solids	mg/l	2540 C	< 50	31,220
Total Suspended Solids	mg/l	2540 D	< 5	10
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND
Fat Oil & Grease	-	Visual Testing	-	NV
BOD ₅	mg/l	5210 B	< 1.0	2.2
COD	mg/l	5220 C	< 15.00	38.56

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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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.	: 0183/67
	Branch 6 (Refinery)	SAMPLING METHOD	: Grab
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING TIME	: 11:46
SAMPLING DATE	: 01/02/2024	ANALYTICAL DATE	: 02-08/02/2024
RECEIVED DATE	: 02/02/2024	SITE OPERATOR	: Miss Wiraya Patchimboon
REPORT DATE	: 08/02/2024	FILE CODE	: 224010_CW_February
SAMPLE CONDITION	: Normal		

PARAMETER	UNIT	ANALYSIS METHODS	ND (non detectable)	STATION
				จุดปล่อยน้ำทิ้งที่ผ่านการบำบัด ทางด้านทิศใต้ของโรงกลั่นน้ำมัน
Temperature	°C	2550 B	< 0.5	30.3
pH	-	4500-H ⁺ B	< 0.10	7.89
Total Dissolved Solids	mg/l	2540 C	< 50	34,080
Total Suspended Solids	mg/l	2540 D	< 5	26
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND
Fat Oil & Grease	-	Visual Testing	-	NV
BOD ₅	mg/l	5210 B	< 1.0	< 1.0
COD	mg/l	5220 C	< 15.00	36.21

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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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.	: 0438/67
	Branch 6 (Refinery)	SAMPLING METHOD	: Grab
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING TIME	: 10:40
SAMPLING DATE	: 07/03/2024	ANALYTICAL DATE	: 08-15/03/2024
RECEIVED DATE	: 08/03/2024	SITE OPERATOR	: Mr.Chanapon Oakkharaplon
REPORT DATE	: 16/03/2024	FILE CODE	: 224010_CW_March
SAMPLE CONDITION	: Normal		

PARAMETER	UNIT	ANALYSIS METHODS	ND (non detectable)	STATION
				จุดปล่อยน้ำทิ้งที่ผ่านการบำบัด ทางด้านทิศใต้ของโรงกลั่นน้ำมัน
Temperature	°C	2550 B	< 0.5	33.0
pH	-	4500-H ⁺ B	< 0.10	8.17
Total Dissolved Solids	mg/l	2540 C	< 50	27,980
Total Suspended Solids	mg/l	2540 D	< 5	19
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND
Fat Oil & Grease	-	Visual Testing	-	NV
BOD ₅	mg/l	5210 B	< 1.0	2.0
COD	mg/l	5220 C	< 15.00	69.00

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)

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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical Public Company Limited ,	REQUEST SERVICE No.	: 0662/67
	Branch 6 (Refinery)	SAMPLING METHOD	: Grab
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING TIME	: 13:09
SAMPLING DATE	: 04/04/2024	ANALYTICAL DATE	: 05-12/04/2024
RECEIVED DATE	: 05/04/2024	SITE OPERATOR	: Miss Wiraya Patchimboon
REPORT DATE	: 17/04/2024	FILE CODE	: 224010_CW_April
SAMPLE CONDITION	: Normal		

PARAMETER	UNIT	ANALYSIS METHODS	ND (non detectable)	STATION
				จุดปล่อยน้ำทิ้งที่ผ่านการบำบัด ทางด้านทิศใต้ของโรงกลั่นน้ำมัน
Temperature	°C	2550 B	< 0.5	33.1
pH	-	4500-H ⁺ B	< 0.10	7.95
Total Dissolved Solids	mg/l	2540 C	< 50	28,840
Total Suspended Solids	mg/l	2540 D	< 5	18
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND
Fat Oil & Grease	-	Visual Testing	-	NV
BOD ₅	mg/l	5210 B	< 1.0	4.3
COD	mg/l	5220 C	< 15.00	52.73

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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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical Public Company Limited ,	REQUEST SERVICE No.	: 0843/67
	Branch 6 (Refinery)	SAMPLING METHOD	: Grab
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING TIME	: 17:18
SAMPLING DATE	: 02/05/2024	ANALYTICAL DATE	: 03-10/05/2024
RECEIVED DATE	: 03/05/2024	SITE OPERATOR	: Mr. Baworn Deechaiya
REPORT DATE	: 13/05/2024	FILE CODE	: 224010_CW_May
SAMPLE CONDITION	: Normal		

PARAMETER	UNIT	ANALYSIS METHODS	ND (non detectable)	STATION จุดปล่อยน้ำทิ้งที่ผ่านการบำบัด ทางด้านทิศใต้ของโรงกลั่นน้ำมัน
Temperature	°C	2550 B	< 0.5	35.6
pH	-	4500-H ⁺ B	< 0.10	8.48
Total Dissolved Solids	mg/l	2540 C	< 50	33,340
Total Suspended Solids	mg/l	2540 D	< 5	66
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND
Fat Oil & Grease	-	Visual Testing	-	NV
BOD ₅	mg/l	5210 B	< 1.0	3.9
COD	mg/l	5220 C	< 15.00	73.97

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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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical Public Company Limited ,	REQUEST SERVICE No.	: 1131/67
	Branch 6 (Refinery)	SAMPLING METHOD	: Grab
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING TIME	: 11:10
SAMPLING DATE	: 06/06/2024	ANALYTICAL DATE	: 07-14/06/2024
RECEIVED DATE	: 07/06/2024	SITE OPERATOR	: Miss Mareeyanee Hawae
REPORT DATE	: 15/06/2024	FILE CODE	: 224010_CW_June
SAMPLE CONDITION	: Normal		

PARAMETER	UNIT	ANALYSIS METHODS	ND (non detectable)	STATION จุดปล่อยน้ำทิ้งที่ผ่านการบำบัด ทางด้านทิศใต้ของโรงกลั่นน้ำมัน
Temperature	°C	2550 B	< 0.5	33.5
pH	-	4500-H ⁺ B	< 0.10	7.99
Total Dissolved Solids	mg/l	2540 C	< 50	33,200
Total Suspended Solids	mg/l	2540 D	< 5	69
Fat Oil & Grease	mg/l	5520 B	< 0.50	ND
Fat Oil & Grease	-	Visual Testing	-	NV
BOD ₅	mg/l	5210 B	< 1.0	< 1.0
COD	mg/l	5220 C	< 15.00	131

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

Remark :
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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
TEL. (662) 959-3600 FAX (662) 959-3535 Website: secot.co.th E-mail: envserv@secot.co.th

GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0825/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 30/04/2024	SAMPLING TIME	: 11:07-11:23
RECEIVED DATE	: 01/05/2024	ANALYTICAL DATE	: 30/04/2024, 03-07/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apirl

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION MW-01	STANDARD ^u
pH	-	4500-H ⁺ B	< 0.10	6.81	u
Conductivity	µS/cm	2510 B	< 1.0	409	-
Salinity	ppt	2520 B	< 0.01	0.09	-
Arsenic (As)	mg/l	3114 C	< 0.0001	0.0702	≤ 0.1
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	≤ 2.0
Lead (Pb)	mg/l	3120 B	< 0.008	ND	≤ 4.0
Mercury (Hg)	mg/l	3112 B	< 0.0001	ND	≤ 0.7
Nickel (Ni)	mg/l	3120 B	< 0.002	ND	≤ 5.0

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 22nd ED. 2017 (AWWA.APHA.WEF)

Khemchuda Insorn

(Miss Khemchuda Insorn)

Analyst

REG. NO. 2-239-n-0005

(Mrs. Araya Tipparuk)

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 2-239-n-0004

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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0825/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 30/04/2024	SAMPLING TIME	: 11:07-11:23
RECEIVED DATE	: 01/05/2024	ANALYTICAL DATE	: 04-10/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apirl

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION MW-01	STANDARD ^u
Naphthalene	mg/l	6440 C	< 0.00005	ND	≤ 48
Benzene	mg/l	6200 B	< 0.0002	ND	≤ 0.2
Ethylbenzene	mg/l	6200 B	< 0.0002	ND	≤ 2.0
Toluene	mg/l	6200 B	< 0.0002	ND	≤ 5.0
m-Xylene	mg/l	6200 B	< 0.0002	ND	≤ 24
o-Xylene	mg/l	6200 B	< 0.0002	ND	≤ 24
p-Xylene	mg/l	6200 B	< 0.0002	ND	≤ 24
Total Xylenes	mg/l	6200 B	< 0.0006	ND	≤ 24

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 22nd ED. 2017 (AWWA.APHA.WEF)

Jutarat Jaemruen

(Miss Jutarat Jaemruen)

Analyst

REG. NO. 2-239-n-0022

(Mrs. Araya Tipparuk)

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 2-239-n-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0825/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 30/04/2024	SAMPLING TIME	: 11:07-11:23
RECEIVED DATE	: 01/05/2024	ANALYTICAL DATE	: 04-14/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION MW-01	STANDARD ^u
Total Petroleum Hydrocarbons					
- TPH (C ₅ - C ₉)	mg/l	5030 C / 8260 D	< 0.003	ND	≤ 1.4
- Pentane					
- Benzene					
- Toluene					
- m,p-Xylene					
- o-Xylene					
- Ethylbenzene					
- TPH (C ₉ - C ₁₆)	mg/l	3510 C / 8015 D	< 0.025	ND	≤ 1.7
- n-Nonane					
- n-Decane					
- n-Dodecane					
- n-Tetradecane					
- n-Hexadecane					
- TPH (C ₁₆ - C ₃₅)	mg/l	3510 C / 8015 D	< 0.050	ND	≤ 0.1
- n-Octadecane					
- n-Eicosane					
- n-Docosane					
- n-Tetracosane					
- n-Hexacosane					
- n-Octacosane					
- n-Triacontane					
- n-Dotriacontane					
- n-Tetracontane					
- Pentatriacontane					

REFERENCE : US EPA SW 846 TEST METHODS FOR EVALUATING WATER AND SOLID WASTE 1st ED. 2000

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-9-0001

MR

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-9-0004

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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0825/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 30/04/2024	SAMPLING TIME	: 11:07-11:23
RECEIVED DATE	: 01/05/2024	ANALYTICAL DATE	: 02-09/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION MW-01	STANDARD ^u
alpha-BHC	mg/l	6630 B	< 0.000001	ND	≤ 0.01
gamma-BHC	mg/l	6630 B	< 0.000003	ND	≤ 0.04
Heptachlor	mg/l	6630 B	< 0.000003	ND	≤ 0.01
Aldrin	mg/l	6630 B	< 0.000001	ND	≤ 0.003
beta-BHC	mg/l	6630 B	< 0.000001	ND	≤ 0.03
delta-BHC	mg/l	6630 B	< 0.000003	ND	-
Heptachlor epoxide	mg/l	6630 B	< 0.000001	ND	≤ 0.01
o,p'-DDE	mg/l	6630 B	< 0.000003	ND	≤ 0.1
Endosulfan I	mg/l	6630 B	< 0.000003	ND	≤ 14
gamma-Chlordane	mg/l	6630 B	< 0.000003	ND	≤ 0.04
alpha-Chlordane	mg/l	6630 B	< 0.000003	ND	≤ 0.04
p,p'-DDE	mg/l	6630 B	< 0.000003	ND	≤ 0.1
Dieldrin	mg/l	6630 B	< 0.000003	ND	≤ 0.003
o,p'-DDD	mg/l	6630 B	< 0.000003	ND	≤ 0.2
Endrin	mg/l	6630 B	< 0.000003	ND	≤ 1.0
o,p'-DDT	mg/l	6630 B	< 0.000003	ND	≤ 0.1
p,p'-DDD	mg/l	6630 B	< 0.000003	ND	≤ 0.2
Endosulfan II	mg/l	6630 B	< 0.000003	ND	≤ 14
p,p'-DDT	mg/l	6630 B	< 0.000003	ND	≤ 0.1
Endrin aldehyde	mg/l	6630 B	< 0.000001	ND	-
Endosulfan Sulfate	mg/l	6630 B	< 0.000003	ND	-
Endrin ketone	mg/l	6630 B	< 0.000003	ND	-

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

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-9-0001

MR

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-9-0004

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

GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 1210/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 13/06/2024	SAMPLING TIME	: 10:47-10:59
RECEIVED DATE	: 14/06/2024	ANALYTICAL DATE	: 13, 14-20/06/2024
REPORT DATE	: 25/06/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_June

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION MW-02	STANDARD ^u
pH	-	4500-H ⁺ B	< 0.10	6.38	u
Conductivity	µS/cm	2510 B	< 1.0	424	-
Salinity	ppt	2520 B	< 0.01	0.15	-
Arsenic (As)	mg/l	3114 C	< 0.0001	0.0714	≤ 0.1
Cadmium (Cd)	mg/l	3120 B	< 0.001	< 0.01	≤ 2.0
Lead (Pb)	mg/l	3120 B	< 0.008	ND	≤ 4.0
Mercury (Hg)	mg/l	3112 B	< 0.0001	ND	≤ 0.7
Nickel (Ni)	mg/l	3120 B	< 0.002	< 0.01	≤ 5.0

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

Khemchuda Insorn

(Miss Khemchuda Insorn)

Analyst

REG. NO. 7-239-n-0005

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-n-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 1210/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 13/06/2024	SAMPLING TIME	: 10:47-10:59
RECEIVED DATE	: 14/06/2024	ANALYTICAL DATE	: 14/06/2024
REPORT DATE	: 25/06/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_June

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION MW-02	STANDARD ^u
Naphthalene	mg/l	6440 C	< 0.00005	ND	≤ 48
Benzene	mg/l	6200 B	< 0.0002	ND	≤ 0.2
Ethylbenzene	mg/l	6200 B	< 0.0002	ND	≤ 2.0
Toluene	mg/l	6200 B	< 0.0002	ND	≤ 5.0
m-Xylene	mg/l	6200 B	< 0.0002	ND	≤ 24
o-Xylene	mg/l	6200 B	< 0.0002	ND	≤ 24
p-Xylene	mg/l	6200 B	< 0.0002	ND	≤ 24
Total Xylenes	mg/l	6200 B	< 0.0006	ND	≤ 24

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

Jutarat Jaemruen

(Miss Jutarat Jaemruen)

Analyst

REG. NO. 7-239-n-0022

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-n-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 1210/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 13/06/2024	SAMPLING TIME	: 10:47-10:59
RECEIVED DATE	: 14/06/2024	ANALYTICAL DATE	: 14/06/2024
REPORT DATE	: 25/06/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_June

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION MW-02	STANDARD ^u
Total Petroleum Hydrocarbons					
- TPH (C ₅ - C ₉)	mg/l	5030 C / 8260 D	< 0.003	ND	≤ 1.4
- Pentane					
- Benzene					
- Toluene					
- m,p-Xylene					
- o-Xylene					
- Ethylbenzene					
- TPH (C ₉ - C ₁₆)	mg/l	3510 C / 8015 D	< 0.025	ND	≤ 1.7
- n-Nonane					
- n-Decane					
- n-Dodecane					
- n-Tetradecane					
- n-Hexadecane					
- TPH (C ₁₆ - C ₃₃)	mg/l	3510 C / 8015 D	< 0.050	ND	≤ 0.1
- n-Octadecane					
- n-Eicosane					
- n-Docosane					
- n-Tetracosane					
- n-Hexacosane					
- n-Octacosane					
- n-Triacontane					
- n-Dotriacontane					
- n-Tetracontane					
- Pentatriacontane					

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

Sudaporn S.
(Miss Sudaporn Soonthorn)
Analyst

REG. NO. 2-239-9-0001

(Mrs. Araya Tipparuk)
Technical Management Team
REG. NO. 2-239-9-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 1210/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 13/06/2024	SAMPLING TIME	: 10:47-10:59
RECEIVED DATE	: 14/06/2024	ANALYTICAL DATE	: 20, 24/06/2024
REPORT DATE	: 25/06/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_June

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION MW-02	STANDARD ^u
alpha-BHC	mg/l	6630 B	< 0.000001	ND	≤ 0.01
gamma-BHC	mg/l	6630 B	< 0.000003	ND	≤ 0.04
Heptachlor	mg/l	6630 B	< 0.000003	ND	≤ 0.01
Aldrin	mg/l	6630 B	< 0.000001	ND	≤ 0.003
beta-BHC	mg/l	6630 B	< 0.000001	ND	≤ 0.03
delta-BHC	mg/l	6630 B	< 0.000003	ND	-
Heptachlor epoxide	mg/l	6630 B	< 0.000001	ND	≤ 0.01
o,p'-DDE	mg/l	6630 B	< 0.000003	ND	≤ 0.1
Endosulfan I	mg/l	6630 B	< 0.000003	ND	≤ 14
gamma-Chlordane	mg/l	6630 B	< 0.000003	ND	≤ 0.04
alpha-Chlordane	mg/l	6630 B	< 0.000003	ND	≤ 0.04
p,p'-DDE	mg/l	6630 B	< 0.000003	ND	≤ 0.1
Dieldrin	mg/l	6630 B	< 0.000003	ND	≤ 0.003
o,p'-DDD	mg/l	6630 B	< 0.000003	ND	≤ 0.2
Endrin	mg/l	6630 B	< 0.000003	ND	≤ 1.0
o,p'-DDT	mg/l	6630 B	< 0.000003	ND	≤ 0.1
p,p'-DDD	mg/l	6630 B	< 0.000003	ND	≤ 0.2
Endosulfan II	mg/l	6630 B	< 0.000003	ND	≤ 14
p,p'-DDT	mg/l	6630 B	< 0.000003	ND	≤ 0.1
Endrin aldehyde	mg/l	6630 B	< 0.000001	ND	-
Endosulfan Sulfate	mg/l	6630 B	< 0.000003	ND	-
Endrin ketone	mg/l	6630 B	< 0.000003	ND	-

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

Sudaporn S.
(Miss Sudaporn Soonthorn)
Analyst
REG. NO. 2-239-9-0001

(Mrs. Araya Tipparuk)
Technical Management Team
REG. NO. 2-239-9-0004

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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
TEL. (662) 959-3600 FAX (662) 959-3535 Website : secot.co.th E-mail : envserv@secot.co.th

GROUND WATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical PCL, Branch 6 (Refinery) REQUEST SERVICE No. : 0825/67
SAMPLING BY : SECOT Co., Ltd. SAMPLING METHOD : Pneumatic Bladder Pump
SAMPLING DATE : 29-30/04/2024 SAMPLING TIME : 09:51-10:08, 11:15-11:37
RECEIVED DATE : 01/05/2024 ANALYTICAL DATE : 29-30/04/2024, 03-07/05/2024
REPORT DATE : 15/05/2024 SITE OPERATOR : Mr. Jeerawat Khothamhan
SAMPLE CONDITION : Normal FILE CODE : 224010_GW_Apirl

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^{1/}
				MW-03	MW-04	
pH	-	4500-II B	< 0.10	6.76	7.04	1/
Conductivity	µS/cm	2510 B	< 1.0	816	753	-
Salinity	ppt	2520 B	< 0.01	0.27	0.24	-
Arsenic (As)	mg/l	3114 C	< 0.0001	0.0812	0.0718	≤ 0.1
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	ND	≤ 2.0
Lead (Pb)	mg/l	3120 B	< 0.008	ND	ND	≤ 4.0
Mercury (Hg)	mg/l	3112 B	< 0.0001	ND	ND	≤ 0.7
Nickel (Ni)	mg/l	3120 B	< 0.002	< 0.01	ND	≤ 5.0

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

(Miss Khemchuda Insorn)

Analyst

REG. NO. 7-239-0-0005

(Mrs. Araya Tipparak)

Technical Management Team

REG. NO. 7-239-0-0004

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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
TEL. (662) 959-3600 FAX (662) 959-3535 Website : secot.co.th E-mail : envserv@secot.co.th

GROUND WATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical PCL, Branch 6 (Refinery) REQUEST SERVICE No. : 0825/67
SAMPLING BY : SECOT Co., Ltd. SAMPLING METHOD : Pneumatic Bladder Pump
SAMPLING DATE : 29-30/04/2024 SAMPLING TIME : 09:51-10:08, 11:15-11:37
RECEIVED DATE : 01/05/2024 ANALYTICAL DATE : 04-10/05/2024
REPORT DATE : 15/05/2024 SITE OPERATOR : Mr. Jeerawat Khothamhan
SAMPLE CONDITION : Normal FILE CODE : 224010_GW_Apirl

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^{1/}
				MW-03	MW-04	
Naphthalene	mg/l	6440 C	< 0.00005	ND	ND	≤ 48
Benzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 0.2
Ethylbenzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 2.0
Toluene	mg/l	6200 B	< 0.0002	ND	ND	≤ 5.0
m-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
o-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
p-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
Total Xylenes	mg/l	6200 B	< 0.0006	ND	ND	≤ 24

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

(Miss Jutarat Jaemruen)

Analyst

REG. NO. 7-239-0-0022

(Mrs. Araya Tipparak)

Technical Management Team

REG. NO. 7-239-0-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0825/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 29-30/04/2024	SAMPLING TIME	: 09:51-10:08, 11:15-11:37
RECEIVED DATE	: 01/05/2024	ANALYTICAL DATE	: 04-14/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS	ND	STATION		STANDARD ^{1/}
		METHODS	(non-detectable)	MW-03	MW-04	
Total Petroleum Hydrocarbons						
- TPH (C ₅ - C ₄)	mg/l	5030 C / 8260 D	< 0.003	ND	ND	≤ 1.4
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
- TPH (C ₉ - C ₁₀)	mg/l	3510 C / 8015 D	< 0.025	ND	ND	≤ 1.7
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
- TPH (C ₁₆ - C ₂₂)	mg/l	3510 C / 8015 D	< 0.050	ND	ND	≤ 0.1
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- n-Dotriacontane						
- n-Tetracontane						
- Pentatriacontane						

REFERENCE : US EPA SW 846 TEST METHODS FOR EVALUATING WATER AND SOLID WASTE 1st ED. 2020.

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-9-0001

Araya T.

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-n-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0825/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 29-30/04/2024	SAMPLING TIME	: 09:51-10:08, 11:15-11:37
RECEIVED DATE	: 01/05/2024	ANALYTICAL DATE	: 02-09/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^{1/}
				MW-03	MW-04	
alpha-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
gamma-BHC	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
Heptachlor	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.01
Aldrin	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.003
beta-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.03
delta-BHC	mg/l	6630 B	< 0.000003	ND	ND	-
Heptachlor epoxide	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
o,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endosulfan I	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
gamma-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
alpha-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
p,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Dieldrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.003
o,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 1.0
o,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
p,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endosulfan II	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
p,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endrin aldehyde	mg/l	6630 B	< 0.000001	ND	ND	-
Endosulfan Sulfate	mg/l	6630 B	< 0.000003	ND	ND	-
Endrin ketone	mg/l	6630 B	< 0.000003	ND	ND	-

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

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-9-0001

Araya T.

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-n-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0825/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 29/04/2024	SAMPLING TIME	: 10:43-10:57, 10:07-10:22
RECEIVED DATE	: 01/05/2024	ANALYTICAL DATE	: 29-30/04/2024, 03-07/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khotamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^u
				MW-05	MW-06	
pH	-	4500-H ⁺ B	< 0.10	7.07	6.57	^u
Conductivity	µS/cm	2510 B	< 1.0	984	2,936	-
Salinity	ppt	2520 B	< 0.01	0.34	1.20	-
Arsenic (As)	mg/l	3114 C	< 0.0001	0.0745	0.0367	≤ 0.1
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	ND	≤ 2.0
Lead (Pb)	mg/l	3120 B	< 0.008	ND	ND	≤ 4.0
Mercury (Hg)	mg/l	3112 B	< 0.0001	ND	ND	≤ 0.7
Nickel (Ni)	mg/l	3120 B	< 0.002	ND	< 0.01	≤ 5.0

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

Khemchuda Insom

(Miss Khemchuda Insom)

Analyst

REG. NO. 1-239-ก-0005

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 1-239-ก-0004

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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0825/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 29/04/2024	SAMPLING TIME	: 10:43-10:57, 10:07-10:22
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REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khotamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^u
				MW-05	MW-06	
Naphthalene	mg/l	6440 C	< 0.00005	ND	ND	≤ 48
Benzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 0.2
Ethylbenzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 2.0
Toluene	mg/l	6200 B	< 0.0002	ND	ND	≤ 5.0
m-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
o-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
p-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
Total Xylenes	mg/l	6200 B	< 0.0006	ND	ND	≤ 24

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

Jutarat Jaemruen

(Miss Jutarat Jaemruen)

Analyst

REG. NO. 1-239-ก-0022

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 1-239-ก-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0825/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 29/04/2024	SAMPLING TIME	: 10:43-10:57, 10:07-10:22
RECEIVED DATE	: 01/05/2024	ANALYTICAL DATE	: 04-14/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apir1

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^{1/}
				MW-05	MW-06	
Total Petroleum Hydrocarbons						
- TPH (C ₃ - C ₆)	mg/l	5030 C / 8260 D	< 0.003	ND	ND	≤ 1.4
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
- TPH (C _{>8} - C ₁₆)	mg/l	3510 C / 8015 D	< 0.025	ND	ND	≤ 1.7
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
- TPH (C _{>16} - C ₃₅)	mg/l	3510 C / 8015 D	< 0.050	ND	ND	≤ 0.1
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- n-Dotriacontane						
- n-Tetatriacontane						
- Pentatriacontane						

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

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-0-0001

M

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-0-0004

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REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apir1

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^u
				MW-05	MW-06	
alpha-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
gamma-BHC	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
Heptachlor	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.01
Aldrin	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.003
beta-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.03
delta-BHC	mg/l	6630 B	< 0.000003	ND	ND	-
Heptachlor epoxide	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
o,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endosulfan I	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
gamma-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
alpha-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
p,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Dieldrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.003
o,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 1.0
o,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
p,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endosulfan II	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
p,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endrin aldehyde	mg/l	6630 B	< 0.000001	ND	ND	-
Endosulfan Sulfate	mg/l	6630 B	< 0.000003	ND	ND	-
Endrin ketone	mg/l	6630 B	< 0.000003	ND	ND	-

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

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-0-0001

M

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-0-0004

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SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 29/04/2024	SAMPLING TIME	: 12:00-12:22
RECEIVED DATE	: 01/05/2024	ANALYTICAL DATE	: 29-30/04/2024, 03-07/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION	STANDARD ^U
				MW-07	
pH	-	4500-H B	< 0.10	6.94	U
Conductivity	µS/cm	2510 B	< 1.0	1,638	-
Salinity	ppt	2520 B	< 0.01	0.63	-
Arsenic (As)	mg/l	3114 C	< 0.0001	0.0410	≤ 0.1
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	≤ 2.0
Lead (Pb)	mg/l	3120 B	< 0.008	ND	≤ 4.0
Mercury (Hg)	mg/l	3112 B	< 0.0001	ND	≤ 0.7
Nickel (Ni)	mg/l	3120 B	< 0.002	ND	≤ 5.0

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

Khemchuda Insom

(Miss Khemchuda Insom)

Analyst

REG. NO. 7-239-R-0005

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-R-0004

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SECOT CO., LTD.

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GROUND WATER ANALYSIS REPORT

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SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 29/04/2024	SAMPLING TIME	: 12:00-12:22
RECEIVED DATE	: 01/05/2024	ANALYTICAL DATE	: 04-10/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION	STANDARD ^U
				MW-07	
Naphthalene	mg/l	6440 C	< 0.00005	ND	≤ 48
Benzene	mg/l	6200 B	< 0.0002	ND	≤ 0.2
Ethylbenzene	mg/l	6200 B	< 0.0002	ND	≤ 2.0
Toluene	mg/l	6200 B	< 0.0002	ND	≤ 5.0
m-Xylene	mg/l	6200 B	< 0.0002	ND	≤ 24
o-Xylene	mg/l	6200 B	< 0.0002	ND	≤ 24
p-Xylene	mg/l	6200 B	< 0.0002	ND	≤ 24
Total Xylenes	mg/l	6200 B	< 0.0006	ND	≤ 24

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

Jutarat Jaemruen

(Miss Jutarat Jaemruen)

Analyst

REG. NO. 7-239-R-0022

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-R-0004

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3. ^U Notification of the Ministry of Industry, B.E.2559 (2016).



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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0825/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 29/04/2024	SAMPLING TIME	: 12:00-12:22
RECEIVED DATE	: 01/05/2024	ANALYTICAL DATE	: 04-14/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khotamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION MW-07	STANDARD ^u
Total Petroleum Hydrocarbons					
-TPH (C ₈ - C ₁₆)	mg/l	5030 C / 8260 D	< 0.003	ND	≤ 1.4
- Pentane					
- Benzene					
- Toluene					
- m,p-Xylene					
- o-Xylene					
- Ethylbenzene					
-TPH (C ₈ - C ₁₆)	mg/l	3510 C / 8015 D	< 0.025	ND	≤ 1.7
- n-Nonane					
- n-Decane					
- n-Dodecane					
- n-Tetradecane					
- n-Hexadecane					
-TPH (C ₁₆ - C ₃₅)	mg/l	3510 C / 8015 D	< 0.050	0.067	≤ 0.1
- n-Octadecane					
- n-Eicosane					
- n-Docosane					
- n-Tetracosane					
- n-Hexacosane					
- n-Octacosane					
- n-Triacontane					
- n-Dotriacontane					
- n-Tetracontane					
- Pentatriacontane					

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

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-ก-0001

NT

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-ก-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0825/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 29/04/2024	SAMPLING TIME	: 12:00-12:22
RECEIVED DATE	: 01/05/2024	ANALYTICAL DATE	: 02-09/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khotamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION MW-07	STANDARD ^u
alpha-BHC	mg/l	6630 B	< 0.000001	ND	≤ 0.01
gamma-BHC	mg/l	6630 B	< 0.000003	ND	≤ 0.04
Heptachlor	mg/l	6630 B	< 0.000003	ND	≤ 0.01
Aldrin	mg/l	6630 B	< 0.000001	ND	≤ 0.003
beta-BHC	mg/l	6630 B	< 0.000001	ND	≤ 0.03
delta-BHC	mg/l	6630 B	< 0.000003	ND	-
Heptachlor epoxide	mg/l	6630 B	< 0.000001	ND	≤ 0.01
o,p'-DDE	mg/l	6630 B	< 0.000003	ND	≤ 0.1
Endosulfan I	mg/l	6630 B	< 0.000003	ND	≤ 14
gamma-Chlordane	mg/l	6630 B	< 0.000003	ND	≤ 0.04
alpha-Chlordane	mg/l	6630 B	< 0.000003	ND	≤ 0.04
p,p'-DDE	mg/l	6630 B	< 0.000003	ND	≤ 0.1
Dieldrin	mg/l	6630 B	< 0.000003	ND	≤ 0.003
o,p'-DDD	mg/l	6630 B	< 0.000003	ND	≤ 0.2
Endrin	mg/l	6630 B	< 0.000003	ND	≤ 1.0
o,p'-DDT	mg/l	6630 B	< 0.000003	ND	≤ 0.1
p,p'-DDD	mg/l	6630 B	< 0.000003	ND	≤ 0.2
Endosulfan II	mg/l	6630 B	< 0.000003	ND	≤ 14
p,p'-DDT	mg/l	6630 B	< 0.000003	ND	≤ 0.1
Endrin aldehyde	mg/l	6630 B	< 0.000001	ND	-
Endosulfan Sulfate	mg/l	6630 B	< 0.000003	ND	-
Endrin ketone	mg/l	6630 B	< 0.000003	ND	-

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

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-ก-0001

NT

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-ก-0004

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

GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0810/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 25/04/2024	SAMPLING TIME	: 09:50-10:18, 10:37-10:56
RECEIVED DATE	: 29/04/2024	ANALYTICAL DATE	: 25, 29/04/2024-03/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khotamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^U
				MW-08	MW-10	
pH	-	4500-H ^B	< 0.10	6.96	7.71	U
Conductivity	µS/cm	2510 B	< 1.0	2,247	2,487	-
Salinity	ppt	2520 B	< 0.01	1.1	1.3	-
Arsenic (As)	mg/l	3114 C	< 0.0001	0.0199	0.0012	≤ 0.1
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	ND	≤ 2.0
Lead (Pb)	mg/l	3120 B	< 0.008	ND	ND	≤ 4.0
Mercury (Hg)	mg/l	3112 B	< 0.0001	ND	ND	≤ 0.7
Nickel (Ni)	mg/l	3120 B	< 0.002	ND	ND	≤ 5.0

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

Khemchuda Insorn

(Miss Khemchuda Insorn)

Analyst

REG. NO. 2-239-ก-0005

(Mrs. Araya Tipparuk)

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 2-239-ก-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0810/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 25/04/2024	SAMPLING TIME	: 09:50-10:18, 10:37-10:56
RECEIVED DATE	: 29/04/2024	ANALYTICAL DATE	: 01-10/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khotamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^U
				MW-08	MW-10	
Naphthalene	mg/l	6440 C	< 0.00005	ND	ND	≤ 48
Benzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 0.2
Ethylbenzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 2.0
Toluene	mg/l	6200 B	< 0.0002	ND	ND	≤ 5.0
m-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
o-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
p-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
Total Xylenes	mg/l	6200 B	< 0.0006	ND	ND	≤ 24

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

Jutarat Jaemruen

(Miss Jutarat Jaemruen)

Analyst

REG. NO. 2-239-ก-0022

(Mrs. Araya Tipparuk)

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 2-239-ก-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0810/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 25/04/2024	SAMPLING TIME	: 09:50-10:18, 10:37-10:56
RECEIVED DATE	: 29/04/2024	ANALYTICAL DATE	: 30/04/2024-10/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apirl

PARAMETER	UNIT	ANALYSIS	ND	STATION		STANDARD ^{1/}
		METHODS	(non-detectable)	MW-08	MW-10	
Total Petroleum Hydrocarbons						
- TPH (C ₅ - C ₆)	mg/l	5030 C / 8260 D	< 0.003	ND	ND	≤ 1.4
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
- TPH (C ₈₋₁₆ - C ₁₆)	mg/l	3510 C / 8015 D	< 0.025	ND	ND	≤ 1.7
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
- TPH (C ₁₆₋₃₅ - C ₃₅)	mg/l	3510 C / 8015 D	< 0.050	ND	ND	≤ 0.1
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- n-Dotriacontane						
- n-Tetracontane						
- Pentatriacontane						

REFERENCE : US EPA SW 846 TEST METHODS FOR EVALUATING WATER AND SOLID WASTE 1st ED. 2021

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-0-0001

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-0-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0810/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 25/04/2024	SAMPLING TIME	: 09:50-10:18, 10:37-10:56
RECEIVED DATE	: 29/04/2024	ANALYTICAL DATE	: 01-09/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apirl

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^{1/}
				MW-08	MW-10	
alpha-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
gamma-BHC	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
Heptachlor	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.01
Aldrin	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.003
beta-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.03
delta-BHC	mg/l	6630 B	< 0.000003	ND	ND	-
Heptachlor epoxide	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
o,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endosulfan I	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
gamma-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
alpha-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
p,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Dieldrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.003
o,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 1.0
o,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
p,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endosulfan II	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
p,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endrin aldehyde	mg/l	6630 B	< 0.000001	ND	ND	-
Endosulfan Sulfate	mg/l	6630 B	< 0.000003	ND	ND	-
Endrin ketone	mg/l	6630 B	< 0.000003	ND	ND	-

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

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-0-0001

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-0-0004

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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
TEL. (662) 959-3600 FAX (662) 959-3535 Website : secot.co.th E-mail : envserv@secot.co.th

GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0783/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 22/04/2024	SAMPLING TIME	: 10:05-10:25, 10:39-10:55
RECEIVED DATE	: 24/04/2024	ANALYTICAL DATE	: 22, 24-26/04/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apir1

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ¹⁾
				MW-09	MW-11	
pH	-	4500-H ⁺ B	< 0.10	7.45	7.75	1)
Conductivity	µS/cm	2510 B	< 1.0	1,375	747	-
Salinity	ppt	2520 B	< 0.01	0.65	0.30	-
Arsenic (As)	mg/l	3114 C	< 0.0001	0.0032	0.0087	≤ 0.1
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	ND	≤ 2.0
Lead (Pb)	mg/l	3120 B	< 0.008	ND	ND	≤ 4.0
Mercury (Hg)	mg/l	3112 B	< 0.0001	ND	ND	≤ 0.7
Nickel (Ni)	mg/l	3120 B	< 0.002	ND	< 0.01	≤ 5.0

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

Khemchuda Insorn

(Miss Khemchuda Insorn)

Analyst

REG. NO. 7-239-n-0005

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-n-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0783/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 22/04/2024	SAMPLING TIME	: 10:05-10:25, 10:39-10:55
RECEIVED DATE	: 24/04/2024	ANALYTICAL DATE	: 26/04/2024, 01-05/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apir1

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ¹⁾
				MW-09	MW-11	
Naphthalene	mg/l	6440 C	< 0.00005	ND	ND	≤ 48
Benzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 0.2
Ethylbenzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 2.0
Toluene	mg/l	6200 B	< 0.0002	ND	ND	≤ 5.0
m-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
o-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
p-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
Total Xylenes	mg/l	6200 B	< 0.0006	ND	ND	≤ 24

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

Jutarat Jaemruen

(Miss Jutarat Jaemruen)

Analyst

REG. NO. 7-239-n-0022

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-n-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL., Branch 6 (Refinery)	REQUEST SERVICE No	: 0783/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 22/04/2024	SAMPLING TIME	: 10:05-10:25, 10:39-10:55
RECEIVED DATE	: 24/04/2024	ANALYTICAL DATE	: 25/04/2024-04/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS	ND	STATION		STANDARD ^U
		METHODS	(non-detectable)	MW-09	MW-11	
Total Petroleum Hydrocarbons						
- TPH (C ₃ - C ₉)	mg/l	5030 C / 8260 D	< 0.003	ND	ND	≤ 1.4
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
- TPH (C ₉ - C ₁₆)	mg/l	3510 C / 8015 D	< 0.025	ND	ND	≤ 1.7
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
- TPH (C ₁₆ - C ₃₃)	mg/l	3510 C / 8015 D	< 0.050	ND	ND	≤ 0.1
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- n-Dotriacontane						
- n-Tetracontane						
- Pentatriacontane						

REFERENCE : US EPA SW 846 TEST METHODS FOR EVALUATING WATER AND SOLID WASTE 1st ED. 2020.

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 2-239-0-0001

AR

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 2-239-0-0004

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

GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL., Branch 6 (Refinery)	REQUEST SERVICE No	: 0783/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 22/04/2024	SAMPLING TIME	: 10:05-10:25, 10:39-10:55
RECEIVED DATE	: 24/04/2024	ANALYTICAL DATE	: 25/04/2024-09/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^U
				MW-09	MW-11	
alpha-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
gamma-BHC	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
Heptachlor	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.01
Aldrin	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.003
beta-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.03
delta-BHC	mg/l	6630 B	< 0.000003	ND	ND	-
Heptachlor epoxide	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
o,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endosulfan I	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
gamma-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
alpha-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
p,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Dieldrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.003
o,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 1.0
o,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
p,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endosulfan II	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
p,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endrin aldehyde	mg/l	6630 B	< 0.000001	ND	ND	-
Endosulfan Sulfate	mg/l	6630 B	< 0.000003	ND	ND	-
Endrin ketone	mg/l	6630 B	< 0.000003	ND	ND	-

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

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 2-239-0-0001

AR

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 2-239-0-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0810/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 25/04/2024	SAMPLING TIME	: 14:12-14:28, 14:49-15:04
RECEIVED DATE	: 29/04/2024	ANALYTICAL DATE	: 25, 29/04/2024-03/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khotamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^u
				MW-12	MW-14	
pH	-	4500-H ⁺ B	< 0.10	7.65	7.72	- ^u
Conductivity	µS/cm	2510 B	< 1.0	9,490	7,294	-
Salinity	ppt	2520 B	< 0.01	5.2	3.9	-
Arsenic (As)	mg/l	3114 C	< 0.0001	0.0102	0.0046	≤ 0.1
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	ND	≤ 2.0
Lead (Pb)	mg/l	3120 B	< 0.008	ND	ND	≤ 4.0
Mercury (Hg)	mg/l	3112 B	< 0.0001	ND	ND	≤ 0.7
Nickel (Ni)	mg/l	3120 B	< 0.002	ND	ND	≤ 5.0

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

(Miss Khemchuda Insorn)

Analyst

REG. NO. 7-239-R-0005

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-R-0004

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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0810/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 25/04/2024	SAMPLING TIME	: 14:12-14:28, 14:49-15:04
RECEIVED DATE	: 29/04/2024	ANALYTICAL DATE	: 01-10/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khotamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^u
				MW-12	MW-14	
Naphthalene	mg/l	6440 C	< 0.00005	ND	ND	≤ 48
Benzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 0.2
Ethylbenzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 2.0
Toluene	mg/l	6200 B	< 0.0002	ND	ND	≤ 5.0
m-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
o-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
p-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
Total Xylenes	mg/l	6200 B	< 0.0006	ND	ND	≤ 24

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

(Miss Jutarat Jaemruen)

Analyst

REG. NO. 7-239-R-0022

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-R-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0810/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 25/04/2024	SAMPLING TIME	: 14:12-14:28, 14:49-15:04
RECEIVED DATE	: 29/04/2024	ANALYTICAL DATE	: 30/04/2024-10/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^U
				MW-12	MW-14	
Total Petroleum Hydrocarbons						
- TPH (C ₇ - C ₁₆)	mg/l	5030 C / 8260 D	< 0.003	ND	ND	≤ 1.4
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
- TPH (C ₁₄ - C ₁₈)	mg/l	3510 C / 8015 D	< 0.025	ND	ND	≤ 1.7
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
- TPH (C ₁₆ - C ₃₂)	mg/l	3510 C / 8015 D	< 0.050	ND	0.089	≤ 0.1
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- n-Dotriacontane						
- n-Tetracontane						
- Pentatriacontane						

REFERENCE : US EPA SW 846 TEST METHODS FOR EVALUATING WATER AND SOLID WASTE, 3rd ED., 2008.

Sudaporn S.
(Miss Sudaporn Soonthorn)
Analyst
REG. NO. 2-239-9-0001

(Mrs. Araya Tipparuk)
Technical Management Team
REG. NO. 2-239-9-0004

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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0810/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 25/04/2024	SAMPLING TIME	: 14:12-14:28, 14:49-15:04
RECEIVED DATE	: 29/04/2024	ANALYTICAL DATE	: 01-09/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^U
				MW-12	MW-14	
alpha-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
gamma-BHC	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
Heptachlor	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.01
Aldrin	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.003
beta-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.03
delta-BHC	mg/l	6630 B	< 0.000003	ND	ND	-
Heptachlor epoxide	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
o,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endosulfan I	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
gamma-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
alpha-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
p,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Dieldrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.003
o,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 1.0
o,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
p,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endosulfan II	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
p,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endrin aldehyde	mg/l	6630 B	< 0.000001	ND	ND	-
Endosulfan Sulfate	mg/l	6630 B	< 0.000003	ND	ND	-
Endrin ketone	mg/l	6630 B	< 0.000003	ND	ND	-

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

Sudaporn S.
(Miss Sudaporn Soonthorn)
Analyst
REG. NO. 2-239-9-0001

(Mrs. Araya Tipparuk)
Technical Management Team
REG. NO. 2-239-9-0004

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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
TEL. (662) 959-3600 FAX (662) 959-3535 Website: secot.co.th E-mail: envserv@secot.co.th

GROUND WATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical PCL, Branch 6 (Refinery) REQUEST SERVICE No. : 0783/67
SAMPLING BY : SECOT Co., Ltd. SAMPLING METHOD : Pneumatic Bladder Pump
SAMPLING DATE : 22/04/2024 SAMPLING TIME : 11:10-11:30, 14:30-14:46
RECEIVED DATE : 24/04/2024 ANALYTICAL DATE : 22, 24-26/04/2024
REPORT DATE : 15/05/2024 SITE OPERATOR : Mr. Jeerawat Khothamhan
SAMPLE CONDITION : Normal FILE CODE : 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^u
				MW-13	MW-15	
pH	-	4500-H ⁺ B	< 0.10	7.88	7.63	u
Conductivity	µS/cm	2510 B	< 1.0	514	1,106	-
Salinity	ppt	2520 B	< 0.01	0.18	0.50	-
Arsenic (As)	mg/l	3114 C	< 0.0001	0.0055	0.0009	≤ 0.1
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	ND	≤ 2.0
Lead (Pb)	mg/l	3120 B	< 0.008	ND	ND	≤ 4.0
Mercury (Hg)	mg/l	3112 B	< 0.0001	ND	ND	≤ 0.7
Nickel (Ni)	mg/l	3120 B	< 0.002	< 0.01	< 0.01	≤ 5.0

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

(Miss Khemchuda Insorn)

Analyst

REG. NO. 2-239-n-0005

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 2-239-n-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical PCL, Branch 6 (Refinery) REQUEST SERVICE No. : 0783/67
SAMPLING BY : SECOT Co., Ltd. SAMPLING METHOD : Pneumatic Bladder Pump
SAMPLING DATE : 22/04/2024 SAMPLING TIME : 11:10-11:30, 14:30-14:46
RECEIVED DATE : 24/04/2024 ANALYTICAL DATE : 26/04/2024, 01-05/05/2024
REPORT DATE : 15/05/2024 SITE OPERATOR : Mr. Jeerawat Khothamhan
SAMPLE CONDITION : Normal FILE CODE : 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^u
				MW-13	MW-15	
Naphthalene	mg/l	6440 C	< 0.00005	ND	ND	≤ 48
Benzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 0.2
Ethylbenzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 2.0
Toluene	mg/l	6200 B	< 0.0002	ND	ND	≤ 5.0
m-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
o-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
p-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
Total Xylenes	mg/l	6200 B	< 0.0006	ND	ND	≤ 24

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

(Miss Jutarat Jaemruen)

Analyst

REG. NO. 2-239-n-0022

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 2-239-n-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0783/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 22/04/2024	SAMPLING TIME	: 11:10-11:30, 14:30-14:46
RECEIVED DATE	: 24/04/2024	ANALYTICAL DATE	: 25/04/2024-04/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^U
				MW-13	MW-15	
Total Petroleum Hydrocarbons						
- TPH (C ₇ - C ₉)	mg/l	5030 C / 8260 D	< 0.003	ND	ND	≤ 1.4
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
- TPH (C ₁₀ - C ₁₆)	mg/l	3510 C / 8015 D	< 0.025	ND	ND	≤ 1.7
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
- TPH (C ₁₆ - C ₂₁)	mg/l	3510 C / 8015 D	< 0.050	ND	ND	≤ 0.1
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- n-Dotriacontane						
- n-Tetratriacontane						
- Pentatriacontane						

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

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-9-0001

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-9-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0783/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 22/04/2024	SAMPLING TIME	: 11:10-11:30, 14:30-14:46
RECEIVED DATE	: 24/04/2024	ANALYTICAL DATE	: 25/04/2024-09/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^U
				MW-13	MW-15	
alpha-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
gamma-BHC	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
Heptachlor	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.01
Aldrin	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.003
beta-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.03
delta-BHC	mg/l	6630 B	< 0.000003	ND	ND	-
Heptachlor epoxide	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
o,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endosulfan I	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
gamma-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
alpha-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
p,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Dieldrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.003
o,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 1.0
o,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
p,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endosulfan II	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
p,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endrin aldehyde	mg/l	6630 B	< 0.000001	ND	ND	-
Endosulfan Sulfate	mg/l	6630 B	< 0.000003	ND	ND	-
Endrin ketone	mg/l	6630 B	< 0.000003	ND	ND	-

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

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-9-0001

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-9-0004

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4. - Not available.



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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
TEL. (662) 959-3600 FAX (662) 959-3535 Website: secot.co.th E-mail: envserv@secot.co.th

GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0810/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 25-26/04/2024	SAMPLING TIME	: 15:24-15:50, 15:38-15:56
RECEIVED DATE	: 29/04/2024	ANALYTICAL DATE	: 25-26, 29/04/2024-03/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khotamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apir1

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^u
				MW-16	MW-18	
pH	-	4500-H ⁺ B	< 0.10	7.88	7.75	u
Conductivity	µS/cm	2510 B	< 1.0	2,723	650	-
Salinity	ppt	2520 B	< 0.01	1.4	0.24	-
Arsenic (As)	mg/l	3114 C	< 0.0001	0.0060	0.0072	≤ 0.1
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	ND	≤ 2.0
Lead (Pb)	mg/l	3120 B	< 0.008	ND	ND	≤ 4.0
Mercury (Hg)	mg/l	3112 B	< 0.0001	ND	ND	≤ 0.7
Nickel (Ni)	mg/l	3120 B	< 0.002	ND	ND	≤ 5.0

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

Khanchuda Insorn

(Miss Khanchuda Insorn)

Analyst

REG. NO. 7-239-n-0005

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-n-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0810/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 25-26/04/2024	SAMPLING TIME	: 15:24-15:50, 15:38-15:56
RECEIVED DATE	: 29/04/2024	ANALYTICAL DATE	: 01-10/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khotamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apir1

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^u
				MW-16	MW-18	
Naphthalene	mg/l	6440 C	< 0.00005	ND	ND	≤ 48
Benzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 0.2
Ethylbenzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 2.0
Toluene	mg/l	6200 B	< 0.0002	ND	ND	≤ 5.0
m-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
o-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
p-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
Total Xylenes	mg/l	6200 B	< 0.0006	ND	ND	≤ 24

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

Jutarat Jaemruen

(Miss Jutarat Jaemruen)

Analyst

REG. NO. 7-239-n-0022

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-n-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0810/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 25-26/04/2024	SAMPLING TIME	: 15:24-15:50, 15:38-15:56
RECEIVED DATE	: 29/04/2024	ANALYTICAL DATE	: 30/04/2024-10/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apirl

PARAMETER	UNIT	ANALYSIS	ND	STATION		STANDARD ^{1/}
		METHODS	(non-detectable)	MW-16	MW-18	
<u>Total Petroleum Hydrocarbons</u>						
- TPH (C ₅ - C ₉)	mg/l	5030 C / 8260 D	< 0.003	ND	ND	≤ 1.4
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
- TPH (C ₈ - C ₁₆)	mg/l	3510 C / 8015 D	< 0.025	ND	ND	≤ 1.7
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
- TPH (C ₁₆ - C ₃₅)	mg/l	3510 C / 8015 D	< 0.050	ND	ND	≤ 0.1
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- n-Dotriacontane						
- n-Tetracontane						
- Pentatriacontane						

REFERENCE : US EPA SW 846 TEST METHODS FOR EVALUATING WATER AND SOLID WASTE 1st ED. 2020.

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 2-239-0-0001

MR

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 2-239-0-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0810/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 25-26/04/2024	SAMPLING TIME	: 15:24-15:50, 15:38-15:56
RECEIVED DATE	: 29/04/2024	ANALYTICAL DATE	: 01-09/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apirl

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^{1/}
				MW-16	MW-18	
alpha-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
gamma-BHC	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
Heptachlor	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.01
Aldrin	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.003
beta-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.03
delta-BHC	mg/l	6630 B	< 0.000003	ND	ND	-
Heptachlor epoxide	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
o,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endosulfan I	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
gamma-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
alpha-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
p,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Dieldrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.003
o,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 1.0
o,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
p,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endosulfan II	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
p,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endrin aldehyde	mg/l	6630 B	< 0.000001	ND	ND	-
Endosulfan Sulfate	mg/l	6630 B	< 0.000003	ND	ND	-
Endrin ketone	mg/l	6630 B	< 0.000003	ND	ND	-

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

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 2-239-0-0001

MR

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 2-239-0-0004

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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
TEL. (662) 959-3600 FAX (662) 959-3535 Website: secot.co.th E-mail: envserv@secot.co.th

GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0783/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 22, 23/04/2024	SAMPLING TIME	: 15:00-15:15, 09:41-09:56
RECEIVED DATE	: 24/04/2024	ANALYTICAL DATE	: 22, 23, 24-26/04/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^{1/}
				MW-17	MW-19	
pH	-	4500-H ⁺ B	< 0.10	8.15	7.83	^{1/}
Conductivity	µS/cm	2510 B	< 1.0	232	478	-
Salinity	ppt	2520 B	< 0.01	0.03	0.16	-
Arsenic (As)	mg/l	3114 C	< 0.0001	0.0080	0.0032	≤ 0.1
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	ND	≤ 2.0
Lead (Pb)	mg/l	3120 B	< 0.008	ND	ND	≤ 4.0
Mercury (Hg)	mg/l	3112 B	< 0.0001	ND	ND	≤ 0.7
Nickel (Ni)	mg/l	3120 B	< 0.002	< 0.01	ND	≤ 5.0

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

Khemchuda Insorn

(Miss Khemchuda Insorn)

Analyst

REG. NO. 2-239-n-0005

Araya Tipparak

(Mrs. Araya Tipparak)

Technical Management Team

REG. NO. 2-239-n-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0783/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 22, 23/04/2024	SAMPLING TIME	: 15:00-15:15, 09:41-09:56
RECEIVED DATE	: 24/04/2024	ANALYTICAL DATE	: 26/04/2024, 01-05/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^{1/}
				MW-17	MW-19	
Naphthalene	mg/l	6440 C	< 0.00005	ND	ND	≤ 48
Benzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 0.2
Ethylbenzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 2.0
Toluene	mg/l	6200 B	< 0.0002	ND	ND	≤ 5.0
m-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
o-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
p-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
Total Xylenes	mg/l	6200 B	< 0.0006	ND	ND	≤ 24

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

Jutarat Jaemruen

(Miss Jutarat Jaemruen)

Analyst

REG. NO. 2-239-n-0022

Araya Tipparak

(Mrs. Araya Tipparak)

Technical Management Team

REG. NO. 2-239-n-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0783/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 22, 23/04/2024	SAMPLING TIME	: 15:00-15:15, 09:41-09:56
RECEIVED DATE	: 24/04/2024	ANALYTICAL DATE	: 25/04/2024-04/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^U
				MW-17	MW-19	
Total Petroleum Hydrocarbons						
- TPH (C ₃ - C ₁₀)	mg/l	5030 C / 8260 D	< 0.003	ND	ND	≤ 1.4
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
- TPH (C ₉ - C ₁₆)	mg/l	3510 C / 8015 D	< 0.025	ND	ND	≤ 1.7
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
- TPH (C ₁₄ - C ₃₂)	mg/l	3510 C / 8015 D	< 0.050	ND	ND	≤ 0.1
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- n-Dotriacontane						
- n-Tetracontane						
- n-Pentatriacontane						

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

Sudaporn S.
(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-0-0001

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-0-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0783/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 22, 23/04/2024	SAMPLING TIME	: 15:00-15:15, 09:41-09:56
RECEIVED DATE	: 24/04/2024	ANALYTICAL DATE	: 25/04/2024-09/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^U
				MW-17	MW-19	
alpha-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
gamma-BHC	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
Heptachlor	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.01
Aldrin	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.003
beta-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.03
delta-BHC	mg/l	6630 B	< 0.000003	ND	ND	-
Heptachlor epoxide	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
o,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endosulfan I	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
gamma-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
alpha-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
p,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Dieldrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.003
o,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 1.0
o,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
p,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endosulfan II	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
p,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endrin aldehyde	mg/l	6630 B	< 0.000001	ND	ND	-
Endosulfan Sulfate	mg/l	6630 B	< 0.000003	ND	ND	-
Endrin ketone	mg/l	6630 B	< 0.000003	ND	ND	-

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

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-0-0001

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-0-0004

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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
TEL. (662) 959-3600 FAX (662) 959-3535 Website: secot.co.th E-mail: envserv@secot.co.th

GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0810/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 26/04/2024	SAMPLING TIME	: 15:00-15:16, 14:16-14:25
RECEIVED DATE	: 29/04/2024	ANALYTICAL DATE	: 26, 29/04/2024-03/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khotamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ¹⁾
				MW-20	MW-22	
pH	-	4500-H ⁺ B	< 0.10	7.67	7.79	¹⁾
Conductivity	μS/cm	2510 B	< 1.0	.982	1.027	-
Salinity	ppt	2520 B	< 0.01	0.43	0.45	-
Arsenic (As)	mg/l	3114 C	< 0.0001	0.0043	0.0055	≤ 0.1
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	ND	≤ 2.0
Lead (Pb)	mg/l	3120 B	< 0.008	ND	ND	≤ 4.0
Mercury (Hg)	mg/l	3112 B	< 0.0001	ND	ND	≤ 0.7
Nickel (Ni)	mg/l	3120 B	< 0.002	ND	ND	≤ 5.0

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

Khemchuda Insom

(Miss Khemchuda Insom)

Analyst

REG. NO. 7-239-ก-0005

MR

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-ก-0004

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

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3. ¹⁾ Notification of the Ministry of Industry, B.E.2559 (2016).

4. - Not available.



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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0810/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 26/04/2024	SAMPLING TIME	: 15:00-15:16, 14:16-14:25
RECEIVED DATE	: 29/04/2024	ANALYTICAL DATE	: 01-10/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khotamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ¹⁾
				MW-20	MW-22	
Naphthalene	mg/l	6440 C	< 0.00005	ND	ND	≤ 48
Benzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 0.2
Ethylbenzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 2.0
Toluene	mg/l	6200 B	< 0.0002	ND	ND	≤ 5.0
m-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
o-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
p-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
Total Xylenes	mg/l	6200 B	< 0.0006	ND	ND	≤ 24

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

Jutarat Jaemruen

(Miss Jutarat Jaemruen)

Analyst

REG. NO. 7-239-ก-0022

MR

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-ก-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0810/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 26/04/2024	SAMPLING TIME	: 15:00-15:16, 14:16-14:25
RECEIVED DATE	: 29/04/2024	ANALYTICAL DATE	: 30/04/2024-10/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khotamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apirl

PARAMETER	UNIT	ANALYSIS	ND	STATION		STANDARD ^u
		METHODS	(non-detectable)	MW-20	MW-22	
Total Petroleum Hydrocarbons						
- TPH (C ₅ - C ₆)	mg/l	5030 C / 8260 D	< 0.003	ND	ND	≤ 1.4
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
- TPH (C ₈ - C ₁₆)	mg/l	3510 C / 8015 D	< 0.025	ND	ND	≤ 1.7
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
- TPH (C ₁₆ - C ₃₅)	mg/l	3510 C / 8015 D	< 0.050	ND	ND	≤ 0.1
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- n-Dotriacontane						
- n-Tetatriacontane						
- Pentatriacontane						

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

Sudaporn S.
(Miss Sudaporn Soonthorn)
Analyst

REG. NO. 2-239-ท-0001

(Mrs. Araya Tipparuk)
Technical Management Team
REG. NO. 2-239-ท-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0810/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 26/04/2024	SAMPLING TIME	: 15:00-15:16, 14:16-14:25
RECEIVED DATE	: 29/04/2024	ANALYTICAL DATE	: 01-09/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khotamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apirl

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^u
				MW-20	MW-22	
alpha-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
gamma-BHC	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
Heptachlor	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.01
Aldrin	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.003
beta-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.03
delta-BHC	mg/l	6630 B	< 0.000003	ND	ND	-
Heptachlor epoxide	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
o,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endosulfan I	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
gamma-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
alpha-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
p,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Dieldrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.003
o,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 1.0
o,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
p,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endosulfan II	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
p,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endrin aldehyde	mg/l	6630 B	< 0.000001	ND	ND	-
Endosulfan Sulfate	mg/l	6630 B	< 0.000003	ND	ND	-
Endrin ketone	mg/l	6630 B	< 0.000003	ND	ND	-

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

Sudaporn S.
(Miss Sudaporn Soonthorn)
Analyst
REG. NO. 2-239-ท-0001

(Mrs. Araya Tipparuk)
Technical Management Team
REG. NO. 2-239-ท-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0783/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 23/04/2024	SAMPLING TIME	: 10:13-10:35, 10:56-11:14
RECEIVED DATE	: 24/04/2024	ANALYTICAL DATE	: 23, 24-26/04/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khotamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^{1/}
				MW-21	MW-23	
pH	-	4500-H B	< 0.10	7.43	7.53	^{1/}
Conductivity	µS/cm	2510 B	< 1.0	343	753	-
Salinity	ppt	2520 B	< 0.01	0.09	0.30	-
Arsenic (As)	mg/l	3114 C	< 0.0001	< 0.0005	0.0064	≤ 0.1
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	ND	≤ 2.0
Lead (Pb)	mg/l	3120 B	< 0.008	ND	ND	≤ 4.0
Mercury (Hg)	mg/l	3112 B	< 0.0001	ND	ND	≤ 0.7
Nickel (Ni)	mg/l	3120 B	< 0.002	ND	ND	≤ 5.0

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

Khemsuda Insorn

(Miss Khemsuda Insorn)

Analyst

REG. NO. 7-239-P-0005

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-P-0004

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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0783/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 23/04/2024	SAMPLING TIME	: 10:13-10:35, 10:56-11:14
RECEIVED DATE	: 24/04/2024	ANALYTICAL DATE	: 26/04/2024, 01-05/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khotamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^{1/}
				MW-21	MW-23	
Naphthalene	mg/l	6440 C	< 0.00005	ND	ND	≤ 48
Benzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 0.2
Ethylbenzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 2.0
Toluene	mg/l	6200 B	< 0.0002	ND	ND	≤ 5.0
m-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
o-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
p-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
Total Xylenes	mg/l	6200 B	< 0.0006	ND	ND	≤ 24

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

Jutarat Jaemruen

(Miss Jutarat Jaemruen)

Analyst

REG. NO. 7-239-P-0022

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-P-0004

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GROUND WATER ANALYSIS REPORT

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SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 23/04/2024	SAMPLING TIME	: 10:13-10:35, 10:56-11:14
RECEIVED DATE	: 24/04/2024	ANALYTICAL DATE	: 25/04/2024-04/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apirl

PARAMETER	UNIT	ANALYSIS	ND	STATION		STANDARD ^U
		METHODS	(non-detectable)	MW-21	MW-23	
Total Petroleum Hydrocarbons						
- TPH (C ₃ - C ₉)	mg/l	5030 C / 8260 D	< 0.003	ND	0.009	≤ 1.4
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
- TPH (C ₁₀ - C ₁₅)	mg/l	3510 C / 8015 D	< 0.025	0.096	0.025	≤ 1.7
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
- TPH (C ₁₆ - C ₃₅)	mg/l	3510 C / 8015 D	< 0.050	ND	ND	≤ 0.1
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- n-Dotriacontane						
- n-Tetatriacontane						
- Pentatriacontane						

REFERENCE : US EPA SW 846 TEST METHODS FOR EVALUATING WATER AND SOLID WASTE 3rd ED. 2010.

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-0-0001

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-0-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0783/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 23/04/2024	SAMPLING TIME	: 10:13-10:35, 10:56-11:14
RECEIVED DATE	: 24/04/2024	ANALYTICAL DATE	: 25/04/2024-09/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apirl

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^U
				MW-21	MW-23	
alpha-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
gamma-BHC	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
Heptachlor	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.01
Aldrin	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.003
beta-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.03
delta-BHC	mg/l	6630 B	< 0.000003	ND	ND	-
Heptachlor epoxide	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
o,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endosulfan I	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
gamma-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
alpha-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
p,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Dieldrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.003
o,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 1.0
o,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
p,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endosulfan II	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
p,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endrin aldehyde	mg/l	6630 B	< 0.000001	ND	ND	-
Endosulfan Sulfate	mg/l	6630 B	< 0.000003	ND	ND	-
Endrin ketone	mg/l	6630 B	< 0.000003	ND	ND	-

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

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-0-0001

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-0-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical PCL, Branch 6 (Refinery) REQUEST SERVICE No. : 0810/67
SAMPLING BY : SECOT Co., Ltd. SAMPLING METHOD : Pneumatic Bladder Pump
SAMPLING DATE : 26/04/2024 SAMPLING TIME : 10:51-11:08, 10:14-13:30
RECEIVED DATE : 29/04/2024 ANALYTICAL DATE : 26, 29/04/2024-03/05/2024
REPORT DATE : 15/05/2024 SITE OPERATOR : Mr. Jeerawat Khothamhan
SAMPLE CONDITION : Normal FILE CODE : 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^u
				MW-24	MW-25	
pH	-	4500-H B	< 0.10	7.80	7.53	^u
Conductivity	µS/cm	2510 B	< 1.0	9,188	424	-
Salinity	ppt	2520 B	< 0.01	5.1	0.14	-
Arsenic (As)	mg/l	3114 C	< 0.0001	0.0116	0.0321	≤ 0.1
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	ND	≤ 2.0
Lead (Pb)	mg/l	3120 B	< 0.008	ND	ND	≤ 4.0
Mercury (Hg)	mg/l	3112 B	< 0.0001	ND	ND	≤ 0.7
Nickel (Ni)	mg/l	3120 B	< 0.002	ND	ND	≤ 5.0

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

Khemchuda Insorn

(Miss Khemchuda Insorn)

Analyst

REG. NO. 7-239-ก-0005

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-ก-0004

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3. ^u Notification of the Ministry of Industry, B.E.2559 (2016).

4. - Not available.



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

GROUND WATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical PCL, Branch 6 (Refinery) REQUEST SERVICE No. : 0810/67
SAMPLING BY : SECOT Co., Ltd. SAMPLING METHOD : Pneumatic Bladder Pump
SAMPLING DATE : 26/04/2024 SAMPLING TIME : 10:51-11:08, 10:14-13:30
RECEIVED DATE : 29/04/2024 ANALYTICAL DATE : 01-10/05/2024
REPORT DATE : 15/05/2024 SITE OPERATOR : Mr. Jeerawat Khothamhan
SAMPLE CONDITION : Normal FILE CODE : 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^u
				MW-24	MW-25	
Naphthalene	mg/l	6440 C	< 0.00005	ND	ND	≤ 48
Benzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 0.2
Ethylbenzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 2.0
Toluene	mg/l	6200 B	< 0.0002	ND	ND	≤ 5.0
m-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
o-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
p-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
Total Xylenes	mg/l	6200 B	< 0.0006	ND	ND	≤ 24

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

Jutarat Jaemruen

(Miss Jutarat Jaemruen)

Analyst

REG. NO. 7-239-ก-0022

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-ก-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0810/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 26/04/2024	SAMPLING TIME	: 10:51-11:08, 10:14-13:30
RECEIVED DATE	: 29/04/2024	ANALYTICAL DATE	: 30/04/2024-10/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khotamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apirl

PARAMETER	UNIT	ANALYSIS	ND	STATION		STANDARD ^U
		METHODS	(non-detectable)	MW-24	MW-25	
Total Petroleum Hydrocarbons						
- TPH (C ₅ - C ₈)	mg/l	5030 C / 8260 D	< 0.003	ND	ND	≤ 1.4
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
- TPH (C ₉ - C ₁₆)	mg/l	3510 C / 8015 D	< 0.025	ND	ND	≤ 1.7
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
- TPH (C ₁₇ - C ₃₅)	mg/l	3510 C / 8015 D	< 0.050	ND	ND	≤ 0.1
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- n-Dotriacontane						
- n-Tetatriacontane						
- Pentatriacontane						

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

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-P-0001

Mrs. Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-P-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0810/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 26/04/2024	SAMPLING TIME	: 10:51-11:08, 10:14-13:30
RECEIVED DATE	: 29/04/2024	ANALYTICAL DATE	: 01-09/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khotamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apirl

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^{1/}
				MW-24	MW-25	
alpha-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
gamma-BHC	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
Heptachlor	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.01
Aldrin	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.003
beta-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.03
delta-BHC	mg/l	6630 B	< 0.000003	ND	ND	-
Heptachlor epoxide	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
o,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endosulfan I	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
gamma-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
alpha-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
p,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Dieldrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.003
o,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 1.0
o,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
p,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endosulfan II	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
p,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endrin aldehyde	mg/l	6630 B	< 0.000001	ND	ND	-
Endosulfan Sulfate	mg/l	6630 B	< 0.000003	ND	ND	-
Endrin ketone	mg/l	6630 B	< 0.000003	ND	ND	-

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

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-P-0001

Mrs. Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-P-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical PCL, Branch 6 (Refinery) REQUEST SERVICE No. : 0810/67
SAMPLING BY : SECOT Co., Ltd. SAMPLING METHOD : Pneumatic Bladder Pump
SAMPLING DATE : 26/04/2024 SAMPLING TIME : 09:37-09:54
RECEIVED DATE : 29/04/2024 ANALYTICAL DATE : 26, 29/04/2024-03/05/2024
REPORT DATE : 15/05/2024 SITE OPERATOR : Mr. Jeerawat Khothamhan
SAMPLE CONDITION : Normal FILE CODE : 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS	ND	STATION		STANDARD ¹
		METHODS	(non-detectable)	MW-26		
pH	-	4500-H ⁺ B	< 0.10	7.53		U
Conductivity	µS/cm	2510 B	< 1.0	617		-
Salinity	ppt	2520 B	< 0.01	0.23		-
Arsenic (As)	mg/l	3114 C	< 0.0001	0.0147		≤ 0.1
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND		≤ 2.0
Lead (Pb)	mg/l	3120 B	< 0.008	ND		≤ 4.0
Mercury (Hg)	mg/l	3112 B	< 0.0001	ND		≤ 0.7
Nickel (Ni)	mg/l	3120 B	< 0.002	ND		≤ 5.0

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 22nd ED. 2017 (AWWA, APHA, WEF)

(Miss Khemchuda Insom)

Analyst

REG. NO. 7-239-n-0005

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-n-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical PCL, Branch 6 (Refinery) REQUEST SERVICE No. : 0810/67
SAMPLING BY : SECOT Co., Ltd. SAMPLING METHOD : Pneumatic Bladder Pump
SAMPLING DATE : 26/04/2024 SAMPLING TIME : 09:37-09:54
RECEIVED DATE : 29/04/2024 ANALYTICAL DATE : 01-10/05/2024
REPORT DATE : 15/05/2024 SITE OPERATOR : Mr. Jeerawat Khothamhan
SAMPLE CONDITION : Normal FILE CODE : 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION	STANDARD ^U
				MW-26	
Naphthalene	mg/l	6440 C	< 0.00005	ND	≤ 48
Benzene	mg/l	6200 B	< 0.0002	ND	≤ 0.2
Ethylbenzene	mg/l	6200 B	< 0.0002	ND	≤ 2.0
Toluene	mg/l	6200 B	< 0.0002	ND	≤ 5.0
m-Xylene	mg/l	6200 B	< 0.0002	ND	≤ 24
o-Xylene	mg/l	6200 B	< 0.0002	ND	≤ 24
p-Xylene	mg/l	6200 B	< 0.0002	ND	≤ 24
Total Xylenes	mg/l	6200 B	< 0.0006	ND	≤ 24

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 22nd ED. 2017 (AWWA, APHA, WEF)

(Miss Jutarat Jaemruen)

Analyst

REG. NO. 7-239-n-0022

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-n-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0810/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 26/04/2024	SAMPLING TIME	: 09:37-09:54
RECEIVED DATE	: 29/04/2024	ANALYTICAL DATE	: 30/04/2024-10/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khotamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apir1

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION MW-26	STANDARD ^{1/}
Total Petroleum Hydrocarbons					
- TPH (C ₃ - C ₉)	mg/l	5030 C / 8260 D	< 0.003	ND	≤ 1.4
- Pentane					
- Benzene					
- m,p-Xylene					
- o-Xylene					
- Ethylbenzene					
- TPH (C ₉ - C ₁₆)	mg/l	3510 C / 8015 D	< 0.025	ND	≤ 1.7
- n-Nonane					
- n-Decane					
- n-Dodecane					
- n-Tetradecane					
- n-Hexadecane					
- TPH (C ₁₆ - C ₂₅)	mg/l	3510 C / 8015 D	< 0.050	ND	≤ 0.1
- n-Octadecane					
- n-Eicosane					
- n-Docosane					
- n-Tetracosane					
- n-Hexacosane					
- n-Octacosane					
- n-Triacontane					
- n-Dotriacontane					
- n-Tetracontane					
- Pentatriacontane					

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

Sudaporn S.
(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-0-0001

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-0-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0810/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 26/04/2024	SAMPLING TIME	: 09:37-09:54
RECEIVED DATE	: 29/04/2024	ANALYTICAL DATE	: 01-09/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khotamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apir1

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION MW-26	STANDARD ^{1/}
alpha-BHC	mg/l	6630 B	< 0.000001	ND	≤ 0.01
gamma-BHC	mg/l	6630 B	< 0.000003	ND	≤ 0.04
Heptachlor	mg/l	6630 B	< 0.000003	ND	≤ 0.01
Aldrin	mg/l	6630 B	< 0.000001	ND	≤ 0.003
beta-BHC	mg/l	6630 B	< 0.000001	ND	≤ 0.03
delta-BHC	mg/l	6630 B	< 0.000003	ND	-
Heptachlor epoxide	mg/l	6630 B	< 0.000001	ND	≤ 0.01
o,p'-DDE	mg/l	6630 B	< 0.000003	ND	≤ 0.1
Endosulfan I	mg/l	6630 B	< 0.000003	ND	≤ 14
gamma-Chlordane	mg/l	6630 B	< 0.000003	ND	≤ 0.04
alpha-Chlordane	mg/l	6630 B	< 0.000003	ND	≤ 0.04
p,p'-DDE	mg/l	6630 B	< 0.000003	ND	≤ 0.1
Dieldrin	mg/l	6630 B	< 0.000003	ND	≤ 0.003
o,p'-DDD	mg/l	6630 B	< 0.000003	ND	≤ 0.2
Endrin	mg/l	6630 B	< 0.000003	ND	≤ 1.0
o,p'-DDT	mg/l	6630 B	< 0.000003	ND	≤ 0.1
p,p'-DDD	mg/l	6630 B	< 0.000003	ND	≤ 0.2
Endosulfan II	mg/l	6630 B	< 0.000003	ND	≤ 14
p,p'-DDT	mg/l	6630 B	< 0.000003	ND	≤ 0.1
Endrin aldehyde	mg/l	6630 B	< 0.000001	ND	-
Endosulfan Sulfate	mg/l	6630 B	< 0.000003	ND	-
Endrin ketone	mg/l	6630 B	< 0.000003	ND	-

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

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-0-0001

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-0-0004

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

GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0783/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 23/04/2024	SAMPLING TIME	: 14:04-14:30, 14:53-15:09
RECEIVED DATE	: 24/04/2024	ANALYTICAL DATE	: 23, 24-26/04/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khotamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^{1/}
				MW-27	MW-29	
pH	-	4500-H ⁺ B	< 0.10	7.87	7.18	1/
Conductivity	µS/cm	2510 B	< 1.0	592	862	-
Salinity	ppt	2520 B	< 0.01	0.22	0.35	-
Arsenic (As)	mg/l	3114 C	< 0.0001	0.0050	0.0016	≤ 0.1
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	ND	≤ 2.0
Lead (Pb)	mg/l	3120 B	< 0.008	ND	ND	≤ 4.0
Mercury (Hg)	mg/l	3112 B	< 0.0001	ND	ND	≤ 0.7
Nickel (Ni)	mg/l	3120 B	< 0.002	ND	ND	≤ 5.0

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

(Miss Khemchuda Insorn)

Analyst

REG. NO. 7-239-0-0005

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-0-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0783/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 23/04/2024	SAMPLING TIME	: 14:04-14:30, 14:53-15:09
RECEIVED DATE	: 24/04/2024	ANALYTICAL DATE	: 26/04/2024, 01-05/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khotamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^{1/}
				MW-27	MW-29	
Naphthalene	mg/l	6440 C	< 0.00005	ND	ND	≤ 48
Benzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 0.2
Ethylbenzene	mg/l	6200 B	< 0.0002	ND	0.0002	≤ 2.0
Toluene	mg/l	6200 B	< 0.0002	ND	ND	≤ 5.0
m-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
o-Xylene	mg/l	6200 B	< 0.0002	ND	0.0003	≤ 24
p-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
Total Xylenes	mg/l	6200 B	< 0.0006	ND	ND	≤ 24

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

(Miss Jutarat Jaemruen)

Analyst

REG. NO. 7-239-0-0022

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-0-0004

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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND

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

GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0783/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 23/04/2024	SAMPLING TIME	: 14:04-14:30, 14:53-15:09
RECEIVED DATE	: 24/04/2024	ANALYTICAL DATE	: 25/04/2024-04/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apirl

PARAMETER	UNIT	ANALYSIS	ND	STATION		STANDARD ^U
		METHODS	(non-detectable)	MW-27	MW-29	
Total Petroleum Hydrocarbons						
- TPH (C ₃ - C ₉)	mg/l	5030 C / 8260 D	< 0.003	ND	0.052	≤ 1.4
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
- TPH (C ₉₋₁₆ - C ₁₆)	mg/l	3510 C / 8015 D	< 0.025	ND	0.064	≤ 1.7
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
- TPH (C ₁₆₋₃₃ - C ₃₃)	mg/l	3510 C / 8015 D	< 0.050	ND	ND	≤ 0.1
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- n-Dotriacontane						
- n-Tetracontane						
- Pentatriacontane						

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

Sudaporn S.
(Miss Sudaporn Soonthorn)
Analyst

REG. NO. 7-239-9-0001

NTL
(Mrs. Araya Tipparak)
Technical Management Team

REG. NO. 7-239-9-0004

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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND

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

GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0783/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 23/04/2024	SAMPLING TIME	: 14:04-14:30, 14:53-15:09
RECEIVED DATE	: 24/04/2024	ANALYTICAL DATE	: 25/04/2024-09/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apirl

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^u
				MW-27	MW-29	
alpha-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
gamma-BHC	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
Heptachlor	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.01
Aldrin	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.003
beta-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.03
delta-BHC	mg/l	6630 B	< 0.000003	ND	ND	-
Heptachlor epoxide	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
o,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endosulfan I	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
gamma-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
alpha-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
p,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Dieldrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.003
o,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 1.0
o,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
p,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endosulfan II	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
p,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endrin aldehyde	mg/l	6630 B	< 0.000001	ND	ND	-
Endosulfan Sulfate	mg/l	6630 B	< 0.000003	ND	ND	-
Endrin ketone	mg/l	6630 B	< 0.000003	ND	ND	-

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 19th ED. 2017 IAWQA, APHA, WHO

Sudaporn S.
(Miss Sudaporn Soonthorn)
Analyst
REG. NO. 7-239-9-0001

NTL
(Mrs. Araya Tipparak)
Technical Management Team
REG. NO. 7-239-9-0004

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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
TEL. (662) 959-3600 FAX (662) 959-3535 Website: secot.co.th E-mail: envserv@secot.co.th

GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0793/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 24/04/2024	SAMPLING TIME	: 15:38-15:56, 14:54-15:11
RECEIVED DATE	: 25/04/2024	ANALYTICAL DATE	: 24, 25-29/04/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_April

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^u
				MW-28	MW-30	
pH	-	4500-H ⁺ B	< 0.10	7.98	7.73	u
Conductivity	µS/cm	2510 B	< 1.0	316	446	-
Salinity	ppt	2520 B	< 0.01	0.07	0.14	-
Arsenic (As)	mg/l	3114 C	< 0.0001	0.0041	0.0140	≤ 0.1
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	ND	≤ 2.0
Lead (Pb)	mg/l	3120 B	< 0.008	ND	ND	≤ 4.0
Mercury (Hg)	mg/l	3112 B	< 0.0001	ND	ND	≤ 0.7
Nickel (Ni)	mg/l	3120 B	< 0.002	ND	ND	≤ 5.0

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

Khemchuda Insorn

(Miss Khemchuda Insorn)

Analyst

REG. NO. 7-239-ก-0005

Araya Tippiarak

(Mrs. Araya Tippiarak)

Technical Management Team

REG. NO. 7-239-ก-0004

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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
TEL. (662) 959-3600 FAX (662) 959-3535 Website: secot.co.th E-mail: envserv@secot.co.th

GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0793/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 24/04/2024	SAMPLING TIME	: 15:38-15:56, 14:54-15:11
RECEIVED DATE	: 25/04/2024	ANALYTICAL DATE	: 26/04/2024, 04-05/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_April

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^u
				MW-28	MW-30	
Naphthalene	mg/l	6440 C	< 0.00005	ND	ND	≤ 48
Benzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 0.2
Ethylbenzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 2.0
Toluene	mg/l	6200 B	< 0.0002	ND	ND	≤ 5.0
m-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
o-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
p-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
Total Xylenes	mg/l	6200 B	< 0.0006	ND	ND	≤ 24

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

Jutarat Jaemruen

(Miss Jutarat Jaemruen)

Analyst

REG. NO. 7-239-ก-0022

Araya Tippiarak

(Mrs. Araya Tippiarak)

Technical Management Team

REG. NO. 7-239-ก-0004

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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0793/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 24/04/2024	SAMPLING TIME	: 15:38-15:56, 14:54-15:11
RECEIVED DATE	: 25/04/2024	ANALYTICAL DATE	: 26/04/2024-06/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_April

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^u
				MW-28	MW-30	
Total Petroleum Hydrocarbons						
-TPH (C ₃ - C ₆)	mg/l	5030 C / 8260 D	< 0.003	ND	ND	≤ 1.4
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
-TPH (C ₈ - C ₁₀)	mg/l	3510 C / 8015 D	< 0.025	ND	ND	≤ 1.7
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
-TPH (C ₁₀ - C ₂₅)	mg/l	3510 C / 8015 D	< 0.050	ND	ND	≤ 0.1
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- n-Dotriacontane						
- n-Tetracontane						
- Pentatriacontane						

REFERENCE : US EPA SW 846 TEST METHODS FOR EVALUATING WATER AND SOLID WASTE 1st ED. 2020.

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-0-0001

M

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-0-0004

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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
TEL. (662) 959-3600 FAX (662) 959-3535 Website: secot.co.th E-mail: envserv@secot.co.th

GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0793/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 24/04/2024	SAMPLING TIME	: 15:38-15:56, 14:54-15:11
RECEIVED DATE	: 25/04/2024	ANALYTICAL DATE	: 25/04/2024-09/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_April

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^u
				MW-28	MW-30	
alpha-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
gamma-BHC	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
Heptachlor	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.01
Aldrin	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.003
beta-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.03
delta-BHC	mg/l	6630 B	< 0.000003	ND	ND	-
Heptachlor epoxide	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
o,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endosulfan I	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
gamma-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
alpha-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
p,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Dieldrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.003
o,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 1.0
o,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
p,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endosulfan II	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
p,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endrin aldehyde	mg/l	6630 B	< 0.000001	ND	ND	-
Endosulfan Sulfate	mg/l	6630 B	< 0.000003	ND	ND	-
Endrin ketone	mg/l	6630 B	< 0.000003	ND	ND	-

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

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-0-0001

M

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-0-0004

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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
TEL. (662) 959-3600 FAX (662) 959-3535 Website: secot.co.th E-mail: envserv@secot.co.th

GROUND WATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical PCL, Branch 6 (Refinery) REQUEST SERVICE No. : 0783/67
SAMPLING BY : SECOT Co., Ltd. SAMPLING METHOD : Pneumatic Bladder Pump
SAMPLING DATE : 23/04/2024 SAMPLING TIME : 15:35-15:59
RECEIVED DATE : 24/04/2024 ANALYTICAL DATE : 23, 24-26/04/2024
REPORT DATE : 15/05/2024 SITE OPERATOR : Mr. Jeerawat Khothamhan
SAMPLE CONDITION : Normal FILE CODE : 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^u
				MW-31		
pH	-	4500-H ⁺ B	< 0.10	7.02		^u
Conductivity	µS/cm	2510 B	< 1.0	969		-
Salinity	ppt	2520 B	< 0.01	0.42		-
Arsenic (As)	mg/l	3114 C	< 0.0001	0.0021		≤ 0.1
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND		≤ 2.0
Lead (Pb)	mg/l	3120 B	< 0.008	ND		≤ 4.0
Mercury (Hg)	mg/l	3112 B	< 0.0001	ND		≤ 0.7
Nickel (Ni)	mg/l	3120 B	< 0.002	ND		≤ 5.0

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

(Miss Khemchuda Insorn)

Analyst

REG. NO. 7-239-ท-0005

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-ท-0004

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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
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GROUND WATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical PCL, Branch 6 (Refinery) REQUEST SERVICE No. : 0783/67
SAMPLING BY : SECOT Co., Ltd. SAMPLING METHOD : Pneumatic Bladder Pump
SAMPLING DATE : 23/04/2024 SAMPLING TIME : 15:35-15:59
RECEIVED DATE : 24/04/2024 ANALYTICAL DATE : 26/04/2024, 01-05/05/2024
REPORT DATE : 15/05/2024 SITE OPERATOR : Mr. Jeerawat Khothamhan
SAMPLE CONDITION : Normal FILE CODE : 224010_GW_Apiri

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION	STANDARD ^v
				MW-31	
Naphthalene	mg/l	6440 C	< 0.00005	ND	≤ 48
Benzene	mg/l	6200 B	< 0.0002	ND	≤ 0.2
Ethylbenzene	mg/l	6200 B	< 0.0002	ND	≤ 2.0
Toluene	mg/l	6200 B	< 0.0002	ND	≤ 5.0
m-Xylene	mg/l	6200 B	< 0.0002	ND	≤ 24
o-Xylene	mg/l	6200 B	< 0.0002	ND	≤ 24
p-Xylene	mg/l	6200 B	< 0.0002	ND	≤ 24
Total Xylenes	mg/l	6200 B	< 0.0006	ND	≤ 24

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

(Miss Jutarat Jaemruen)

Analyst

REG. NO. 7-239-ท-0022

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-ท-0004

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SECOT CO., LTD.

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0783/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 23/04/2024	SAMPLING TIME	: 15:35-15:59
RECEIVED DATE	: 24/04/2024	ANALYTICAL DATE	: 25/04/2024-04/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apir1

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION MW-31	STANDARD ^u
Total Petroleum Hydrocarbons					
- TPH (C ₇ - C ₉)	mg/l	5030 C / 8260 D	< 0.003	0.084	≤ 1.4
- Pentane					
- Benzene					
- Toluene					
- m,p-Xylene					
- o-Xylene					
- Ethylbenzene					
- TPH (C ₉ - C ₁₆)	mg/l	3510 C / 8015 D	< 0.025	ND	≤ 1.7
- n-Nonane					
- n-Decane					
- n-Dodecane					
- n-Tetradecane					
- n-Hexadecane					
- TPH (C ₁₆ - C ₂₅)	mg/l	3510 C / 8015 D	< 0.050	ND	≤ 0.1
- n-Octadecane					
- n-Eicosane					
- n-Docosane					
- n-Tetracosane					
- n-Hexacosane					
- n-Octacosane					
- n-Triacontane					
- n-Dotriacontane					
- n-Tetracontane					
- Pentatriacontane					

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

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-9-0001

Mrs. Araya Tippiarak

(Mrs. Araya Tippiarak)

Technical Management Team

REG. NO. 7-239-9-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0783/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 23/04/2024	SAMPLING TIME	: 15:35-15:59
RECEIVED DATE	: 24/04/2024	ANALYTICAL DATE	: 25/04/2024-09/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_Apir1

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION MW-31	STANDARD ^u
alpha-BHC	mg/l	6630 B	< 0.000001	ND	≤ 0.01
gamma-BHC	mg/l	6630 B	< 0.000003	ND	≤ 0.04
Heptachlor	mg/l	6630 B	< 0.000003	ND	≤ 0.01
Aldrin	mg/l	6630 B	< 0.000001	ND	≤ 0.003
beta-BHC	mg/l	6630 B	< 0.000001	ND	≤ 0.03
delta-BHC	mg/l	6630 B	< 0.000003	ND	-
Heptachlor epoxide	mg/l	6630 B	< 0.000001	ND	≤ 0.01
o,p'-DDE	mg/l	6630 B	< 0.000003	ND	≤ 0.1
Endosulfan I	mg/l	6630 B	< 0.000003	ND	≤ 14
gamma-Chlordane	mg/l	6630 B	< 0.000003	ND	≤ 0.04
alpha-Chlordane	mg/l	6630 B	< 0.000003	ND	≤ 0.04
p,p'-DDE	mg/l	6630 B	< 0.000003	ND	≤ 0.1
Dieldrin	mg/l	6630 B	< 0.000003	ND	≤ 0.003
o,p'-DDD	mg/l	6630 B	< 0.000003	ND	≤ 0.2
Endrin	mg/l	6630 B	< 0.000003	ND	≤ 1.0
o,p'-DDT	mg/l	6630 B	< 0.000003	ND	≤ 0.1
p,p'-DDD	mg/l	6630 B	< 0.000003	ND	≤ 0.2
Endosulfan II	mg/l	6630 B	< 0.000003	ND	≤ 14
p,p'-DDT	mg/l	6630 B	< 0.000003	ND	≤ 0.1
Endrin aldehyde	mg/l	6630 B	< 0.000001	ND	-
Endosulfan Sulfate	mg/l	6630 B	< 0.000003	ND	-
Endrin ketone	mg/l	6630 B	< 0.000003	ND	-

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

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-9-0001

Mrs. Araya Tippiarak

(Mrs. Araya Tippiarak)

Technical Management Team

REG. NO. 7-239-9-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical PCL, Branch 6 (Refinery) REQUEST SERVICE No. : 0793/67
SAMPLING BY : SECOT Co., Ltd. SAMPLING METHOD : Pneumatic Bladder Pump
SAMPLING DATE : 24/04/2024 SAMPLING TIME : 14:18-14:35, 10:43-11:08
RECEIVED DATE : 25/04/2024 ANALYTICAL DATE : 24, 25-29/04/2024
REPORT DATE : 15/05/2024 SITE OPERATOR : Mr. Jeerawat Khotamhan
SAMPLE CONDITION : Normal FILE CODE : 224010_GW_April

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^u
				MW-32	MW-33	
pH	-	4500-H ⁺ B	< 0.10	7.97	7.88	^u
Conductivity	µS/cm	2510 B	< 1.0	785	423	-
Salinity	ppt	2520 B	< 0.01	0.31	0.13	-
Arsenic (As)	mg/l	3114 C	< 0.0001	0.0082	0.0047	≤ 0.1
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	ND	≤ 2.0
Lead (Pb)	mg/l	3120 B	< 0.008	ND	ND	≤ 4.0
Mercury (Hg)	mg/l	3112 B	< 0.0001	ND	ND	≤ 0.7
Nickel (Ni)	mg/l	3120 B	< 0.002	ND	ND	≤ 5.0

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

Khemchuda Insorn

(Miss Khemchuda Insorn)

Analyst

REG. NO. 2-239-n-0005

(Mrs. Araya Tipparuk)

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 2-239-n-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical PCL, Branch 6 (Refinery) REQUEST SERVICE No. : 0793/67
SAMPLING BY : SECOT Co., Ltd. SAMPLING METHOD : Pneumatic Bladder Pump
SAMPLING DATE : 24/04/2024 SAMPLING TIME : 14:18-14:35, 10:43-11:08
RECEIVED DATE : 25/04/2024 ANALYTICAL DATE : 26/04/2024, 04-05/05/2024
REPORT DATE : 15/05/2024 SITE OPERATOR : Mr. Jeerawat Khotamhan
SAMPLE CONDITION : Normal FILE CODE : 224010_GW_April

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^u
				MW-32	MW-33	
Naphthalene	mg/l	6440 C	< 0.00005	ND	ND	≤ 48
Benzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 0.2
Ethylbenzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 2.0
Toluene	mg/l	6200 B	< 0.0002	ND	ND	≤ 5.0
m-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
o-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
p-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
Total Xylenes	mg/l	6200 B	< 0.0006	ND	ND	≤ 24

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

Jutarat Jaemruen

(Miss Jutarat Jaemruen)

Analyst

REG. NO. 2-239-n-0022

(Mrs. Araya Tipparuk)

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 2-239-n-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0793/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 24/04/2024	SAMPLING TIME	: 14:18-14:35, 10:43-11:08
RECEIVED DATE	: 25/04/2024	ANALYTICAL DATE	: 26/04/2024-06/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_April

PARAMETER	UNIT	ANALYSIS	ND	STATION		STANDARD ^{1/}
		METHODS	(non-detectable)	MW-32	MW-33	
Total Petroleum Hydrocarbons						
- TPH (C ₃ - C ₄)	mg/l	5030 C / 8260 D	< 0.003	ND	ND	≤ 1.4
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
- TPH (C ₅₋₈ - C ₁₆)	mg/l	3510 C / 8015 D	< 0.025	ND	ND	≤ 1.7
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
- TPH (C ₁₆₋₃₃ - C ₃₃)	mg/l	3510 C / 8015 D	< 0.050	ND	ND	≤ 0.1
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- n-Dotriacontane						
- n-Tetracontane						
- Pentatriacontane						

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

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-9-0001

AR

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-n-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0793/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 24/04/2024	SAMPLING TIME	: 14:18-14:35, 10:43-11:08
RECEIVED DATE	: 25/04/2024	ANALYTICAL DATE	: 25/04/2024-09/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_April

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^{1/}
				MW-32	MW-33	
alpha-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
gamma-BHC	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
Heptachlor	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.01
Aldrin	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.003
beta-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.03
delta-BHC	mg/l	6630 B	< 0.000003	ND	ND	-
Heptachlor epoxide	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
o,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endosulfan I	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
gamma-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
alpha-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
p,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Dieldrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.003
o,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 1.0
o,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
p,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endosulfan II	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
p,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endrin aldehyde	mg/l	6630 B	< 0.000001	ND	ND	-
Endosulfan Sulfate	mg/l	6630 B	< 0.000003	ND	ND	-
Endrin ketone	mg/l	6630 B	< 0.000003	ND	ND	-

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

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-9-0001

AR

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-n-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0793/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 24/04/2024	SAMPLING TIME	: 10:06-10:21, 09:31-09:46
RECEIVED DATE	: 25/04/2024	ANALYTICAL DATE	: 24, 25-29/04/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khotamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_April

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^u
				MW-34	MW-35	
pH	-	4500-H ⁺ B	< 0.10	7.59	7.74	"
Conductivity	µS/cm	2510 B	< 1.0	481	364	-
Salinity	ppt	2520 B	< 0.01	0.16	0.10	-
Arsenic (As)	mg/l	3114 C	< 0.0001	0.0029	0.0056	≤ 0.1
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	ND	≤ 2.0
Lead (Pb)	mg/l	3120 B	< 0.008	ND	ND	≤ 4.0
Mercury (Hg)	mg/l	3112 B	< 0.0001	ND	ND	≤ 0.7
Nickel (Ni)	mg/l	3120 B	< 0.002	ND	ND	≤ 5.0

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

Khemchuda Insorn

(Miss Khemchuda Insorn)

Analyst

REG. NO. 7-239-ก-0005

Mrs. Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-ก-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0793/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 24/04/2024	SAMPLING TIME	: 10:06-10:21, 09:31-09:46
RECEIVED DATE	: 25/04/2024	ANALYTICAL DATE	: 26/04/2024, 04-05/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khotamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_April

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^u
				MW-34	MW-35	
Naphthalene	mg/l	6440 C	< 0.0005	ND	ND	≤ 48
Benzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 0.2
Ethylbenzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 2.0
Toluene	mg/l	6200 B	< 0.0002	ND	ND	≤ 5.0
m-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
o-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
p-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
Total Xylenes	mg/l	6200 B	< 0.0006	ND	ND	≤ 24

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

Jutarat Jaemruen

(Miss Jutarat Jaemruen)

Analyst

REG. NO. 7-239-ก-0022

Mrs. Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-ก-0004

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GROUND WATER ANALYSIS REPORT

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SAMPLING DATE	: 24/04/2024	SAMPLING TIME	: 10:06-10:21, 09:31-09:46
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REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_April

PARAMETER	UNIT	ANALYSIS	ND	STATION		STANDARD ^{1/}
		METHODS	(non-detectable)	MW-34	MW-35	
Total Petroleum Hydrocarbons						
- TPH (C ₅ - C ₉)	mg/l	5030 C / 8260 D	< 0.003	ND	ND	≤ 1.4
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
- TPH (C ₉ - C ₁₆)	mg/l	3510 C / 8015 D	< 0.025	ND	ND	≤ 1.7
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
- TPH (C ₁₆ - C ₃₅)	mg/l	3510 C / 8015 D	< 0.050	ND	ND	≤ 0.1
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- n-Dotriacontane						
- n-Tetracontane						
- Pentatriacontane						

REFERENCE : US EPA SW 846 TEST METHODS FOR EVALUATING WATER AND SOLID WASTE, 3rd ED. 2016.

Sudaporn S.
(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-9-0001

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-9-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0793/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 24/04/2024	SAMPLING TIME	: 10:06-10:21, 09:31-09:46
RECEIVED DATE	: 25/04/2024	ANALYTICAL DATE	: 25/04/2024-09/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_April

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^u
				MW-34	MW-35	
alpha-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
gamma-BHC	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
Heptachlor	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.01
Aldrin	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.003
beta-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.03
delta-BHC	mg/l	6630 B	< 0.000003	ND	ND	-
Heptachlor epoxide	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
o,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endosulfan I	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
gamma-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
alpha-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
p,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Dieldrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.003
o,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 1.0
o,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
p,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endosulfan II	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
p,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endrin aldehyde	mg/l	6630 B	< 0.000001	ND	ND	-
Endosulfan Sulfate	mg/l	6630 B	< 0.000003	ND	ND	-
Endrin ketone	mg/l	6630 B	< 0.000003	ND	ND	-

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 22nd ED. 2017 (AWWA APHA WEF)

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-9-0001

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-9-0004

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

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3. ^u Notification of the Ministry of Industry, B.E.2559 (2016).

4. - Not available.



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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
TEL. (662) 959-3600 FAX (662) 959-3535 Website: secot.co.th E-mail: envserv@secot.co.th

GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0865/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 03/05/2024	SAMPLING TIME	: 10:32-10:48, 11:12-11:26
RECEIVED DATE	: 04/05/2024	ANALYTICAL DATE	: 03, 04-07/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_May

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^u
				MW-36	MW-37	
pH	-	4500-H ⁺ B	< 0.10	6.87	6.98	u
Conductivity	μS/cm	2510 B	< 1.0	2,040	2,933	-
Salinity	ppt	2520 B	< 0.01	0.81	1.2	-
Arsenic (As)	mg/l	3114 C	< 0.0001	0.0314	0.0567	≤ 0.1
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	ND	≤ 2.0
Lead (Pb)	mg/l	3120 B	< 0.008	ND	ND	≤ 4.0
Mercury (Hg)	mg/l	3112 B	< 0.0001	ND	ND	≤ 0.7
Nickel (Ni)	mg/l	3120 B	< 0.002	ND	ND	≤ 5.0

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

Khemchuda Insorn

(Miss Khemchuda Insorn)

Analyst

REG. NO. 2-239-n-0005

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 2-239-n-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0865/67
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REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_May

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^u
				MW-36	MW-37	
Naphthalene	mg/l	6440 C	< 0.00005	ND	ND	≤ 48
Benzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 0.2
Ethylbenzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 2.0
Toluene	mg/l	6200 B	< 0.0002	ND	ND	≤ 5.0
m-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
o-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
p-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
Total Xylenes	mg/l	6200 B	< 0.0006	ND	ND	≤ 24

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

Jutarat Jaemruen

(Miss Jutarat Jaemruen)

Analyst

REG. NO. 2-239-n-0022

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 2-239-n-0004

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GROUND WATER ANALYSIS REPORT

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SAMPLING DATE	: 03/05/2024	SAMPLING TIME	: 10:32-10:48, 11:12-11:26
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REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_May

PARAMETER	UNIT	ANALYSIS	ND	STATION		STANDARD ^U
		METHODS	(non-detectable)	MW-36	MW-37	
Total Petroleum Hydrocarbons						
- TPH (C ₅ - C ₉)	mg/l	5030 C / 8260 D	< 0.003	ND	ND	≤ 1.4
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
- TPH (C ₉₋₁₄ - C ₁₆)	mg/l	3510 C / 8015 D	< 0.025	ND	ND	≤ 1.7
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
- TPH (C ₁₄₋₁₆ - C ₃₂)	mg/l	3510 C / 8015 D	< 0.050	ND	ND	≤ 0.1
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- n-Dotriacontane						
- n-Tetracontane						
- Pentatriacontane						

REFERENCE : US EPA SW 846 TEST METHODS FOR EVALUATING WATER AND SOLID WASTE, 1st ED. 2002.

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-0-0001

MR

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-0-0004

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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
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GROUND WATER ANALYSIS REPORT

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REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_May

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^u
				MW-36	MW-37	
alpha-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
gamma-BHC	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
Heptachlor	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.01
Aldrin	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.003
beta-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.03
delta-BHC	mg/l	6630 B	< 0.000003	ND	ND	-
Heptachlor epoxide	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
o,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endosulfan I	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
gamma-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
alpha-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
p,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Dieldrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.003
o,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 1.0
o,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
p,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endosulfan II	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
p,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endrin aldehyde	mg/l	6630 B	< 0.000001	ND	ND	-
Endosulfan Sulfate	mg/l	6630 B	< 0.000003	ND	ND	-
Endrin ketone	mg/l	6630 B	< 0.000003	ND	ND	-

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

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-0-0001

MR

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-0-0004

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GROUND WATER ANALYSIS REPORT

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SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
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REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_May

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^u
				MW-38	MW-39	
pH	-	4500-H B	< 0.10	6.75	6.96	u
Conductivity	µS/cm	2510 B	< 1.0	2,338	4,024	-
Salinity	ppt	2520 B	< 0.01	0.93	1.7	-
Arsenic (As)	mg/l	3114 C	< 0.0001	0.0783	0.0152	≤ 0.1
Cadmium (Cd)	mg/l	3120 B	< 0.001	< 0.01	ND	≤ 2.0
Lead (Pb)	mg/l	3120 B	< 0.008	ND	ND	≤ 4.0
Mercury (Hg)	mg/l	3112 B	< 0.0001	ND	ND	≤ 0.7
Nickel (Ni)	mg/l	3120 B	< 0.002	< 0.01	ND	≤ 5.0

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

Khanchuda Insorn

(Miss Khanchuda Insorn)

Analyst

REG. NO. 7-239-n-0005

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-n-0004

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GROUND WATER ANALYSIS REPORT

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REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_May

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^u
				MW-38	MW-39	
Naphthalene	mg/l	6440 C	< 0.00005	ND	ND	≤ 48
Benzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 0.2
Ethylbenzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 2.0
Toluene	mg/l	6200 B	< 0.0002	ND	ND	≤ 5.0
m-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
o-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
p-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
Total Xylenes	mg/l	6200 B	< 0.0006	ND	ND	≤ 24

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

Jutarat Jaemruen

(Miss Jutarat Jaemruen)

Analyst

REG. NO. 7-239-n-0022

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-n-0004

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GROUND WATER ANALYSIS REPORT

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REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_May

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^{1/}
				MW-38	MW-39	
Total Petroleum Hydrocarbons						
- TPH (C ₃ - C ₆)	mg/l	5030 C / 8260 D	< 0.003	ND	ND	≤ 1.4
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
- TPH (C ₈ - C ₁₆)	mg/l	3510 C / 8015 D	< 0.025	ND	ND	≤ 1.7
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
- TPH (C ₁₆ - C ₃₂)	mg/l	3510 C / 8015 D	< 0.050	ND	ND	≤ 0.1
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- n-Dotriacontane						
- n-Tetracontane						
- Pentatriacontane						

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

Sudaporn S.
(Miss Sudaporn Soonthorn)
Analyst

REG. NO. 7-239-9-0001

(Mrs. Araya Tipparuk)
Technical Management Team
REG. NO. 7-239-9-0004

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GROUND WATER ANALYSIS REPORT

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REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_May

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^{1/}
				MW-38	MW-39	
alpha-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
gamma-BHC	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
Heptachlor	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.01
Aldrin	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.003
beta-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.03
delta-BHC	mg/l	6630 B	< 0.000003	ND	ND	-
Heptachlor epoxide	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
o,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endosulfan I	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
gamma-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
alpha-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
p,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Dieldrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.003
o,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 1.0
o,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
p,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endosulfan II	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
p,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endrin aldehyde	mg/l	6630 B	< 0.000001	ND	ND	-
Endosulfan Sulfate	mg/l	6630 B	< 0.000003	ND	ND	-
Endrin ketone	mg/l	6630 B	< 0.000003	ND	ND	-

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

Sudaporn S.
(Miss Sudaporn Soonthorn)
Analyst
REG. NO. 7-239-9-0001

(Mrs. Araya Tipparuk)
Technical Management Team
REG. NO. 7-239-9-0004

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

GROUND WATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical PCL, Branch 6 (Refinery) REQUEST SERVICE No. : 0865/67
SAMPLING BY : SECOT Co., Ltd. SAMPLING METHOD : Pneumatic Bladder Pump
SAMPLING DATE : 03/05/2024 SAMPLING TIME : 12:38-12:55
RECEIVED DATE : 04/05/2024 ANALYTICAL DATE : 03, 04-07/05/2024
REPORT DATE : 15/05/2024 SITE OPERATOR : Mr. Jeerawat Khotamhan
SAMPLE CONDITION : Normal FILE CODE : 224010_GW_May

PARAMETER	UNIT	ANALYSIS	ND	STATION		STANDARD ^{1/}
		METHODS	(non-detectable)	MW-40		
pH	-	4500-H ⁺ B	< 0.10	6.94		^{1/}
Conductivity	µS/cm	2510 B	< 1.0	1,374		-
Salinity	ppt	2520 B	< 0.01	0.51		-
Arsenic (As)	mg/l	3114 C	< 0.0001	0.0260		≤ 0.1
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND		≤ 2.0
Lead (Pb)	mg/l	3120 B	< 0.008	ND		≤ 4.0
Mercury (Hg)	mg/l	3112 B	< 0.0001	ND		≤ 0.7
Nickel (Ni)	mg/l	3120 B	< 0.002	ND		≤ 5.0

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

Khemchuda Insorn

(Miss Khemchuda Insorn)

Analyst

REG. NO. 7-239-ก-0005

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-ก-0004

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

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3. ¹⁾ Notification of the Ministry of Industry, B.E.2559 (2016).

4. - Not available.



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

GROUND WATER ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical PCL, Branch 6 (Refinery) REQUEST SERVICE No. : 0865/67
SAMPLING BY : SECOT Co., Ltd. SAMPLING METHOD : Pneumatic Bladder Pump
SAMPLING DATE : 03/05/2024 SAMPLING TIME : 12:38-12:55
RECEIVED DATE : 04/05/2024 ANALYTICAL DATE : 04-10/05/2024
REPORT DATE : 15/05/2024 SITE OPERATOR : Mr. Jeerawat Khotamhan
SAMPLE CONDITION : Normal FILE CODE : 224010_GW_May

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION	STANDARD ¹⁾
				MW-40	
Naphthalene	mg/l	6440 C	< 0.00005	ND	≤ 48
Benzene	mg/l	6200 B	< 0.0002	ND	≤ 0.2
Ethylbenzene	mg/l	6200 B	< 0.0002	ND	≤ 2.0
Toluene	mg/l	6200 B	< 0.0002	ND	≤ 5.0
m-Xylene	mg/l	6200 B	< 0.0002	ND	≤ 24
o-Xylene	mg/l	6200 B	< 0.0002	ND	≤ 24
p-Xylene	mg/l	6200 B	< 0.0002	ND	≤ 24
Total Xylenes	mg/l	6200 B	< 0.0006	ND	≤ 24

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

Jutarat Jaemruen

(Miss Jutarat Jaemruen)

Analyst

REG. NO. 7-239-ก-0022

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-ก-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL., Branch 6 (Refinery)	REQUEST SERVICE No	: 0865/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 03/05/2024	SAMPLING TIME	: 12:38-12:55
RECEIVED DATE	: 04/05/2024	ANALYTICAL DATE	: 07-14/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_May

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION MW-40	STANDARD ^U
Total Petroleum Hydrocarbons					
- TPH (C ₅ -C ₉)	mg/l	5030 C / 8260 D	< 0.003	ND	≤ 1.4
- Pentane					
- Benzene					
- Toluene					
- m,p-Xylene					
- o-Xylene					
- Ethylbenzene					
- TPH (C ₁₀ -C ₁₆)	mg/l	3510 C / 8015 D	< 0.025	ND	≤ 1.7
- n-Nonane					
- n-Decane					
- n-Dodecane					
- n-Tetradecane					
- n-Hexadecane					
- TPH (C ₁₈ -C ₃₅)	mg/l	3510 C / 8015 D	< 0.050	ND	≤ 0.1
- n-Octadecane					
- n-Eicosane					
- n-Docosane					
- n-Tetracosane					
- n-Hexacosane					
- n-Octacosane					
- n-Triacontane					
- n-Dotriacontane					
- n-Tetracontane					
- Pentatriacontane					

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

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-0-0001

Araya T

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-0-0004

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

GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL., Branch 6 (Refinery)	REQUEST SERVICE No	: 0865/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 03/05/2024	SAMPLING TIME	: 12:38-12:55
RECEIVED DATE	: 04/05/2024	ANALYTICAL DATE	: 07-10/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_May

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION MW-40	STANDARD ^U
alpha-BHC	mg/l	6630 B	< 0.000001	ND	≤ 0.01
gamma-BHC	mg/l	6630 B	< 0.000003	ND	≤ 0.04
Heptachlor	mg/l	6630 B	< 0.000003	ND	≤ 0.01
Aldrin	mg/l	6630 B	< 0.000001	ND	≤ 0.003
beta-BHC	mg/l	6630 B	< 0.000001	ND	≤ 0.03
delta-BHC	mg/l	6630 B	< 0.000003	ND	-
Heptachlor epoxide	mg/l	6630 B	< 0.000001	ND	≤ 0.01
o,p'-DDE	mg/l	6630 B	< 0.000003	ND	≤ 0.1
Endosulfan I	mg/l	6630 B	< 0.000003	ND	≤ 14
gamma-Chlordane	mg/l	6630 B	< 0.000003	ND	≤ 0.04
alpha-Chlordane	mg/l	6630 B	< 0.000003	ND	≤ 0.04
p,p'-DDE	mg/l	6630 B	< 0.000003	ND	≤ 0.1
Dieldrin	mg/l	6630 B	< 0.000003	ND	≤ 0.003
o,p'-DDD	mg/l	6630 B	< 0.000003	ND	≤ 0.2
Endrin	mg/l	6630 B	< 0.000003	ND	≤ 1.0
o,p'-DDT	mg/l	6630 B	< 0.000003	ND	≤ 0.1
p,p'-DDD	mg/l	6630 B	< 0.000003	ND	≤ 0.2
Endosulfan II	mg/l	6630 B	< 0.000003	ND	≤ 14
p,p'-DDT	mg/l	6630 B	< 0.000003	ND	≤ 0.1
Endrin aldehyde	mg/l	6630 B	< 0.000001	ND	-
Endosulfan Sulfate	mg/l	6630 B	< 0.000003	ND	-
Endrin ketone	mg/l	6630 B	< 0.000003	ND	-

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

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-0-0001

Araya T

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-0-0004

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

GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0883/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 06/05/2024	SAMPLING TIME	: 10:58-11:27, 10:16-10:33
RECEIVED DATE	: 07/05/2024	ANALYTICAL DATE	: 06, 07-10/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_May

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^u
				MW-41	MW-42	
pH	-	4500-H ⁺ B	< 0.10	7.18	7.46	u
Conductivity	µS/cm	2510 B	< 1.0	6,392	36,730	-
Salinity	ppt	2520 B	< 0.01	4.2	29.2	-
Arsenic (As)	mg/l	3114 C	< 0.0001	0.0241	0.0139	≤ 0.1
Cadmium (Cd)	mg/l	3120 B	< 0.001	ND	ND	≤ 2.0
Lead (Pb)	mg/l	3120 B	< 0.008	ND	ND	≤ 4.0
Mercury (Hg)	mg/l	3112 B	< 0.0001	ND	ND	≤ 0.7
Nickel (Ni)	mg/l	3120 B	< 0.002	ND	ND	≤ 5.0

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

Khemchuda Insorn

(Miss Khemchuda Insorn)

Analyst

REG. NO. 7-239-ก-0005

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-ก-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0883/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 06/05/2024	SAMPLING TIME	: 10:58-11:27, 10:16-10:33
RECEIVED DATE	: 07/05/2024	ANALYTICAL DATE	: 09-13/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_May

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^u
				MW-41	MW-42	
Naphthalene	mg/l	6440 C	< 0.00005	ND	ND	≤ 48
Benzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 0.2
Ethylbenzene	mg/l	6200 B	< 0.0002	ND	ND	≤ 2.0
Toluene	mg/l	6200 B	< 0.0002	ND	ND	≤ 5.0
m-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
o-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
p-Xylene	mg/l	6200 B	< 0.0002	ND	ND	≤ 24
Total Xylenes	mg/l	6200 B	< 0.0006	ND	ND	≤ 24

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

Jutarat Jaemruen

(Miss Jutarat Jaemruen)

Analyst

REG. NO. 7-239-ก-0022

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-ก-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0883/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 06/05/2024	SAMPLING TIME	: 10:58-11:27, 10:16-10:33
RECEIVED DATE	: 07/05/2024	ANALYTICAL DATE	: 09-14/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_May

PARAMETER	UNIT	ANALYSIS	ND	STATION		STANDARD ^u
		METHODS	(non-detectable)	MW-41	MW-42	
Total Petroleum Hydrocarbons						
- TPH (C ₃ - C ₉)	mg/l	5030 C / 8260 D	< 0.003	ND	ND	≤ 1.4
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
- TPH (C ₁₀ - C ₁₆)	mg/l	3510 C / 8015 D	< 0.025	ND	ND	≤ 1.7
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
- TPH (C ₁₈ - C ₂₅)	mg/l	3510 C / 8015 D	< 0.050	ND	ND	≤ 0.1
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- n-Dotriacontane						
- n-Tetatriacontane						
- Pentatriacontane						

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

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-0-0001

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-0-0004

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GROUND WATER ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No	: 0883/67
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Pneumatic Bladder Pump
SAMPLING DATE	: 06/05/2024	SAMPLING TIME	: 10:58-11:27, 10:16-10:33
RECEIVED DATE	: 07/05/2024	ANALYTICAL DATE	: 08-09/05/2024
REPORT DATE	: 15/05/2024	SITE OPERATOR	: Mr. Jeerawat Khothamhan
SAMPLE CONDITION	: Normal	FILE CODE	: 224010_GW_May

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^u
				MW-41	MW-42	
alpha-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
gamma-BHC	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
Heptachlor	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.01
Aldrin	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.003
beta-BHC	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.03
delta-BHC	mg/l	6630 B	< 0.000003	ND	ND	-
Heptachlor epoxide	mg/l	6630 B	< 0.000001	ND	ND	≤ 0.01
o,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endosulfan I	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
gamma-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
alpha-Chlordane	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.04
p,p'-DDE	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Dieldrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.003
o,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endrin	mg/l	6630 B	< 0.000003	ND	ND	≤ 1.0
o,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
p,p'-DDD	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.2
Endosulfan II	mg/l	6630 B	< 0.000003	ND	ND	≤ 14
p,p'-DDT	mg/l	6630 B	< 0.000003	ND	ND	≤ 0.1
Endrin aldehyde	mg/l	6630 B	< 0.000001	ND	ND	-
Endosulfan Sulfate	mg/l	6630 B	< 0.000003	ND	ND	-
Endrin ketone	mg/l	6630 B	< 0.000003	ND	ND	-

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER, 19th ED., 2017 (AWWA, APHA, WEF)

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-0-0001

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-0-0004

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

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3. ^u Notification of the Ministry of Industry, B.E.2559 (2016).

4. - Not available.

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

SOIL SAMPLES ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical PCL, Branch 6 (Refinery) REQUEST SERVICE No. : 0663/66
SAMPLING BY : SECOT Co., Ltd. SAMPLING METHOD : Hand Auger
SAMPLING DATE : 28/04/2023 SAMPLING TIME : 11:30-11:50
RECEIVED DATE : 02/05/2023 ANALYTICAL DATE : 02-05/05/2023
REPORT DATE : 15/05/2023 SITE OPERATOR : Mr. Aniwat Pimwanna
SAMPLE CONDITION : Normal FILE CODE : 223010_Soil_May

PARAMETER	UNIT	ANALYSIS	ND	STATION		STANDARD (1)
		METHODS	(non-detectable)	MW 1		
pH	-	4500-H B	-	8.93		-
Conductivity	dS/m	EC25 (1:5) / Electrical Conductivity	-	0.075		-
Salinity	ppt	EC25 (1:5) / Electrical Conductivity	-	0.0		-
Arsenic (As)	mg/kg	3050 B/6010 D	< 2.00	11.84		≤ 27
Cadmium (Cd)	mg/kg	3050 B/6010 D	< 1.00	ND		≤ 810
Lead (Pb)	mg/kg	3050 B/6010 D	< 3.00	19.23		≤ 750
Mercury (Hg)	mg/kg	7471B	< 0.05	ND		≤ 610
Nickel (Ni)	mg/kg	3050 B/6010 D	< 1.00	7.40		≤ 41,000

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

(Miss Khemchuda Insorn)

Analyst

REG. NO. 7-239-n-5976

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-n-5863

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

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3. ^{1/} Notification of the Ministry of Industry, B.E.2559 (2016).

4. Reference method : Operation Manual Chemical Analysis in Soil, Land Development Department.

5. - Not available.



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SECOT CO., LTD.

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SOIL SAMPLES ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical PCL, Branch 6 (Refinery) REQUEST SERVICE No. : 0663/66
SAMPLING BY : SECOT Co., Ltd. SAMPLING METHOD : Hand Auger
SAMPLING DATE : 28/04/2023 SAMPLING TIME : 11:30-11:50
RECEIVED DATE : 02/05/2023 ANALYTICAL DATE : 03-06, 08/05/2023
REPORT DATE : 15/05/2023 SITE OPERATOR : Mr. Aniwat Pimwanna
SAMPLE CONDITION : Normal FILE CODE : 223010_Soil_May

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION	STANDARD ¹
				MW 1	
Naphthalene	mg/kg	3540 C / 8270 E	< 0.005	ND	≤ 1,000
Benzene	mg/kg	5035 A / 8260 D	< 0.00025	ND	≤ 15
Ethylbenzene	mg/kg	5035 A / 8260 D	< 0.00025	ND	≤ 230
Toluene	mg/kg	5035 A / 8260 D	< 0.00025	ND	≤ 520
m-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	≤ 210
o-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	≤ 210
p-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	≤ 210
Total Xylenes	mg/kg	5035 A / 8260 D	< 0.00075	ND	≤ 210

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

(Miss Jutarat Jaemruen)

Analyst

REG. NO. 7-239-n-5827

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-n-5863

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

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3. ^{1/} Notification of the Ministry of Industry, B.E.2559 (2016).



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

SOIL SAMPLES ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical PCL, Branch 6 (Refinery) REQUEST SERVICE No. : 0663/66
SAMPLING BY : SECOT Co., Ltd. SAMPLING METHOD : Hand Auger
SAMPLING DATE : 28/04/2023 SAMPLING TIME : 11:30-11:50
RECEIVED DATE : 02/05/2023 ANALYTICAL DATE : 05, 09-11/05/2023
REPORT DATE : 15/05/2023 SITE OPERATOR : Mr. Aniwat Pimwanna
SAMPLE CONDITION : Normal FILE CODE : 223010_Soil_May

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION MW 1	STANDARD ¹⁷
Total Petroleum Hydrocarbon					
- TPH (C ₅ -C ₁₀)	mg/kg	5035 A / 8260 D	< 0.003	ND	≤ 25
- Pentane					
- Benzene					
- Toluene					
- m,p-Xylene					
- o-Xylene					
- Ethylbenzene					
- TPH (C ₉ -C ₁₆)	mg/kg	3540 C / 8015 D	< 0.25	ND	≤ 25
- n-Nonane					
- n-Decane					
- n-Dodecane					
- n-Tetradecane					
- n-Hexadecane					
- TPH (C ₁₄ -C ₃₅)	mg/kg	3540 C / 8015 D	< 1.85	ND	≤ 8
- n-Octadecane					
- n-Eicosane					
- n-Docosane					
- n-Tetracosane					
- n-Hexacosane					
- n-Octacosane					
- n-Triacontane					
- n-Dotriacontane					
- n-Tetracontane					
- Pentatriacontane					

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

Sudaporn Soonthorn

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 2-239-8-0001

AR

(Mrs. Araya Tipparak)

Technical Management Team

REG. NO. 2-239-8-5863

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

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3. ¹⁷ Notification of the Ministry of Industry, B.E.2559 (2016).



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SOIL SAMPLES ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical PCL, Branch 6 (Refinery) REQUEST SERVICE No. : 0663/66
SAMPLING BY : SECOT Co., Ltd. SAMPLING METHOD : Hand Auger
SAMPLING DATE : 28/04/2023 SAMPLING TIME : 11:30-11:50
RECEIVED DATE : 02/05/2023 ANALYTICAL DATE : 08-09/05/2023
REPORT DATE : 15/05/2023 SITE OPERATOR : Mr. Aniwat Pimwanna
SAMPLE CONDITION : Normal FILE CODE : 223010_Soil_May

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION MW 1	STANDARD ¹⁷
alpha-BHC	mg/kg	3550 C / 8081 B	< 0.0002	ND	≤ 0.3
gamma-BHC	mg/kg	3550 C / 8081 B	< 0.0002	ND	≤ 29
Heptachlor	mg/kg	3550 C / 8081 B	< 0.0002	ND	≤ 5.5
Aldrin	mg/kg	3550 C / 8081 B	< 0.0002	ND	≤ 0.1
beta-BHC	mg/kg	3550 C / 8081 B	< 0.0002	ND	≤ 0.9
delta-BHC	mg/kg	3550 C / 8081 B	< 0.0002	ND	-
Heptachlor epoxide	mg/kg	3550 C / 8081 B	< 0.0002	ND	≤ 2.7
o,p'-DDE	mg/kg	3550 C / 8081 B	< 0.0002	ND	≤ 0.001
Endosulfan I	mg/kg	3550 C / 8081 B	< 0.0002	ND	-
gamma-Chlordane	mg/kg	3550 C / 8081 B	< 0.0002	ND	≤ 110
alpha-Chlordane	mg/kg	3550 C / 8081 B	< 0.0002	ND	≤ 110
p,p'-DDE	mg/kg	3550 C / 8081 B	< 0.0002	ND	≤ 0.001
Dieldrin	mg/kg	3550 C / 8081 B	< 0.0002	ND	≤ 1.5
o,p'-DDD	mg/kg	3550 C / 8081 B	< 0.0002	ND	≤ 7
Endrin	mg/kg	3550 C / 8081 B	< 0.0002	ND	≤ 25
o,p'-DDT	mg/kg	3550 C / 8081 B	< 0.0002	ND	≤ 120
p,p'-DDD	mg/kg	3550 C / 8081 B	< 0.0002	ND	≤ 7
Endosulfan II	mg/kg	3550 C / 8081 B	< 0.0002	ND	-
p,p'-DDT	mg/kg	3550 C / 8081 B	< 0.0002	ND	≤ 120
Endrin aldehyde	mg/kg	3550 C / 8081 B	< 0.0002	ND	-
Endosulfan sulfate	mg/kg	3550 C / 8081 B	< 0.0002	ND	-
Endrin ketone	mg/kg	3550 C / 8081 B	< 0.0002	ND	-

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

Sudaporn Soonthorn

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 2-239-8-0001

AR

(Mrs. Araya Tipparak)

Technical Management Team

REG. NO. 2-239-8-5863

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3. ¹⁷ Notification of the Ministry of Industry, B.E.2559 (2016).

4. - Not available.



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

SOIL SAMPLES ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical PCL, Branch 6 (Refinery) REQUEST SERVICE No. : 0676/66
SAMPLING BY : SECOT Co., Ltd. SAMPLING METHOD : Hand Auger
SAMPLING DATE : 03/05/2023 SAMPLING TIME : 15:35-15:50
RECEIVED DATE : 04/05/2023 ANALYTICAL DATE : 04-05/05/2023
REPORT DATE : 15/05/2023 SITE OPERATOR : Mr. Aniwat Pimwanna
SAMPLE CONDITION : Normal FILE CODE : 223010_Soil_May

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION	STANDARD ^U
				MW 3	
pH	-	4500-H B	-	8.28	-
Conductivity	dS/m	EC25 (1:5) / Electrical Conductivity	-	0.038	-
Salinity	ppt	EC25 (1:5) / Electrical Conductivity	-	0.0	-
Arsenic (As)	mg/kg	3050 B/6010 D	< 2.00	ND	≤ 27
Cadmium (Cd)	mg/kg	3050 B/6010 D	< 1.00	ND	≤ 810
Lead (Pb)	mg/kg	3050 B/6010 D	< 3.00	7.38	≤ 750
Mercury (Hg)	mg/kg	7471 B	< 0.05	ND	≤ 610
Nickel (Ni)	mg/kg	3050 B/6010 D	< 1.00	2.46	≤ 41,000

REFERENCE : US EPA SW 846 TEST METHODS FOR EVALUATING WATER AND SOLID WASTE, 8th ED., 2020

Khemchuda Insorn

(Miss Khemchuda Insorn)

Analyst

REG. NO. 9-239-n-5976

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 9-239-n-5863

- 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 Industry, B.E.2559 (2016).
4. Reference method : Operation Manual Chemical Analysis in Soil, Land Development Department.
5. - Not available.



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SOIL SAMPLES ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical PCL, Branch 6 (Refinery) REQUEST SERVICE No. : 0676/66
SAMPLING BY : SECOT Co., Ltd. SAMPLING METHOD : Hand Auger
SAMPLING DATE : 03/05/2023 SAMPLING TIME : 15:35-15:50
RECEIVED DATE : 04/05/2023 ANALYTICAL DATE : 05-06, 08/05/2023
REPORT DATE : 15/05/2023 SITE OPERATOR : Mr. Aniwat Pimwanna
SAMPLE CONDITION : Normal FILE CODE : 223010_Soil_May

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION	STANDARD ^U
				MW 3	
Naphthalene	mg/kg	3540 C / 8270 E	< 0.005	ND	≤ 1,000
Benzene	mg/kg	5035 A / 8260 D	< 0.00025	ND	≤ 15
Ethylbenzene	mg/kg	5035 A / 8260 D	< 0.00025	ND	≤ 230
Toluene	mg/kg	5035 A / 8260 D	< 0.00025	ND	≤ 520
m-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	≤ 210
o-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	≤ 210
p-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	≤ 210
Total Xylenes	mg/kg	5035 A / 8260 D	< 0.00075	ND	≤ 210

REFERENCE : US EPA SW 846 TEST METHODS FOR EVALUATING WATER AND SOLID WASTE, 8th ED., 2020

Jutarat Jaemruen

(Miss Jutarat Jaemruen)

Analyst

REG. NO. 9-239-n-5827

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 9-239-n-5863

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SOIL SAMPLES ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical PCL, Branch 6 (Refinery) REQUEST SERVICE No. : 0676/66
SAMPLING BY : SECOT Co., Ltd. SAMPLING METHOD : Hand Auger
SAMPLING DATE : 03/05/2023 SAMPLING TIME : 15:35-15:50
RECEIVED DATE : 04/05/2023 ANALYTICAL DATE : 05.09-11/05/2023
REPORT DATE : 15/05/2023 SITE OPERATOR : Mr. Aniwat Pimwanna
SAMPLE CONDITION : Normal FILE CODE : 223010_Soil_May

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION MW 3	STANDARD ¹⁾
Total Petroleum Hydrocarbon					
- TPH (C ₅ - C ₈)	mg/kg	5035 A / 8260 D	< 0.003	ND	≤ 25
- Pentane					
- Benzene					
- Toluene					
- m,p-Xylene					
- o-Xylene					
- Ethylbenzene					
- TPH (C ₉ - C ₁₆)	mg/kg	3540 C / 8015 D	< 0.25	ND	≤ 25
- n-Nonane					
- n-Decane					
- n-Dodecane					
- n-Tetradecane					
- n-Hexadecane					
- TPH (C ₁₇ - C ₃₅)	mg/kg	3540 C / 8015 D	< 1.85	6.56	≤ 8
- n-Octadecane					
- n-Eicosane					
- n-Docosane					
- n-Tetracosane					
- n-Hexacosane					
- n-Octacosane					
- n-Triacontane					
- n-Dotriacontane					
- n-Tetracontane					
- Pentatriacontane					

REFERENCE : U.S EPA SW 846 TEST METHODS FOR EVALUATING WATER AND SOLID WASTE, 3rd ED., 2000

Sudaporn Soonthorn
(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-8-0001

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-8-5863

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 3. ¹⁾ Notification of the Ministry of Industry, B.E.2559 (2016).



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SOIL SAMPLES ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical PCL, Branch 6 (Refinery) REQUEST SERVICE No. : 0676/66
SAMPLING BY : SECOT Co., Ltd. SAMPLING METHOD : Hand Auger
SAMPLING DATE : 03/05/2023 SAMPLING TIME : 15:35-15:50
RECEIVED DATE : 04/05/2023 ANALYTICAL DATE : 08-09/05/2023
REPORT DATE : 15/05/2023 SITE OPERATOR : Mr. Aniwat Pimwanna
SAMPLE CONDITION : Normal FILE CODE : 223010_Soil_May

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION MW 3	STANDARD ¹⁾
alpha-BHC	mg/kg	3550 C / 8081 B	< 0.0002	ND	≤ 0.3
gamma-BHC	mg/kg	3550 C / 8081 B	< 0.0002	ND	≤ 29
Heptachlor	mg/kg	3550 C / 8081 B	< 0.0002	ND	≤ 5.5
Aldrin	mg/kg	3550 C / 8081 B	< 0.0002	ND	≤ 0.1
beta-BHC	mg/kg	3550 C / 8081 B	< 0.0002	ND	≤ 0.9
delta-BHC	mg/kg	3550 C / 8081 B	< 0.0002	ND	-
Heptachlor epoxide	mg/kg	3550 C / 8081 B	< 0.0002	ND	≤ 2.7
o,p'-DDE	mg/kg	3550 C / 8081 B	< 0.0002	ND	≤ 0.001
Endosulfan I	mg/kg	3550 C / 8081 B	< 0.0002	ND	-
gamma-Chlordane	mg/kg	3550 C / 8081 B	< 0.0002	ND	≤ 110
alpha-Chlordane	mg/kg	3550 C / 8081 B	< 0.0002	ND	≤ 110
p,p'-DDE	mg/kg	3550 C / 8081 B	< 0.0002	ND	≤ 0.001
Dieldrin	mg/kg	3550 C / 8081 B	< 0.0002	ND	≤ 1.5
o,p'-DDD	mg/kg	3550 C / 8081 B	< 0.0002	ND	≤ 7
Endrin	mg/kg	3550 C / 8081 B	< 0.0002	ND	≤ 25
o,p'-DDT	mg/kg	3550 C / 8081 B	< 0.0002	ND	≤ 120
p,p'-DDD	mg/kg	3550 C / 8081 B	< 0.0002	ND	≤ 7
Endosulfan II	mg/kg	3550 C / 8081 B	< 0.0002	ND	-
p,p'-DDT	mg/kg	3550 C / 8081 B	< 0.0002	ND	≤ 120
Endrin aldehyde	mg/kg	3550 C / 8081 B	< 0.0002	ND	-
Endosulfan sulfate	mg/kg	3550 C / 8081 B	< 0.0002	ND	-
Endrin ketone	mg/kg	3550 C / 8081 B	< 0.0002	ND	-

REFERENCE : U.S EPA SW 846 TEST METHODS FOR EVALUATING WATER AND SOLID WASTE, 3rd ED., 2000

Sudaporn Soonthorn
(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-8-0001

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-8-5863

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 4. - Not available.



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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
TEL. (662) 959-3600 FAX (662) 959-3535 Website : secot.co.th E-mail : envserv@secot.co.th

SOIL SAMPLES ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical PCL, Branch 6 (Refinery) REQUEST SERVICE No. : 0645/66
SAMPLING BY : SECOT Co., Ltd. SAMPLING METHOD : Hand Auger
SAMPLING DATE : 26-27/04/2023 SAMPLING TIME : 11:37-11:50, 14:55-15:25
RECEIVED DATE : 28/04/2023 ANALYTICAL DATE : 28/04/2023-05/05/2023
REPORT DATE : 15/05/2023 SITE OPERATOR : Mr. Aniwat Pimwanna
SAMPLE CONDITION : Normal FILE CODE : 223010_Soil_April

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ¹⁾
				MW 9	MW 32	
pH	-	4500-H B	-	7.77	8.44	-
Conductivity	dS/m	EC25 (1:5) / Electrical Conductivity	-	0.022	0.024	-
Salinity	ppt	EC25 (1:5) / Electrical Conductivity	-	0.0	0.0	-
Arsenic (As)	mg/kg	3050 B/6010 D	< 2.00	19.87	ND	≤ 27
Cadmium (Cd)	mg/kg	3050 B/6010 D	< 1.00	ND	ND	≤ 810
Lead (Pb)	mg/kg	3050 B/6010 D	< 3.00	7.20	4.30	≤ 750
Mercury (Hg)	mg/kg	7471 B	< 0.05	0.16	0.23	≤ 610
Nickel (Ni)	mg/kg	3050 B/6010 D	< 1.00	5.48	1.55	≤ 41,000

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

Khemchuda Insorn

(Miss Khemchuda Insorn)

Analyst

REG. NO. 2-239-n-5976

(Mrs. Araya Tippiarak)

(Mrs. Araya Tippiarak)

Technical Management Team

REG. NO. 2-239-n-5863

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

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3. ¹⁾ Notification of the Ministry of Industry, B.E.2559 (2016).

4. Reference method : Operation Manual Chemical Analysis in Soil, Land Development Department.

5. - Not available.



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SOIL SAMPLES ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical PCL, Branch 6 (Refinery) REQUEST SERVICE No. : 0645/66
SAMPLING BY : SECOT Co., Ltd. SAMPLING METHOD : Hand Auger
SAMPLING DATE : 26-27/04/2023 SAMPLING TIME : 11:37-11:50, 14:55-15:25
RECEIVED DATE : 28/04/2023 ANALYTICAL DATE : 03-06, 08/05/2023
REPORT DATE : 15/05/2023 SITE OPERATOR : Mr. Aniwat Pimwanna
SAMPLE CONDITION : Normal FILE CODE : 223010_Soil_April

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ¹⁾
				MW 9	MW 32	
Naphthalene	mg/kg	3540 C / 8270 E	< 0.005	ND	ND	≤ 1,000
Benzene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 15
Ethylbenzene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 230
Toluene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 520
m-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 210
o-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 210
p-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 210
Total Xylenes	mg/kg	5035 A / 8260 D	< 0.00075	ND	ND	≤ 210

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

Jutarat Jaemruen

(Miss Jutarat Jaemruen)

Analyst

REG. NO. 2-239-n-5827

(Mrs. Araya Tippiarak)

(Mrs. Araya Tippiarak)

Technical Management Team

REG. NO. 2-239-n-5863

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3. ¹⁾ Notification of the Ministry of Industry, B.E.2559 (2016).

4. - Not available.



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SOIL SAMPLES ANALYSIS REPORT

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SAMPLING DATE : 26-27/04/2023 SAMPLING TIME : 11:37-11:50, 14:55-15:25
RECEIVED DATE : 28/04/2023 ANALYTICAL DATE : 05, 09-11/05/2023
REPORT DATE : 15/05/2023 SITE OPERATOR : Mr. Aniwat Pimwanna
SAMPLE CONDITION : Normal FILE CODE : 223010_Soil_April

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^U
				MW 9	MW 32	
Total Petroleum Hydrocarbon						
- TPH (C ₉ - C ₁₆)	mg/kg	5035 A / 8260 D	< 0.003	ND	ND	≤ 25
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
- TPH (C ₉₋₁₆ - C ₁₆)	mg/kg	3540 C / 8015 D	< 0.25	ND	0.69	≤ 25
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
- TPH (C ₉₋₁₆ - C ₂₅)	mg/kg	3540 C / 8015 D	< 1.85	ND	ND	≤ 8
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- n-Dotriacontane						
- n-Tetraatriacontane						
- Pentatriacontane						

REFERENCE : US EPA SW 846 TEST METHODS FOR EVALUATING WATER AND SOLID WASTE, 3rd ED., 2000

Sudaporn Soonthorn
(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-0-0001

(Mrs. Araya Tipparak)

Technical Management Team

REG. NO. 7-239-0-5863

- Remark : 1. Reported analysis refers to submitted sample only.
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3. ^U Notification of the Ministry of Industry, B.E.2559 (2016).



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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
TEL. (662) 959-3600 FAX (662) 959-3535 Website: secot.co.th E-mail: envserv@secot.co.th

SOIL SAMPLES ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical PCL, Branch 6 (Refinery) REQUEST SERVICE No. : 0645/66
SAMPLING BY : SECOT Co., Ltd. SAMPLING METHOD : Hand Auger
SAMPLING DATE : 26-27/04/2023 SAMPLING TIME : 11:37-11:50, 14:55-15:25
RECEIVED DATE : 28/04/2023 ANALYTICAL DATE : 08-09/05/2023
REPORT DATE : 15/05/2023 SITE OPERATOR : Mr. Aniwat Pimwanna
SAMPLE CONDITION : Normal FILE CODE : 223010_Soil_April

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^U
				MW 9	MW 32	
alpha-BHC	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 0.3
gamma-BHC	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 29
Heptachlor	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 5.5
Aldrin	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 0.1
beta-BHC	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 0.9
delta-BHC	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	-
Heptachlor epoxide	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 2.7
o,p'-DDE	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 0.001
Endosulfan I	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	-
gamma-Chlordane	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 110
alpha-Chlordane	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 110
p,p'-DDE	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 0.001
Dieldrin	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 1.5
o,p'-DDD	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 7
Endrin	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 25
o,p'-DDT	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 120
p,p'-DDD	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 7
Endosulfan II	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	-
p,p'-DDT	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 120
Endrin aldehyde	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	-
Endosulfan sulfate	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	-
Endrin ketone	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	-

REFERENCE : US EPA SW 846 TEST METHODS FOR EVALUATING WATER AND SOLID WASTE, 3rd ED., 2000

Sudaporn Soonthorn
(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-0-0001

(Mrs. Araya Tipparak)

Technical Management Team

REG. NO. 7-239-0-5863

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4. - Not available.



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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
TEL. (662) 959-3600 FAX (662) 959-3535 Website : secot.co.th E-mail : envserv@secot.co.th

SOIL SAMPLES ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical PCL, Branch 6 (Refinery) REQUEST SERVICE No. : 0663/66
SAMPLING BY : SECOT Co., Ltd. SAMPLING METHOD : Hand Auger
SAMPLING DATE : 28/04/2023 SAMPLING TIME : 14:50-15:15, 15:25-15:45
RECEIVED DATE : 02/05/2023 ANALYTICAL DATE : 02-05/05/2023
REPORT DATE : 15/05/2023 SITE OPERATOR : Mr. Aniwat Pimwanna
SAMPLE CONDITION : Normal FILE CODE : 223010_Soil_May

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ¹⁾
				MW 23	MW 24	
pH	-	4500-H ² B	-	7.43	8.55	-
Conductivity	dS/m	EC25 (1:5) / Electrical Conductivity	-	0.019	0.040	-
Salinity	ppt	EC25 (1:5) / Electrical Conductivity	-	0.0	0.0	-
Arsenic (As)	mg/kg	3050 B/6010 D	< 2.00	3.41	9.99	≤ 27
Cadmium (Cd)	mg/kg	3050 B/6010 D	< 1.00	ND	ND	≤ 810
Lead (Pb)	mg/kg	3050 B/6010 D	< 3.00	9.69	9.03	≤ 750
Mercury (Hg)	mg/kg	7471B	< 0.05	0.12	0.12	≤ 610
Nickel (Ni)	mg/kg	3050 B/6010 D	< 1.00	14.95	4.51	≤ 41,000

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

Khemchuda Insorn

(Miss Khemchuda Insorn)

Analyst

REG. NO. 7-239-ก-5976

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-ก-5863

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 3. ¹⁾ Notification of the Ministry of Industry, B.E.2559 (2016).
 4. Reference method : Operation Manual Chemical Analysis in Soil, Land Development Department.
 5. - Not available.



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SOIL SAMPLES ANALYSIS REPORT

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SAMPLING BY : SECOT Co., Ltd. SAMPLING METHOD : Hand Auger
SAMPLING DATE : 28/04/2023 SAMPLING TIME : 14:50-15:15, 15:25-15:45
RECEIVED DATE : 02/05/2023 ANALYTICAL DATE : 03-06, 08/05/2023
REPORT DATE : 15/05/2023 SITE OPERATOR : Mr. Aniwat Pimwanna
SAMPLE CONDITION : Normal FILE CODE : 223010_Soil_May

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ¹⁾
				MW 23	MW 24	
Naphthalene	mg/kg	3540 C / 8270 E	< 0.005	ND	ND	≤ 1,000
Benzene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 15
Ethylbenzene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 230
Toluene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 520
m-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 210
o-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 210
p-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 210
Total Xylenes	mg/kg	5035 A / 8260 D	< 0.00075	ND	ND	≤ 210

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

Jutarat Jaemruen

(Miss Jutarat Jaemruen)

Analyst

REG. NO. 7-239-ก-5827

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-ก-5863

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SOIL SAMPLES ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0663/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Hand Auger
SAMPLING DATE	: 28/04/2023	SAMPLING TIME	: 14:50-15:15, 15:25-15:45
RECEIVED DATE	: 02/05/2023	ANALYTICAL DATE	: 05, 09-11/05/2023
REPORT DATE	: Normal	SITE OPERATOR	: Mr. Aniwat Pimwanna
SAMPLE CONDITION	: Normal	FILE CODE	: 223010_Soil_May

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^{1/}
				MW 23	MW 24	
Total Petroleum Hydrocarbon						
- TPH (C ₈ - C ₁₆)	mg/kg	5035 A / 8260 D	< 0.003	ND	ND	≤ 25
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
- TPH (C ₁₈ - C ₃₅)	mg/kg	3540 C / 8015 D	< 0.25	ND	0.90	≤ 25
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
- TPH (C ₁₆ - C ₃₅)	mg/kg	3540 C / 8015 D	< 1.85	3.85	ND	≤ 8
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- n-Dotriacontane						
- n-Tetratriacontane						
- Pentatriacontane						

REFERENCE: U.S. EPA SW-846 TEST METHODS FOR EVALUATING WATER AND SOLID WASTE, 3rd ED., 2020

Sudaporn Soonthorn

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-9-0001

Araya Tipparak

(Mrs. Araya Tipparak)

Technical Management Team

REG. NO. 7-239-9-5863

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SOIL SAMPLES ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0663/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Hand Auger
SAMPLING DATE	: 28/04/2023	SAMPLING TIME	: 14:50-15:15, 15:25-15:45
RECEIVED DATE	: 02/05/2023	ANALYTICAL DATE	: 08-09/05/2023
REPORT DATE	: 15/05/2023	SITE OPERATOR	: Mr. Aniwat Pimwanna
SAMPLE CONDITION	: Normal	FILE CODE	: 223010_Soil_May

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^{1/}
				MW 23	MW 24	
alpha-BHC	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 0.3
gamma-BHC	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 29
Heptachlor	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 5.5
Aldrin	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 0.1
beta-BHC	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 0.9
delta-BHC	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	-
Heptachlor epoxide	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 2.7
o,p'-DDE	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 0.001
Endosulfan I	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	-
gamma-Chlordane	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 110
alpha-Chlordane	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 110
p,p'-DDE	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 0.001
Dieldrin	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 1.5
o,p'-DDD	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 7
Endrin	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 25
o,p'-DDT	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 120
p,p'-DDD	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 7
Endosulfan II	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	-
p,p'-DDT	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 120
Endrin aldehyde	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	-
Endosulfan sulfate	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	-
Endrin ketone	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	-

REFERENCE: U.S. EPA SW-846 TEST METHODS FOR EVALUATING WATER AND SOLID WASTE, 3rd ED., 2020

Sudaporn Soonthorn

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-9-0001

Araya Tipparak

(Mrs. Araya Tipparak)

Technical Management Team

REG. NO. 7-239-9-5863

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4. - Not available.



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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND

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

SOIL SAMPLES ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical PCL, Branch 6 (Refinery) REQUEST SERVICE No. : 0645/66
SAMPLING BY : SECOT Co., Ltd. SAMPLING METHOD : Hand Auger
SAMPLING DATE : 26-27/04/2023 SAMPLING TIME : 16:15-16:40, 11:00-11:20
RECEIVED DATE : 28/04/2023 ANALYTICAL DATE : 28/04/2023-05/05/2023
REPORT DATE : 15/05/2023 SITE OPERATOR : Mr. Aniwat Pimwanna
SAMPLE CONDITION : Normal FILE CODE : 223010_Soil_April

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^{1/}
				MW 34	MW 35	
pH	-	4500-H B	-	8.18	8.68	-
Conductivity	dS/m	EC25 (1:5) / Electrical Conductivity	-	0.020	0.031	-
Salinity	ppt	EC25 (1:5) / Electrical Conductivity	-	0.0	0.0	-
Arsenic (As)	mg/kg	3050 B/6010 D	< 2.00	2.30	3.98	≤ 27
Cadmium (Cd)	mg/kg	3050 B/6010 D	< 1.00	ND	ND	≤ 810
Lead (Pb)	mg/kg	3050 B/6010 D	< 3.00	5.62	5.77	≤ 750
Mercury (Hg)	mg/kg	7471B	< 0.05	ND	0.27	≤ 610
Nickel (Ni)	mg/kg	3050 B/6010 D	< 1.00	2.86	2.09	≤ 41,000

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

Khemchuda Inorn

(Miss Khemchuda Inorn)

Analyst

REG. NO. 3-239-n-5976

(Mrs. Araya Tipparak)

(Mrs. Araya Tipparak)

Technical Management Team

REG. NO. 3-239-n-5863

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 4. Reference method : Operation Manual Chemical Analysis in Soil, Land Development Department.
 5. - Not available.



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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND

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SAMPLING DATE : 26-27/04/2023 SAMPLING TIME : 16:15-16:40, 11:00-11:20
RECEIVED DATE : 28/04/2023 ANALYTICAL DATE : 03-06, 08/05/2023
REPORT DATE : 15/05/2023 SITE OPERATOR : Mr. Aniwat Pimwanna
SAMPLE CONDITION : Normal FILE CODE : 223010_Soil_April

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^{1/}
				MW 34	MW 35	
Naphthalene	mg/kg	3540 C / 8270 E	< 0.005	ND	ND	≤ 1,000
Benzene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 15
Ethylbenzene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 230
Toluene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 520
m-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 210
o-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 210
p-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 210
Total Xylenes	mg/kg	5035 A / 8260 D	< 0.00075	ND	ND	≤ 210

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

Jutarat Jaemruen

(Miss Jutarat Jaemruen)

Analyst

REG. NO. 3-239-n-5827

(Mrs. Araya Tipparak)

(Mrs. Araya Tipparak)

Technical Management Team

REG. NO. 3-239-n-5863

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 4. - Not available.



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SOIL SAMPLES ANALYSIS REPORT

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SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Hand Auger
SAMPLING DATE	: 26-27/04/2023	SAMPLING TIME	: 16:15-16:40, 11:00-11:20
RECEIVED DATE	: 28/04/2023	ANALYTICAL DATE	: 05-09-11/05/2023
REPORT DATE	: Normal	SITE OPERATOR	: Mr. Aniwat Pimwanna
SAMPLE CONDITION	: Normal	FILE CODE	: 223010_Soil_April

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ¹⁾
				MW 34	MW 35	
Total Petroleum Hydrocarbon						
- TPH (C ₁ - C ₈)	mg/kg	5035 A / 8260 D	< 0.003	ND	ND	≤ 25
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
- TPH (C ₉ - C ₁₆)	mg/kg	3540 C / 8015 D	< 0.25	ND	2.18	≤ 25
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
- TPH (C ₁₇ - C ₃₅)	mg/kg	3540 C / 8015 D	< 1.85	ND	ND	≤ 8
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- n-Dotriacontane						
- n-Tetracontane						
- Pentatriacontane						

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

Sudaporn Soonthorn

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 2-239-B-0001

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 2-239-B-5863

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

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3. ¹⁾ Notification of the Ministry of Industry, B.E.2559 (2016).



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SOIL SAMPLES ANALYSIS REPORT

CLIENT NAME	: PTT Global Chemical PCL, Branch 6 (Refinery)	REQUEST SERVICE No.	: 0645/66
SAMPLING BY	: SECOT Co., Ltd.	SAMPLING METHOD	: Hand Auger
SAMPLING DATE	: 26-27/04/2023	SAMPLING TIME	: 16:15-16:40, 11:00-11:20
RECEIVED DATE	: 28/04/2023	ANALYTICAL DATE	: 08-09/05/2023
REPORT DATE	: 15/05/2023	SITE OPERATOR	: Mr. Aniwat Pimwanna
SAMPLE CONDITION	: Normal	FILE CODE	: 223010_Soil_April

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ¹⁾
				MW 34	MW 35	
alpha-BHC	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 0.3
gamma-BHC	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 29
Heptachlor	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 5.5
Aldrin	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 0.1
beta-BHC	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 0.9
delta-BHC	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	-
Heptachlor epoxide	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 2.7
o,p'-DDE	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 0.001
Endosulfan I	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	-
gamma-Chlordane	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 110
alpha-Chlordane	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 110
p,p'-DDE	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 0.001
Dieldrin	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 1.5
o,p'-DDD	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 7
Endrin	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 25
o,p'-DDT	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 120
p,p'-DDD	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 7
Endosulfan II	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	-
p,p'-DDT	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 120
Endrin aldehyde	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	-
Endosulfan sulfate	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	-
Endrin ketone	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	-

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

Sudaporn Soonthorn

(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 2-239-B-0001

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 2-239-B-5863

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3. ¹⁾ Notification of the Ministry of Industry, B.E.2559 (2016).

4. - Not available.



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SOIL SAMPLES ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical PCL, Branch 6 (Refinery) REQUEST SERVICE No. : 0676/66
SAMPLING BY : SECOT Co., Ltd. SAMPLING METHOD : Hand Auger
SAMPLING DATE : 03/05/2023 SAMPLING TIME : 11:35-11:55, 10:27-10:45
RECEIVED DATE : 04/05/2023 ANALYTICAL DATE : 04-05/05/2023
REPORT DATE : 15/05/2023 SITE OPERATOR : Mr. Aniwat Pimwanna
SAMPLE CONDITION : Normal FILE CODE : 223010_Soil_May

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^{1/}
				MW 41	MW 42	
pH	-	4500-H ¹ B	-	8.87	8.88	-
Conductivity	dS/m	EC25 (1:5) / Electrical Conductivity	-	0.056	0.031	-
Salinity	ppt	EC25 (1:5) / Electrical Conductivity	-	0.0	0.0	-
Arsenic (As)	mg/kg	3050 B/6010 D	< 2.00	3.56	ND	≤ 27
Cadmium (Cd)	mg/kg	3050 B/6010 D	< 1.00	ND	ND	≤ 810
Lead (Pb)	mg/kg	3050 B/6010 D	< 3.00	5.07	ND	≤ 750
Mercury (Hg)	mg/kg	7471B	< 0.05	ND	ND	≤ 610
Nickel (Ni)	mg/kg	3050 B/6010 D	< 1.00	3.02	ND	≤ 41,000

REFERENCE : US EPA SW-846 TEST METHODS FOR EVALUATING WATER AND SOLID WASTE, 8th ED., 2006

Khemchuda Insorn

(Miss Khemchuda Insorn)

Analyst

REG. NO. 7-239-n-5976

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-n-5863

- 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 Industry, B.E.2559 (2016).
 4. Reference method : Operation Manual Chemical Analysis in Soil, Land Development Department.
 5. - Not available.



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SOIL SAMPLES ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical PCL, Branch 6 (Refinery) REQUEST SERVICE No. : 0676/66
SAMPLING BY : SECOT Co., Ltd. SAMPLING METHOD : Hand Auger
SAMPLING DATE : 03/05/2023 SAMPLING TIME : 11:35-11:55, 10:27-10:45
RECEIVED DATE : 04/05/2023 ANALYTICAL DATE : 05-06, 08/05/2023
REPORT DATE : 15/05/2023 SITE OPERATOR : Mr. Aniwat Pimwanna
SAMPLE CONDITION : Normal FILE CODE : 223010_Soil_May

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ^{1/}
				MW 41	MW 42	
Naphthalene	mg/kg	3540 C / 8270 E	< 0.005	ND	ND	≤ 1,000
Benzene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 15
Ethylbenzene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 230
Toluene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 520
m-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 210
o-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 210
p-Xylene	mg/kg	5035 A / 8260 D	< 0.00025	ND	ND	≤ 210
Total Xylenes	mg/kg	5035 A / 8260 D	< 0.00075	ND	ND	≤ 210

REFERENCE : US EPA SW-846 TEST METHODS FOR EVALUATING WATER AND SOLID WASTE, 8th ED., 2006

Jutarat Jaemruen

(Miss Jutarat Jaemruen)

Analyst

REG. NO. 7-239-n-5827

Araya Tipparuk

(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-n-5863

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SOIL SAMPLES ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical PCL, Branch 6 (Refinery) REQUEST SERVICE No. : 0676/66
SAMPLING BY : SECOT Co., Ltd. SAMPLING METHOD : Hand Auger
SAMPLING DATE : 03/05/2023 SAMPLING TIME : 11:35-11:55, 10:27-10:45
RECEIVED DATE : 04/05/2023 ANALYTICAL DATE : 05-09-11/05/2023
REPORT DATE : Normal SITE OPERATOR : Mr. Aniwat Pimwanna
SAMPLE CONDITION : Normal FILE CODE : 223010_Soil_May

PARAMETER	UNIT	ANALYSIS	ND	STATION		STANDARD ^{1/}
		METHODS	(non-detectable)	MW 41	MW 42	
Total Petroleum Hydrocarbon						
- TPH (C ₇ - C ₈)	mg/kg	5035 A / 8260 D	< 0.003	ND	ND	≤ 25
- Pentane						
- Benzene						
- Toluene						
- m,p-Xylene						
- o-Xylene						
- Ethylbenzene						
- TPH (C ₉ - C ₁₆)	mg/kg	3540 C / 8015 D	< 0.25	ND	1.70	≤ 25
- n-Nonane						
- n-Decane						
- n-Dodecane						
- n-Tetradecane						
- n-Hexadecane						
- TPH (C ₁₆ - C ₃₅)	mg/kg	3540 C / 8015 D	< 1.85	ND	ND	≤ 8
- n-Octadecane						
- n-Eicosane						
- n-Docosane						
- n-Tetracosane						
- n-Hexacosane						
- n-Octacosane						
- n-Triacontane						
- n-Dotriacontane						
- n-Tetratriacontane						
- Pentatriacontane						

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

Sudaporn Soonthorn
(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-8-0001

Araya Tipparuk
(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-8-5863

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SOIL SAMPLES ANALYSIS REPORT

CLIENT NAME : PTT Global Chemical PCL, Branch 6 (Refinery) REQUEST SERVICE No. : 0676/66
SAMPLING BY : SECOT Co., Ltd. SAMPLING METHOD : Hand Auger
SAMPLING DATE : 03/05/2023 SAMPLING TIME : 11:35-11:55, 10:27-10:45
RECEIVED DATE : 04/05/2023 ANALYTICAL DATE : 08-09/05/2023
REPORT DATE : 15/05/2023 SITE OPERATOR : Mr. Aniwat Pimwanna
SAMPLE CONDITION : Normal FILE CODE : 223010_Soil_May

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION		STANDARD ¹⁾
				MW 41	MW 42	
alpha-BHC	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 0.3
gamma-BHC	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 29
Heptachlor	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 5.5
Aldrin	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 0.1
beta-BHC	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 0.9
delta-BHC	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	-
Heptachlor epoxide	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 2.7
o,p'-DDE	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 0.001
Endosulfan I	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	-
gamma-Chlordane	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 110
alpha-Chlordane	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 110
p,p'-DDE	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 0.001
Dieldrin	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 1.5
o,p'-DDD	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 7
Endrin	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 25
o,p'-DDT	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 120
p,p'-DDD	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 7
Endosulfan II	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	-
p,p'-DDT	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	≤ 120
Endrin aldehyde	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	-
Endosulfan sulfate	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	-
Endrin ketone	mg/kg	3550 C / 8081 B	< 0.0002	ND	ND	-

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

Sudaporn Soonthorn
(Miss Sudaporn Soonthorn)

Analyst

REG. NO. 7-239-8-0001

Araya Tipparuk
(Mrs. Araya Tipparuk)

Technical Management Team

REG. NO. 7-239-8-5863

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 4. - Not available.

ระดับเสียงในพื้นที่ทำงาน



Noise Monitoring Result : Working Noise MTR-PTTGC6-Refinery

Location : Air Compressor (K-1701 A, B and Spare) (Panel 3)	Monitor Period : May 02, 2024
SLM Model : SCARLET ST-21D	Serial No : 820722
Site Operator : Miss Wiraya Patchimboon	

Calibrator Model : Cirrus CR:515	Serial No : 97097
Calibration Ref dB(A) : 94.0	Certified Date : Sep 04, 2023
SLM Reading / Adjust dB(A) : 93.8/0.0	Expire Date : Sep 03, 2024
Cal Sheet No.: CR-515-2024-121	

Time	Equivalent Sound Pressure Level (dB(A))
	May 02, 2024
00:00 - 01:00	
01:00 - 02:00	
02:00 - 03:00	
03:00 - 04:00	
04:00 - 05:00	
05:00 - 06:00	
06:00 - 07:00	
07:00 - 08:00	
08:00 - 09:00	
09:00 - 10:00	84.5
10:00 - 11:00	84.5
11:00 - 12:00	84.5
12:00 - 13:00	84.7
13:00 - 14:00	84.7
14:00 - 15:00	84.6
15:00 - 16:00	84.5
16:00 - 17:00	84.2
17:00 - 18:00	
18:00 - 19:00	
19:00 - 20:00	
20:00 - 21:00	
21:00 - 22:00	
22:00 - 23:00	
23:00 - 24:00	
Leq(8)*	84.5
Lmax **	90.6
Standard-8Hr	90 dB(A)
Standard-Max	140 dB(A)

Remark : * Average time between 09:00-17:00

** Maximum Sound Pressure Level between 09:00-17:00

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Sununta Sirawuttinanon)
Technical Management Team



Noise Monitoring Result : Working Noise MTR-PTTGC6-Refinery

Location : Air Blower (K-1001 of K-1003) (Panel 1)	Monitor Period : Apr 30, 2024
SLM Model : SCARLET ST-21D	Serial No : 820722
Site Operator : Miss Wiraya Patchimboon	

Calibrator Model : Cirrus CR:515	Serial No : 97097
Calibration Ref dB(A) : 94.0	Certified Date : Sep 04, 2023
SLM Reading / Adjust dB(A) : 93.9/-0.1	Expire Date : Sep 03, 2024
Cal Sheet No.: CR-515-2024-120	

Time	Equivalent Sound Pressure Level (dB(A))
	Apr 30, 2024
00:00 - 01:00	
01:00 - 02:00	
02:00 - 03:00	
03:00 - 04:00	
04:00 - 05:00	
05:00 - 06:00	
06:00 - 07:00	
07:00 - 08:00	
08:00 - 09:00	
09:00 - 10:00	81.6
10:00 - 11:00	81.8
11:00 - 12:00	81.9
12:00 - 13:00	81.5
13:00 - 14:00	81.4
14:00 - 15:00	81.4
15:00 - 16:00	81.4
16:00 - 17:00	81.5
17:00 - 18:00	
18:00 - 19:00	
19:00 - 20:00	
20:00 - 21:00	
21:00 - 22:00	
22:00 - 23:00	
23:00 - 24:00	
Leq(8)*	81.6
Lmax **	88.1
Standard-8Hr	90 dB(A)
Standard-Max	140 dB(A)

Remark : * Average time between 09:00-17:00

** Maximum Sound Pressure Level between 09:00-17:00

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Sununta Sirawuttinanon)
Technical Management Team



Noise Monitoring Result : Working Noise MTR-PTTGC6-Refinery

Location : Fan (Below E-1791) (Panel 3) Monitor Period : May 02, 2024
SLM Model : SCARLET ST-21D Serial No : 820723
Site Operator : Miss Wiraya Patchimboon

Calibrator Model : Cirrus CR:515 Serial No : 97097
Calibration Ref dB(A) : 94.0 Certified Date : Sep 04, 2023
SLM Reading / Adjust dB(A) : 93.7/0.1 Expire Date : Sep 03, 2024
Cal Sheet No.: CR-515-2024-121

Time	Equivalent Sound Pressure Level (dB(A))	
	May 02, 2024	
00:00 - 01:00		
01:00 - 02:00		
02:00 - 03:00		
03:00 - 04:00		
04:00 - 05:00		
05:00 - 06:00		
06:00 - 07:00		
07:00 - 08:00		
08:00 - 09:00		
09:00 - 10:00		
10:00 - 11:00	76.8	
11:00 - 12:00	76.8	
12:00 - 13:00	76.9	
13:00 - 14:00	76.9	
14:00 - 15:00	76.8	
15:00 - 16:00	76.8	
16:00 - 17:00	76.8	
17:00 - 18:00	76.7	
18:00 - 19:00		
19:00 - 20:00		
20:00 - 21:00		
21:00 - 22:00		
22:00 - 23:00		
23:00 - 24:00		
Leq(8)*	76.8	
Lmax **	82.1	
Standard-8Hr	90 dB(A)	
Standard-Max	140 dB(A)	

Remark : * Average time between 10:00-18:00
** Maximum Sound Pressure Level between 10:00-18:00

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Sununta Sirawuttinanon)
Technical Management Team



Noise Monitoring Result : Working Noise MTR-PTTGC6-Refinery

Location : Generator (Gas Turbine) (Panel 4) Monitor Period : May 03, 2024
SLM Model : SCARLET ST-21D Serial No : 820722
Site Operator : Miss Wiraya Patchimboon

Calibrator Model : Cirrus CR:515 Serial No : 97097
Calibration Ref dB(A) : 94.0 Certified Date : Sep 04, 2023
SLM Reading / Adjust dB(A) : 93.8/0.0 Expire Date : Sep 03, 2024
Cal Sheet No.: CR-515-2024-122

Time	Equivalent Sound Pressure Level (dB(A))	
	May 03, 2024	
00:00 - 01:00		
01:00 - 02:00		
02:00 - 03:00		
03:00 - 04:00		
04:00 - 05:00		
05:00 - 06:00		
06:00 - 07:00		
07:00 - 08:00		
08:00 - 09:00		
09:00 - 10:00	78.8	
10:00 - 11:00	78.7	
11:00 - 12:00	78.8	
12:00 - 13:00	78.9	
13:00 - 14:00	78.8	
14:00 - 15:00	78.8	
15:00 - 16:00	78.8	
16:00 - 17:00	78.9	
17:00 - 18:00		
18:00 - 19:00		
19:00 - 20:00		
20:00 - 21:00		
21:00 - 22:00		
22:00 - 23:00		
23:00 - 24:00		
Leq(8)*	78.8	
Lmax **	84.5	
Standard-8Hr	90 dB(A)	
Standard-Max	140 dB(A)	

Remark : * Average time between 09:00-17:00
** Maximum Sound Pressure Level between 09:00-17:00

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

(Miss Sununta Sirawuttinanon)
Technical Management Team



Noise Monitoring Result : Working Noise MTR-PTTGC6-Refinery

Location : Steam Turbine (Steam Generators) (Panel 4)	Monitor Period : May 03, 2024
SLM Model : SCARLET ST-21D	Serial No : 820723
Site Operator : Miss Wiraya Patchimboon	

Calibrator Model : Cirrus CR:515	Serial No : 97097
Calibration Ref dB(A) : 94.0	Certified Date : Sep 04, 2023
SLM Reading / Adjust dB(A) : 93.8/0.0	Expire Date : Sep 03, 2024
Cal Sheet No.: CR-515-2024-122	

Time	Equivalent Sound Pressure Level (dB(A))
	May 03, 2024
00:00 - 01:00	
01:00 - 02:00	
02:00 - 03:00	
03:00 - 04:00	
04:00 - 05:00	
05:00 - 06:00	
06:00 - 07:00	
07:00 - 08:00	
08:00 - 09:00	
09:00 - 10:00	83.9
10:00 - 11:00	84.2
11:00 - 12:00	84.3
12:00 - 13:00	84.1
13:00 - 14:00	84.0
14:00 - 15:00	84.2
15:00 - 16:00	84.1
16:00 - 17:00	84.2
17:00 - 18:00	
18:00 - 19:00	
19:00 - 20:00	
20:00 - 21:00	
21:00 - 22:00	
22:00 - 23:00	
23:00 - 24:00	

Leq(8)*	84.1
Lmax **	99.7

Standard-8Hr	90 dB(A)
Standard-Max	140 dB(A)

Remark : * Average time between 09:00-17:00

** Maximum Sound Pressure Level between 09:00-17:00

(Miss Katesarin Vorradetwittaya)
Environmental Scientist(Miss Sununta Sirawuttinanon)
Technical Management Team

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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND

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

NOISE MEASUREMENT REPORT : NOISE DOSE

CLIENT NAME	: PTT Global Chemical Public Co., Ltd.	REFERENCE NO.	: PTTGC6 (Refinery)_224010_Cert-NsD/Apr24
	Branch 6 (Refinery)	INSTRUMENT	: Noise Dosimeter
MEASUREMENT BY	: SECOT Co., Ltd.	CALIBRATOR TYPE	: RC 110A
MEASUREMENT DATE	: 30/04/2024	SERIAL NO.	: 95167
MEASUREMENT LOCATION	: Process area	CALIBRATOR REF.	: 114 dB @1,000 Hz
SITE OPERATOR	: Miss Wiraya Patchimboon		

OPERATOR ID	RESPONSIBILITY/AREA	TIME	RESULTS		STANDARD*
			% DOSE	TWA (12 hr) (dBA)	TWA (12 hr) (dBA)
ID 26005244	Operator Panel 1	08.30-19.38	53.7	80.6	83.0

(Miss Katesarin Vorradetwittaya)
Environmental Scientist
(Miss Sununta Sirawuttinanon)
Technical Management Team

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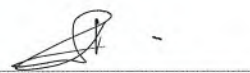
239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND

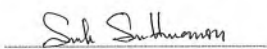
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NOISE MEASUREMENT REPORT : NOISE DOSE

CLIENT NAME : PTT Global Chemical Public Co., Ltd. REFERENCE NO. : PTTGC6 (Refinery)_224010_Cert-NsD/Apr24
Branch 6 (Refinery) INSTRUMENT : Noise Dosimeter
MEASUREMENT BY : SECOT Co., Ltd. CALIBRATOR TYPE : RC 110A
MEASUREMENT DATE : 30/04/2024 SERIAL NO. : 95167
MEASUREMENT LOCATION : Process area CALIBRATOR REF. : 114 dB @1,000 Hz
SITE OPERATOR : Miss Wiraya Patchimboon

OPERATOR ID	RESPONSIBILITY/AREA	TIME	RESULTS		STANDARD*
			% DOSE	TWA (12 hr) (dBA)	
ID 26002958	Operator Panel 2	08.27-19.40	71.4	81.8	83.0


(Miss Katesarin Vorradetwittaya)
Environmental Scientist


(Miss Sununta Sirawuttinanon)
Technical Management Team

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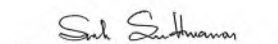
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NOISE MEASUREMENT REPORT : NOISE DOSE

CLIENT NAME : PTT Global Chemical Public Co., Ltd. REFERENCE NO. : PTTGC6 (Refinery)_224010_Cert-NsD/May24
Branch 6 (Refinery) INSTRUMENT : Noise Dosimeter
MEASUREMENT BY : SECOT Co., Ltd. CALIBRATOR TYPE : RC 110A
MEASUREMENT DATE : 02/05/2024 SERIAL NO. : 95167
MEASUREMENT LOCATION : Process area CALIBRATOR REF. : 114 dB @1,000 Hz
SITE OPERATOR : Miss Wiraya Patchimboon

OPERATOR ID	RESPONSIBILITY/AREA	TIME	RESULTS		STANDARD*
			% DOSE	TWA (12 hr) (dBA)	
ID 26006895	Operator Panel 3	07.59-19.38	39.4	79.2	83.0


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Environmental Scientist


(Miss Sununta Sirawuttinanon)
Technical Management Team

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

NOISE MEASUREMENT REPORT : NOISE DOSE

CLIENT NAME : PTT Global Chemical Public Co., Ltd. REFERENCE NO. : PTTGC6 (Refinery)_224010_Cert-NsD/May24
Branch 6 (Refinery) INSTRUMENT : Noise Dosimeter
MEASUREMENT BY : SECOT Co., Ltd. CALIBRATOR TYPE : RC 110A
MEASUREMENT DATE : 03/05/2024 SERIAL NO. : 95167
MEASUREMENT LOCATION : Process area CALIBRATOR REF. : 114 dB @1,000 Hz
SITE OPERATOR : Miss Wiraya Patchimboon

OPERATOR ID	RESPONSIBILITY/AREA	TIME	RESULTS		STANDARD*
			% DOSE	TWA (12 hr) (dBA)	
ID 26006557	Operator Panel 4	08.00-20.01	28.5	77.8	83.0

(Miss Katesarin Vorradetwittaya)

Environmental Scientist

(Miss Sununta Sirawuttinanon)

Technical Management Team

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

NOISE MEASUREMENT REPORT : NOISE DOSE

CLIENT NAME : PTT Global Chemical Public Co., Ltd. REFERENCE NO. : PTTGC6 (Refinery)_224010_Cert-NsD/Apr24
Branch 6 (Refinery) INSTRUMENT : Noise Dosimeter
MEASUREMENT BY : SECOT Co., Ltd. CALIBRATOR TYPE : RC 110A
MEASUREMENT DATE : 30/04/2024 SERIAL NO. : 95167
MEASUREMENT LOCATION : Process area CALIBRATOR REF. : 114 dB @1,000 Hz
SITE OPERATOR : Miss Wiraya Patchimboon

OPERATOR ID	RESPONSIBILITY/AREA	TIME	RESULTS		STANDARD*
			% DOSE	TWA (12 hr) (dBA)	
ID 26009120	Operator Panel 5	07.21-18.36	37.4	79.0	83.0

(Miss Katesarin Vorradetwittaya)

Environmental Scientist

(Miss Sununta Sirawuttinanon)

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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND

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

NOISE MEASUREMENT REPORT : NOISE DOSE

CLIENT NAME : PTT Global Chemical Public Co., Ltd. REFERENCE NO. : PTTGC6 (Refinery)_224010_Cert-NsD/Apr24
Branch 6 (Refinery) INSTRUMENT : Noise Dosimeter
MEASUREMENT BY : SECOT Co., Ltd. CALIBRATOR TYPE : RC 110A
MEASUREMENT DATE : 30/04/2024 SERIAL NO. : 95167
MEASUREMENT LOCATION : Maintenance CALIBRATOR REF. : 114 dB @1,000 Hz
SITE OPERATOR : Miss Wiraya Patchimboon

OPERATOR ID	RESPONSIBILITY/AREA	TIME	RESULTS		STANDARD*
			% DOSE	TWA (8 hr) (dBA)	
ID 98012658	Operator Maintenance	09.06-17.06	49.6	82.0	85.0

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Environmental Scientist

(Miss Sununta Sirawuttinanon)

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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND
TEL. (662) 959-3600 FAX (662) 959-3535 Website: secot.co.th E-mail: envserv@secot.co.th

ANALYSIS/TEST REPORT

Customer	: EED/SECOT Co., Ltd.	Request Service No.	: 0340/67
For	: PTT Global Chemical Public Co., Ltd, Branch 6 (Refinery GC6)	Sampling Date	: 19-22/02/2024
Address	: No.8, I-8 Road, Map Ta Phut Industrial Estate, Map Ta Phut, Mueang Rayong , Rayong Province 21150	Received Date	: 22, 27/02/2024
Tel/Fax	: 0-3897-1000 / -	Test Date	: 28/02/2024, 01-02/03/2024
		Report Date	: 07/03/2024

SAMPLE DESCRIPTION / SAMPLING INFORMATION

Sample Designated As	: Workplace Air	Sampling Method	: Sorbent Adsorption
Sampling By	: SECOT Co., Ltd.	Sample Condition	: Normal

Sampling Location	Sampling Date/Time	Compound	Analytical Method	ND ppm	RESULT ppm	STANDARD ppm
Panel 1	19/02/2024 09:15-13:15	Hydrogen sulfide	NIOSH 6013/IC	< 0.03	ND	20
Panel 2	20/02/2024 08:59-12:59	Hydrogen sulfide	NIOSH 6013/IC	< 0.03	ND	20
Panel 3	21/02/2024 09:00-13:00	Hydrogen sulfide	NIOSH 6013/IC	< 0.03	ND	20
Panel 5	22/02/2024 09:37-13:37	Hydrogen sulfide	NIOSH 6013/IC	< 0.03	ND	20

Analyst By: Janista Kui-on
(Miss Janista Kui-on)

Approved By: Mairisa Poowasanpetch
(Miss Narisa Poowasanpetch)
Technical Management Team

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The maximum concentration limit during any working time.
4. ND = non-detectable.



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

ANALYSIS/TEST REPORT

Customer	: EED/SECOT Co., Ltd.	Request Service No.	: 0947/67
For	: PTT Global Chemical Public Co., Ltd, Branch 6 (Refinery GC6)	Sampling Date	: 13-15, 20/05/2024
Address	: No.8, I-8 Road, Map Ta Phut Industrial Estate, Map Ta Phut, Mueang Rayong , Rayong Province 21150	Received Date	: 16, 23/05/2024
Tel/Fax	: 0-3897-1000 / -	Test Date	: 24/05/2024
		Report Date	: 30/05/2024

SAMPLE DESCRIPTION / SAMPLING INFORMATION

Sample Designated As	: Workplace Air	Sampling Method	: Sorbent Adsorption
Sampling By	: SECOT Co., Ltd.	Sample Condition	: Normal

Sampling Location	Sampling Date/Time	Compound	Analytical Method	ND ppm	RESULT ppm	STANDARD ppm
Panel 1	13/05/2024 10:01-14:01	Hydrogen sulfide	NIOSH 6013/IC	< 0.03	ND	20
Panel 2	14/05/2024 09:00-13:00	Hydrogen sulfide	NIOSH 6013/IC	< 0.03	ND	20
Panel 3	15/05/2024 11:12-15:12	Hydrogen sulfide	NIOSH 6013/IC	< 0.03	ND	20
Panel 5	20/05/2024 09:00-13:00	Hydrogen sulfide	NIOSH 6013/IC	< 0.03	ND	20

Analyst By: Phatchara Samanchan
(Miss Phatchara Samanchan)

Approved By: Mairisa Poowasanpetch
(Miss Narisa Poowasanpetch)
Technical Management Team

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

ANALYSIS/TEST REPORT

Customer	: EED/SECOT Co., Ltd.	Request Service No.	: 0340/67
For	: PTT Global Chemical Public Co., Ltd, Branch 6 (Refinery GC6)	Sampling Date	: 19-23/02/2024
Address	: No.8, I-8 Road, Map Ta Phut Industrial Estate, Map Ta Phut, Mueang Rayong , Rayong Province 21150	Received Date	: 22, 27/02/2024
Tel/Fax	: 0-3897-1000 / -	Test Date	: 27/02/2024, 01/03/2024
		Report Date	: 07/03/2024

SAMPLE DESCRIPTION / SAMPLING INFORMATION

Sample Designated As	: Workplace Air	Sampling Method	: Passive Diffusion
Sampling By	: SECOT Co., Ltd.	Sample Condition	: Normal

Sampling Location	Sampling Date/Time	Compound	Analytical Method	ND ppm	RESULT ppm	STANDARD ppm
Panel 1	19/02/2024 09:37-13:37	Benzene	OSHA 1005/ GC FID	< 0.04	ND	1 ^u
Panel 2	20/02/2024 09:20-13:20	Benzene	OSHA 1005/ GC FID	< 0.04	ND	1 ^u
Panel 3	21/02/2024 09:12-13:12	Benzene	OSHA 1005/ GC FID	< 0.04	ND	1 ^u
Panel 5	22/02/2024 09:37-13:37	Benzene	OSHA 1005/ GC FID	< 0.04	ND	1 ^u
Panel 6	23/02/2024 09:35-13:35	Benzene	OSHA 1005/ GC FID	< 0.04	ND	1 ^u
สถานีขนถ่ายน้ำมันทางรถบรรทุก	23/02/2024 11:40-15:40	Benzene	OSHA 1005/ GC FID	< 0.04	ND	1 ^u

Analyst By :

Sudaporn S.

(Miss Sudaporn Soonthorn)

Approved By :

Mairin Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

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- ^uThe average concentration limit during normal working period.
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ANALYSIS/TEST REPORT

Customer	: EED/SECOT Co., Ltd.	Request Service No.	: 0947/67
For	: PTT Global Chemical Public Co., Ltd, Branch 6 (Refinery GC6)	Sampling Date	: 13, 15-16, 20-21/05/2024
Address	: No.8, I-8 Road, Map Ta Phut Industrial Estate, Map Ta Phut, Mueang Rayong , Rayong Province 21150	Received Date	: 16, 18, 23/05/2024
Tel/Fax	: 0-3897-1000 / -	Test Date	: 21, 28/05/2024
		Report Date	: 30/05/2024

SAMPLE DESCRIPTION / SAMPLING INFORMATION

Sample Designated As	: Workplace Air	Sampling Method	: Passive Diffusion
Sampling By	: SECOT Co., Ltd.	Sample Condition	: Normal

Sampling Location	Sampling Date/Time	Compound	Analytical Method	ND ppm	RESULT ppm	STANDARD ppm
Panel 1	13/05/2024 10:14-14:14	Benzene	OSHA 1005/ GC FID	< 0.04	ND	1
Panel 2	13/05/2024 09:00-13:00	Benzene	OSHA 1005/ GC FID	< 0.04	0.69	1
Panel 3	15/05/2024 11:10-15:10	Benzene	OSHA 1005/ GC FID	< 0.04	ND	1
Panel 5	20/05/2024 09:00-13:00	Benzene	OSHA 1005/ GC FID	< 0.04	ND	1
Panel 6	16/05/2024 09:10-13:10	Benzene	OSHA 1005/ GC FID	< 0.04	ND	1
สถานีขนถ่ายน้ำมันทางรถบรรทุก	21/05/2024 09:40-13:40	Benzene	OSHA 1005/ GC FID	< 0.04	ND	1

Analyst By :

Sudaporn S.

(Miss Sudaporn Soonthorn)

Approved By :

Mairin Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

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

ANALYSIS/TEST REPORT

Customer	: EED/SECOT Co., Ltd.	Request Service No.	: 0359/67
For	: PTT Global Chemical Public Co., Ltd, Branch 6 (Refinery GC6)	Sampling Date	: 21/02/2024
Address	: No.8, I-8 Road, Map Ta Phut Industrial Estate, Map Ta Phut, Mueang Rayong , Rayong Province 21150	Received Date	: 27/02/2024
Tel/Fax	: 0-3897-1000 / -	Test Date	: 01/03/2024
		Report Date	: 07/03/2024

SAMPLE DESCRIPTION / SAMPLING INFORMATION

Sample Designated As	: Workplace Air	Sampling Method	: Sampling Bag
Sampling By	: SECOT Co., Ltd.	Sample Condition	: Normal

Sampling Location	Sampling Date/Time	Compound	Analytical Method	ND ppm	RESULT ppm	STANDARD ppm
Panel 3	21/02/2024 09:00-09:15	NMHC	THC Analyzer/FID	< 0.05	0.54	-

Analyst By:

Sudaporn S.

(Miss Sudaporn Soonthorn)

Approved By:

Miss Narisa Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

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

ANALYSIS/TEST REPORT

Customer	: EED/SECOT Co., Ltd.	Request Service No.	: 0947/67
For	: PTT Global Chemical Public Co., Ltd, Branch 6 (Refinery GC6)	Sampling Date	: 15/05/2024
Address	: No.8, I-8 Road, Map Ta Phut Industrial Estate, Map Ta Phut, Mueang Rayong , Rayong Province 21150	Received Date	: 16/05/2024
Tel/Fax	: 0-3897-1000 / -	Test Date	: 20/05/2024
		Report Date	: 30/05/2024

SAMPLE DESCRIPTION / SAMPLING INFORMATION

Sample Designated As	: Workplace Air	Sampling Method	: Sampling Bag
Sampling By	: SECOT Co., Ltd.	Sample Condition	: Normal

Sampling Location	Sampling Date/Time	Compound	Analytical Method	ND ppm	RESULT ppm	STANDARD ppm
Panel 3	15/05/2024 11:12-11:27	NMHC	THC Analyzer/FID	< 0.05	0.39	-

Analyst By:

Sudaporn S.

(Miss Sudaporn Soonthorn)

Approved By:

Miss Narisa Poowasanpetch

(Miss Narisa Poowasanpetch)

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239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND

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

ANALYSIS/TEST REPORT

Customer	: EED/SECOT Co., Ltd.	Request Service No.	: 0340/67
For	: PTT Global Chemical Public Co., Ltd, Branch 6 (Refinery GC6)	Sampling Date	: 19-20, 22-23/02/2024
Address	: No.8, I-8 Road, Map Ta Phut Industrial Estate, Map Ta Phut, Mueang Rayong, Rayong Province 21150	Received Date	: 22, 27/02/2024
Tel/Fax	: 0-3897-1000 / -	Test Date	: 23/02/2024, 01/03/2024
		Report Date	: 07/03/2024

SAMPLE DESCRIPTION / SAMPLING INFORMATION

Sample Designated As	: Workplace Air	Sampling Method	: Sampling Bag
Sampling By	: SECOT Co., Ltd.	Sample Condition	: Normal

Sampling Location	Sampling Date/Time	Compound	Analytical Method	ND ppm	RESULT ppm	STANDARD ppm
Panel 1	19/02/2024 09:41-09:56	Total Hydrocarbon	THC Analyzer / FID	< 0.10	5.07	-
Panel 2	20/02/2024 09:20-09:35	Total Hydrocarbon	THC Analyzer / FID	< 0.10	5.04	-
Panel 4	19/02/2024 10:35-10:50	Total Hydrocarbon	THC Analyzer / FID	< 0.10	5.67	-
Panel 5	22/02/2024 09:55-10:10	Total Hydrocarbon	THC Analyzer / FID	< 0.10	5.06	-
Panel 6	23/02/2024 23/02/2024	Total Hydrocarbon	THC Analyzer / FID	< 0.10	5.93	-

Analyst By :

Sudaporn S.

(Miss Sudaporn Soonthorn)

Approved By :

Mairisa Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

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3. ND = non-detectable.

4. - No Standard.



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

ANALYSIS/TEST REPORT

Customer	: EED/SECOT Co., Ltd.	Request Service No.	: 0947/67
For	: PTT Global Chemical Public Co., Ltd, Branch 6 (Refinery GC6)	Sampling Date	: 13-14, 16-17, 20/05/2024
Address	: No.8, I-8 Road, Map Ta Phut Industrial Estate, Map Ta Phut, Mueang Rayong, Rayong Province 21150	Received Date	: 18, 20, 23/05/2024
Tel/Fax	: 0-3897-1000 / -	Test Date	: 20, 28/05/2024
		Report Date	: 30/05/2024

SAMPLE DESCRIPTION / SAMPLING INFORMATION

Sample Designated As	: Workplace Air	Sampling Method	: Sampling Bag
Sampling By	: SECOT Co., Ltd.	Sample Condition	: Normal

Sampling Location	Sampling Date/Time	Compound	Analytical Method	ND ppm	RESULT ppm	STANDARD ppm
Panel 1	13/05/2024 10:14-10:29	Total Hydrocarbon	THC Analyzer / FID	< 0.10	3.32	-
Panel 2	14/05/2024 09:00-09:15	Total Hydrocarbon	THC Analyzer / FID	< 0.10	6.36	-
Panel 4	17/05/2024 10:20-10:35	Total Hydrocarbon	THC Analyzer / FID	< 0.10	5.87	-
Panel 5	20/05/2024 09:00-09:15	Total Hydrocarbon	THC Analyzer / FID	< 0.10	5.07	-
Panel 6	16/05/2024 09:10-09:25	Total Hydrocarbon	THC Analyzer / FID	< 0.10	9.97	-

Analyst By :

Sudaporn S.

(Miss Sudaporn Soonthorn)

Approved By :

Mairisa Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

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

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

3. ND = non-detectable.

4. - No Standard.

ภาคผนวก จ

ใบแสดงการตรวจเทียบเครื่องมือ



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

3. Departure from Nominal Value :

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 : Pornapa Budthum

(Miss Pornapa Budthum)

Testing Officer

Date : 25/05/2024Approved By : Narisa Poowasanpetch

(Miss Narisa Poowasanpetch)

Chief of Technical Management

Date : 25/05/2024

Issued Date : May 25, 2024



Calibration Certificate

Nomenclature : Brand : Sartorius Type : Top-Loading Electronic Balance

Model : BSA224S-CW Serial No. : 32191636

Submitted by : Laboratory of SECOT CO., LTD.

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

Calibration range : 0 - 200 g Scale division : 0.0001 g (220 g)

Calibration date : May 22, 2023

Reference Standard No. M2402083S, M2302167S, M2403062N, M2303005N

Traceable to : Thai Calibration services Co., Ltd

Ambient Condition : Temperature 23.41-24.71 °C

Humidity 48.2-53.1 % RH

Calibrated By : Khemchuda Insorn

(Miss Khemchuda Insorn)

Testing Officer

Date : 23/05/2024Approved By : Narisa Poowasanpetch

(Miss Narisa Poowasanpetch)

Chief of Technical Management

Date : 23/05/2024

Issued Date : May 23, 2024

Measurement Report

Request Service No.100/67

Page 2 of 3

Description : Brand : Sartorius

Type : Top-Loading Electronic Balance

Model : BSA224S-CW

Serial No. : 32191636

Calibration range : 0 – 200 g

Scale division : 0.0001 g (220 g)

Calibration date : May 22,2023

Ambient Condition : Temperature 23.41-24.71 °C Relative humidity 48.2-53.1 % RH

Measurement data :

1. Repeatability of Reading :

Load (g)	Standard Deviation of Reading (g)	Maximum Difference between Successive Reading (g)
50	0.00007	0.0002
100	0.00005	0.0001
150	0.00005	0.0001
200	0.00005	0.0001

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
49.99990	49.99992	49.99988	49.99992	49.99990	49.99992	0.00004

Issued Date : May 24,2024

Request Service No. 100/67

Page 3 of 3

3. Departure from Nominal Value :

Reading (g)	Correction (g)	Uncertainty (+/- g)
0	0.00000	± 0.00007
1	+ 0.00003	± 0.00007
5	+ 0.00004	± 0.00008
10	+ 0.00008	± 0.00008
20	+ 0.00003	± 0.00009
40	+ 0.00012	± 0.00010
60	+ 0.00004	± 0.00012
80	+ 0.00005	± 0.00013
100	+ 0.00006	± 0.00016
120	+ 0.00007	± 0.00018
140	+ 0.00008	± 0.00020
160	+ 0.00006	± 0.00022
180	+ 0.00007	± 0.00024
200	+ 0.00010	± 0.00027

Calibrated by :

Khemchuda Insorn

Approved By :

Narisa Poowasanpetch

(Miss Khemchuda Insorn)

(Miss Narisa Poowasanpetch)

Testing Officer

Chief of Technical Management

Date :

23/05/2024

Date :

23/05/2024

Issued Date : May 23,2024



Request Service No. 101/67

Page 1 of 3

Calibration Certificate

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

Model : AB204-S Serial No. : 1123163292 (209359)

Submitted by : Laboratory of SECOT CO., LTD.

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

Calibration range : 0 – 200 g Scale division : 0.0001 g (220 g)

Calibration date : May 24, 2024

Reference Standard No. M2402083S, M2302167S, M2403062N, M2303005N

Traceable to : THAI CALIBRATION SERVICES CO., LTD.

Ambient Condition : Temperature 24.21 – 24.41 °C

Humidity 41.8 – 49.5 % RH

Calibrated By : Janisla Kui-on Approved By : Narisa Poowasanpeth

(Miss Janista Kui-on)

(Miss Narisa Poowasanpeth)

Testing Officer

Chief of Technical Management

Date : 24 / 05 / 2024

Date : 24 / 05 / 2024

Issued Date : May 24, 2024

Measurement Report

Request Service No. 101/67

Page 2 of 3

Description : Brand : Mettler Toledo

Type : Top-Loading Electronic Balance

Model : AB204-S

Serial No. : 1123163292 (209359)

Calibration range : 0 – 200 g

Scale division : 0.0001 g (220 g)

Calibration date : May 24, 2024

Ambient Condition : Temperature 24.21-24.41 °C Relative humidity 41.8-49.5 % RH

Measurement data :

1. Repeatability of Reading :

Load (g)	Standard Deviation of Reading (g)	Maximum Difference between Successive Reading (g)
50	0.00005	0.0001
100	0.00004	0.0001
150	0.00007	0.0002
200	0.00007	0.0002

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
50.00016	50.00016	50.00028	50.00014	50.00010	50.00012	0.00016

Issued Date : May 24, 2024

Request Service No.101/67

Page 3 of 3

3. Departure from Nominal Value :

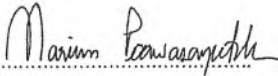
Reading (g)	Correction (g)	Uncertainty (+/- g)
0	0.00000	± 0.00007
1	+0.00003	± 0.00007
5	+0.00002	± 0.00008
10	-0.00004	± 0.00008
20	-0.00003	± 0.00009
40	-0.00002	± 0.00010
60	-0.00016	± 0.00012
80	-0.00021	± 0.00014
100	-0.00020	± 0.00016
120	-0.00023	± 0.00018
140	-0.00030	± 0.00020
160	-0.00034	± 0.00022
180	-0.00037	± 0.00024
200	-0.00022	± 0.00027

Calibrated by : Janista Kui-on

(Miss Janista Kui-on)

Testing Officer

Date : 24/05/2024

Approved By : 

(Miss Narisa Poowasanpetch)

Chief of Technical Management

Date : 24/05/2024

Issued Date : May 24, 2024

Calibration Certificate

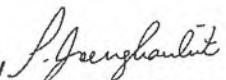
Certificate No.: 2402881-002-01
Client name: SECOT CO., LTD.
Address: 239 Rimklongprapa Road, Bangsue,
 Bangsue, Bangkok 10800

Page 1 of 3

Equipment: CHAMBER (Hot Air Oven)
Manufacturer: MEMMERT
Model: 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

Date of Issue: 30 May 2024

Approved by 
 (Miss Preeyaporn Jaengkarnkit)

Vice President, Department of Laboratory Services
 Responsible for the Technical Management Team

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

ข้อมูลการสอบเทียบฉบับนี้ใช้ได้เฉพาะการสอบเทียบเท่านั้น ไม่สามารถนำไปใช้เพื่อวัตถุประสงค์อื่นใด
 ข้อมูลการสอบเทียบฉบับนี้ใช้ได้เฉพาะการสอบเทียบเท่านั้น ไม่สามารถนำไปใช้เพื่อวัตถุประสงค์อื่นใด
 ข้อมูลการสอบเทียบฉบับนี้ใช้ได้เฉพาะการสอบเทียบเท่านั้น ไม่สามารถนำไปใช้เพื่อวัตถุประสงค์อื่นใด



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		

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:

1. 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#201-209/ RTD#201-209			

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

UUC Description :

Time of Record 1 Hour 9 Minute At 150 °C

Fresh air Damper	-	Open	Position	-
	X	Close	Fan	-
	-	Not Available		

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

F-C5-012 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			

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

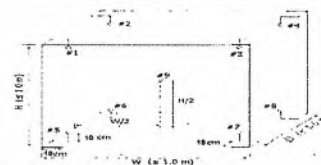


Table 2 : Reporting of Characterization Result

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 *****

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



CAL

Calibratech Co.,Ltd.

7/106-7 Moo 2, Sukhaphrachasan 3 Rd., Bangpood, Pakkred, Nonthaburi 11120

Tel.(02) 964-6211 Fax.(02) 964-5155, e-mail : calibratech.cal@yahoo.com, calibratech.cal@hotmail.com



NSG-TISI-TIS17025
CALIBRATION 0030

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 Samchusri

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	Traceability
400002	TT-0074-22	20 Jun 2024	National Institute of Metrology Thailand (NIMT)

2. Standard Digital Thermometer

ID No.	Cert. No.	Due Date	Traceability
400003	23E1866	01 Jun 2025	National Institute of Metrology Thailand (NIMT)
400004	23E1866	01 Jun 2025	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.



CAL-F0031-03

CAL

Calibratech Co.,Ltd.

7/106-7 Moo 2, Sukhaphrachasan 3 Rd., Bangpood, Pakkred, Nonthaburi 11120

Tel.(02) 964-6211 Fax.(02) 964-5155, e-mail : calibratech.cal@yahoo.com, calibratech.cal@hotmail.com

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%

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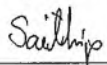
CAL-F0031-03



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3 : EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-3000 FAX. 0-2719-9484

Cert.No.: 23TW242
Page.: 1 of 2

Certificate of Testing

Equipment : DO Meter
Manufacturer : Hanna
Model : HI98193
Serial No. : 06110066101
ID No. : DO No.9
Received Date : 14 November 2023
Test Date : 15 November 2023
Reference : 2311-0451DN-1
Submitted by : Secot Co.,Ltd.
239 Rimklongprapa Road,
Bangsue, Bangkok 10800
Laboratory Condition : Temperature (25 ± 5) °C
Humidity (50 ± 20) %
Test Procedure : In - house method : CP-CH9
by Comparison Technique with Azide Modification Method
Tested by : Walalak Sirithean
Approved by : 
Approved Signatory
(✓) Saitthip Meangmai
() Warakorn Lerngagtrakul
() Ponpan Palpim
Issue Date : 16 November 2023



Cert.No.: 23TW242
Page.: 2 of 2

Condition of this result of calibration

1. Reference Standard Instruments :

This certification is traceable to the International System of Unit through the reference standards laboratory of Industrial Calibration Center, Technology Promotion Association (Thailand-Japan).

Instruments	Serial No.	ID No.	Certificate No.	Due Date
1) Burette	-	130BU10	23CG1172	22 Mar 2025
2) Balance	1124013382	140RC006	23MM18	20 Feb 2024

2. Standard Material :-

Material	Manufacturer	Lot.No.	Assay
Sodium Thiosulfate pentahydrate	Merck	AM1763316	100.2%

Result : Dissolved Oxygen Meter Adjustment With Air 100 %
Dissolved Oxygen Probe No.: KC1N2993N

Titration Method (Azide Modification Method) (mg/L)	DO Meter Reading (mg/L)	Standard Deviation (mg/L)
8.18	8.17	0.0055

This report was certified only for the instrument we tested. It is allowable to use for study the system efficiency, The environmental impact control and present to organization it may concerned Intend to use for advertising and referral purpose is prohibited. This report may not be reproduced other in full, without written approval of the laboratory

-o0o-



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-3000-29 FAX. 0-2719-9484



Cert.No.: 23CH1456

Page.: 2 of 2

Certificate of Calibration

Cert.No.: 23CH1456

Page.: 1 of 2

Equipment : Conductivity Meter
Manufacturer : Hanna
Model : HI98192
Serial No. : 05200045101
ID No. : Conduct No.8
Condition As-Received: Used Item
Received Date : 14 November 2023
Calibration Date : 15 November 2023
Reference : 2311-0451DN-2
Submitted by : Secot Co.,Ltd.
239 Rimklongprapa Road,
Bangsue, Bangkok 10800
Ambient Temperature : (25 ± 2.5) °C
Relative Humidity : (50 ± 15) %
Calibration Procedure: In-house method :
- CP-CH6 : based on direct measurement by
using certified reference material (CRM)

Calibrated by : Walalak Sirirthean

Approved by :

(✓) Salthip Meangmai
() Warakorn Lerngagrakul
() Ponpan Palpim

Issue Date : 16 November 2023

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 head of Corporate Services 3 : Equipment Calibration and Testing Services.

Condition of this result of calibration

1. Reference Standard Instrument :-

Instrument	Serial No.	ID No.	Certificate No.	Due date
1) Thermometer	9549224	130RC003	231435	10 Apr 2024

- This Certification is traceable to SI Through Technology Promotion Association (Thailand - Japan)

2. Certified Reference Materials :-

- Conductivity calibration solution, CPA chem Ltd., The measurement results are traceable to SI through CPA chem Ltd., ANSI-ASQ National Accreditation Board, Accredited No. AR-1835
- Conductivity calibration solution, Thermo Scientific (traceable to NIST)

Conductivity Solution	Manufacturer	Lot No.	Exp. date
*100 µS/cm	Thermo Scientific	193/01	11 May 2024
1.413 mS/cm	CPA Chem	913596	14 July 2024
12.880 mS/cm	CPA Chem	913597	14 July 2024

- Control Conductivity calibration solution temperature by Water bath (25±0.1) °C

3. This certificate is valid only to the item calibrated on date and place of calibration.

Calibration results

Function : Conductivity Measurement

(*) After Adjustment at 1.413, 12.880 mS/cm
Conductivity Electrode Serial No.: 0932016N

Standard Conductivity Solution	Before Adjustment UUC* Reading	After Adjustment UUC* Reading	Uncertainty of Measurement (±)	Coverage factor k
*100 µS/cm	97.60 µS/cm	104.8 µS/cm	5.1 µS/cm	2.00
1.413 mS/cm	1.285 mS/cm	1.413 mS/cm	0.0092 mS/cm	2.00
12.880 mS/cm	12.15 mS/cm	12.88 mS/cm	0.086 mS/cm	2.00

Remark - UUC* = Unit Under Calibration
- * = Not NSC - ONSC Accredited

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

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
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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL.0-2717-3000-29 FAX.0-2719-9484

Certificate of Calibration

Cert.No.: 24CH511
Page.: 1 of 2

Equipment : Turbidity Meter
Manufacturer : HANNA
Model : HI 98703
Serial No. : 03090023991
ID. No. : -
Condition As-Received: Used item
Received Date : 30 April 2024
Calibration Date : 03 May 2024
Reference : 2404-0712DN-2
Submitted by : Secot Co.,Ltd.
239 Rimklongprapa Road,
Bangsue, Bangkok 10800
Ambient Temperature : (25 ± 2.5) °C
Relative Humidity : (50 ± 20) %
Calibration Procedure : In - house method : CP-CH11
Direct measurement by
using Formazin standard solution
Calibrated by : Walalak Sirithean
Approved by : 
Approved Signatory
() Unnopphol Harachai
() Ponpan Paipim
(✓) Saithip Meangmai
Issue Date : 6 May 2024

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 head of Calibration and Testing Equipment Services.



Cert.No. : 24CH511
Page. : 2 of 2

Condition of this calibration result

1. Reference Standard Instruments :

This certification is traceable to the International System of unit (SI unit) through:-
- Technology Promotion Association (Thailand-Japan).

Instruments	Serial No.	ID No.	Certificate No.	Due date
1) Thermo-Hygrograph	1103328	130EC010	23H1361	13 June 2024
2) Electronic Balance	14233821	110RC001	23MM405	16 July 2024

2. Standard Material : The Formazin suspension has been prepared gravimetric from

Material	Manufacturer	Lot No.	Assay
1) Hexamethylenetetramine	HIMEDIA	0000493947	99.65%
2) Hydrazinium Sulfate	HIMEDIA	0000522014	99.40%

3. This certificate is valid only to the item calibrated on date and place of calibration.

Calibration result

Performing four - Formazin suspension standard curve by using 0,20,100,800 NTU

Turbidity Meter Serial Number : 03090023991

Standard Formazine suspension (NTU)	UUC* Reading (NTU)	Uncertainty of Measurement (± NTU)	Coverage Factor k
20	19.9	0.38	2.00
40	40.3	0.40	2.00
100	100	0.70	2.00
400	397	1.5	2.09

Remark - UUC* = Unit Under Calibration
- NTU = Nephelometric Turbidity Units

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

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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3 : EQUIPMENT CALIBRATION AND TESTING SERVICES

534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250

TEL. 0-2717-3000-29 FAX. 0-2719-9484

Certificate of Calibration

Cert.No.: 23CH656

Page.: 1 of 2

Equipment : Turbidity Meter
Manufacturer : HANNA
Model : HI 98703
Serial No. : 03090023991
ID. No. : -
Condition As-Received: Used Item
Received Date : 19 May 2023
Calibration Date : 23 May 2023
Reference : 2305-0663DN-1
Submitted by : Secot Co.,Ltd.
239 Rimklongprapa Road,
Bangsue, Bangkok 10800
Ambient Temperature : (25 ± 2.5) °C
Relative Humidity : (50 ± 20) %
Calibration Procedure : In - house method : CP-CH11
based on direct measurement by
using Formazin standard solution
Calibrated by : Walalak Sirithean
Approved by : 
Approved Signatory
() Malee Butkruea
(✓) Salthip Meangmai
() Warakorn Lerngagtrakul
Issue Date : 25 May 2023

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 head of Calibration and Testing Equipment Services.



Cert.No.: 23CH656

Page.: 2 of 2

Condition of this calibration result

1. Reference Standard Instruments :

This certification is traceable to the International System of unit (SI unit) through
Technology Promotion Association (Thailand-Japan).

Instruments	Serial No.	ID No.	Certificate No.	Due date
1) Thermo-Hygrograph	1103328	130EC010	22H1313	12 June 2023
2) Electronic Balance	N03679	140RC001	22MM49	20 Sep 2023

2. Standard Material : The Formazin suspension has been prepared gravimetric from

Material	Manufacturer	Lot No.	Assay
1) Hexamethylenetetramine	HIMEDIA	0000493947	99.65%
2) Hydrazinium Sulfate	HIMEDIA	0000522014	99.40%

3. This certificate is valid only to the item calibrated on date and place of calibration.

Calibration result

Performing four - Formazin suspension standard curve by using 0,20,100,800 NTU
Turbidity Meter Serial Number : 03090023991

Standard Formazine suspension (NTU)	UUC* Reading (NTU)	Uncertainty of Measurement (± NTU)	Coverage Factor k
20	19.9	0.39	2.00
40	39.5	0.40	2.00
100	99.4	0.71	2.00
400	396	1.5	2.05

Remark - UUC* = Unit Under Calibration
- NTU = Nephelometric Turbidity Units

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

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Calibration Certificate

Certificate No.: 2304081-001-01
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.: 2304081
Operation No.: 2304081-001
Date of Receipt: 27 July 2023
Date of Calibration: 27 July 2023

Calibrated by Mr. Worapob Sooktong
Scientist

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

Date of Issue: 7 August 2023

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.: 2304081-001-01
Equipment: CHAMBER (Incubator)
Model: ICP 400 Serial No.: K406.0004
Resolution: 0.1 °C ID No.: N/A
Manufacturer: MEMMERT

Date of Calibration: 27 July 2023

Page 2 of 3

Location: Laboratory, SECOT CO., LTD.
Environment Condition: Ambient Temperature (30 ± 1) °C
Relative Humidity (54 ± 1) %
Line Voltage (228 ± 0) 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.
- Reference Standard Instrument :

Instrument	Model	Serial No./ID No.	Certificate No.	Due Date	Through
Digital Thermometer with sensor	34972A	MY49016894	TE 660380-01	22 April 2024	NATIONAL FOOD INSTITUTE
	RTD	CH#301-309/ RTD#301-309			

- 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 -
X Close
- Not Available

- Result of Calibration : ☒ Without adjustment ☐ After adjustment

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

Handwritten signature/initials.



Calibration Report

Certificate No.: 2304081-001-01
Equipment: CHAMBER (Incubator)
Model: ICP 400 Serial No.: K406.0004
Resolution: 0.1 °C ID No.: N/A
Manufacturer: MEMMERT

Date of Calibration: 27 July 2023

Page 3 of 3

Calibration point: 20.0 °C

Calibration result:

Calibration Condition	Temperature (°C)	Relative Humidity (%)	Line Voltage (Volt)
MIN	28.6	53.0	227.3
MAX	31.4	54.1	228.1

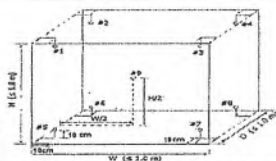


Table 1 : Reporting of Temperature

Calibration point (°C)	Measured Temperature (°C) @ Sensor No. (Sensor No.9 is REF)									Uncertainty ± (°C)
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	
20.0	20.42	20.39	20.40	20.43	20.47	20.49	20.42	20.41	20.43	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	20.1	20.0	0.065	0.053	0.220

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.: 2304081-002-01
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.: 2304081

Operation No.: 2304081-002

Date of Receipt: 27 July 2023

Date of Calibration: 27 July 2023

Calibrated by Mr.Worapob Sooktong
Scientist

Approved by 
(Mr.Pheraphat Tuanjit)

Manager, Division of Calibration Laboratory
Responsible for the Technical Management Team

Date of Issue: 7 August 2023

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.: 2304081-002-01
Equipment: Water Bath
Model: WB 29 Serial No.: I698.0051
Resolution: 0.1 °C ID No.: N/A
Manufacturer: MEMMERT
Date of Calibration: 27 July 2023 Page 2 of 3

Location: Laboratory, SECOT CO., LTD.
Environment Condition: Ambient Temperature (24 ± 1) °C
Relative Humidity (58 ± 2) %
Line Voltage (229 ± 1) Volt

Condition of this results of Calibration:

1. 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 (2016): 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	MY49016894	TE 660380-01	22 April 2024	NATIONAL FOOD INSTITUTE
	RTD	RTD#201-205 / CH#201-205			

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

UUC Description:

Time of Record 1 Hour 9 Minute At 95.0 °C

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

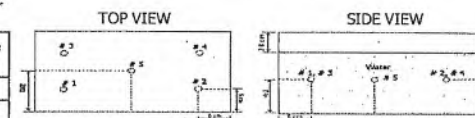
Calibration Report

Certificate No.: 2304081-002-01
Equipment: Water Bath
Model: WB 29 Serial No.: I698.0051
Resolution: 0.1 °C ID No.: N/A
Manufacturer: MEMMERT
Date of Calibration: 27 July 2023 Page 3 of 3

Calibration point: 95.0 °C

Calibration result:

Calibration Condition	Temperature (°C)	Relative Humidity (%)	Line Voltage (Volt)
Min	23.0	56.3	227.5
Max	25.0	60.2	229.6



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	95.03	94.96	95.10	94.97	95.02	0.28

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	0.18	0.080	0.47

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 -----



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	Syngistix 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 ₀ Results	≤ 7.0 pg/0.0044 A-s	4.90	Passed
Precision	≤ 2.0 %	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 m _g Result	≤ 16.5 pg/0.0044 A-s	14.20	Passed
Zeeman Ratio	0.52 ± 0.04	0.5430	Passed


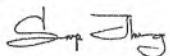
10. Review:

- ☒ 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	
$\text{Zeeman Ratio} = \frac{\text{Atomic Signal (Peak area)}}{\text{Atomic Signal (Peak area)} + \text{Background Signal (Peak area)}}$	
	$= \frac{0.1545}{0.1545 + 0.1300}$
	$= 0.5430$

Review

The preventive maintenance checks and if applicable performance tests for PinAAcle 900T have been completed.	
This PinAAcle 900T <input checked="" type="checkbox"/> 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)

Agilent CrossLab Start Up Services

Agilent 7890 Gas Chromatograph

Preventive Maintenance Checklist

Agilent Preventive Maintenance provides factory recommended service for your analytical instruments to assure reliable operation and the accuracy of your results.

Delivered by highly trained and certified service engineers using genuine Agilent parts and supplies, Agilent Preventive Maintenance provides everything you need to reduce unplanned downtime and keep your systems operating at their peak. This checklist will be completed at the end of the service and provided to you as a record of the preventive maintenance activities.

Introduction

Customer Information

- Customers should provide all necessary operating supplies upon request of the engineer.
- A customer representative should be available to the engineer while performing the preventive maintenance procedures.
- Any parts, not included in the Parts Lists section of this document, are not part of the recommended Preventive Maintenance service, nor are they included in the price of this service.
- If a system requires the use of extra or special procedures and/or parts for the maintenance service, then these must be ordered separately and charged as a repair, which may incur additional costs.

Important Customer Web Links

- For more information about **Agilent Technologies services**, please visit our website using the following URL: <http://www.agilent.com/en-us/products/crosslab-instrument-services/service-repair>
- The **Agilent Community** is an excellent place to get answers, collaborate with others about applications and Agilent products, and find in-depth documents and videos relevant to Agilent technologies. Visit <https://community.agilent.com/welcome>.
- To access **Agilent University**, visit <http://www.agilent.com/crosslab/university/> to learn about training options, which include online, classroom and onsite delivery. A training specialist can work directly with you to help determine your best options.
- A useful **Agilent Resource Center** web page is available, which includes short videos on maintenance, quick lists of consumables for new instruments, and other valuable information. Check out the Resource Page here: <https://www.agilent.com/en-us/agilentresources>.
- Need technical support, FAQs, supplies? – visit our **Support Home page** <http://www.agilent.com/search/support>.
- **Videos** about specific preparation requirements for your instrument can be found by searching the **Agilent YouTube** channel at <https://www.youtube.com/user/agilent>.
- **7890B Manuals** are also available on Agilent.com:
 - **Safety**
https://www.agilent.com/cs/library/usermanuals/public/7890B_Safety.pdf
 - **Installation and First Startup**
https://www.agilent.com/cs/library/usermanuals/Public/7890B_Installation.pdf
 - **Operation Manual**
https://www.agilent.com/cs/library/usermanuals/Public/7890B_Operation.pdf
 - **Maintaining Your GC**
https://www.agilent.com/cs/library/usermanuals/public/G3430-90052%207890B_Maintaining%20Guide.pdf

Service Engineer's Responsibilities

- Contact the customer and ensure that all necessary supplies are available before the preventive maintenance visit.
- Only select those pages that relate to the system or module being serviced.
- Complete empty fields with the relevant information.
- Complete the relevant checkboxes in the checklist using either a "X" or tick mark "✓".
- Check "Section not applicable" check boxes to indicate services/tasks not delivered, as appropriate.
- Complete the Preventive Maintenance service in the order of the tasks listed.
- Complete the Service Review section together with the customer.
- Complete the fields for page numbers at the foot of each selected page
- Complete the total number of pages field in the Service Completion section
- **Ask the customer to sign the Service Completion section including the customer's and your signature.**

Additional Instruction Notes

- Check for any active service notes for this unit. If there are any applicable "Safety" or "Modification Recommended" Service notes, plan to implement the changes on this unit before doing any qualification service.
- Do not implement firmware updates, unless you get approval from the customer and are sure that they are compatible with the instrument control software.

System Information

- ☐ Check this box if an instrument configuration report is attached instead of completing the table below.

Instrument System Name and ID	7890A GC System
Instrument System Site and Location	SECOT CO., LTD.

List System Component Product Numbers	List the Serial Numbers of each Component
1. G3440B	CN15343147
2. G4513A	CN11350133
3. G4514A	CN13080006
4. N/A	N/A
5. N/A	N/A
6. N/A	N/A
7. N/A	N/A
8. N/A	N/A
9. N/A	N/A
10. N/A	N/A

Preparation

- ☒ Discuss any specific issues with the customer before starting.
- ☒ Review the instrument logbook for recorded problems and comments.
- ☒ Save instrument control settings before starting the procedure.
- ☒ Perform a general inspection of the system for cleanliness.
- ☒ Check for proper installation of parts, assemblies, sensors etc.
- ☒ Check system for required installation of components, settings as defined by current Service Notes.
- ☒ Check for required firmware updates and verify with customers if they would like them installed.
- ☐ Before starting the following procedures, record the Detector Signal Output(s) in the results table. If the GC is turned OFF or in a service mode, comparing the detector outputs before and after the service is not possible.

Preventive Maintenance Procedure

Clean and inspect GC

- ☒ Unplug power cord from the power source.
- ☒ Open GC covers and vacuum/remove any dust/debris. Pay particular attention to cooling fans.
- ☒ Inspect internal connectors for proper contact and placement.
- ☒ Reconnect Power to the GC. Power the GC on and verify the power on self-test passed.
- ☒ Verify oven motor spins freely and turns on with the oven door closed; off when the door is opened.
- ☒ Verify operation of all other fans - the inlet and EPC cooling fans.
- ☒ Verify oven intake/outlet flap assembly is operating smoothly while heating and cooling the oven

Inlet and detector consumable replacement

- ☒ For the inlets installed, perform inlet maintenance as defined in the 7890 manual – "Maintaining Your GC" - for the inlet(s) installed.
- ☒ Replace the split vent trap cartridge filter on units with these inlets: Split/Splitless Capillary (SSL), Multi-Mode Inlet (MMI), Programmed Temperature Vaporizer (PTV), Volatiles Interface (VI).
- ☒ If the inlet system is used in Split Mode with viscous samples, inspect and clean the split vent tube on the inlet and flush or replace the tubing between the inlet and the split vent trap.
- ☒ If the GC includes a Flame Ionization Detector (FID), replace the jet. If the ignitor shows any buildup of sample or corrosion, replace the ignitor. Examine the FID collector and castle assemblies for contamination – clean as necessary.

Zero Sensors and Leak test

- ☒ Zero all pressure sensors per the procedure in the 7890 "Advanced User Guide".
- ☒ Perform inlet pressure decay test(s) as defined in the 7890 "Troubleshooting Manual".
If the PM is done in preparation for an Operational Qualification, then the pressure decay test defined within that protocol can be used for the PM.
- ☒ Record if test passed or failed in the results table.

ALS Maintenance

- ☐ Section NOT applicable
- ☒ Check all cabling and configuration settings between GC, tray, and injectors.
- ☒ Vacuum or remove any dust, especially around fans.
- ☒ Check operation of all fans.
- ☒ Check syringe for smooth plunger operation.
- ☒ Check for smooth operation of the needle support – clean if necessary

Restore Instrument

- ☒ Restore the normal operating conditions or customer method using the Data System.
- ☒ Purge the system with carrier flow for 15 minutes
- ☒ Bake out the system, then restore the normal operating conditions
- ☒ After equilibration, check and record the post PM detector signal output values.
Results should be similar or lower than the detector outputs recorded prior to PM.
- ☒ Perform a chemical checkout. If this is a routine PM, inject the customer's sample using the ALS if applicable. This will act as a final checkout of both the ALS and the GC.

Note: If the PM Service is performed prior to a qualification service, then use the qualification procedure as a guide for final instrument set up and checkout.

Signature Page

Service Review

- ☒ Attach available reports/printouts of all tests to this documentation.
- ☒ Record the Preventive Maintenance service activity in the customer's records/logbook.
- ☒ Update/reset instrument maintenance counters as appropriate.
- ☒ Affix the PM sticker to the system or instrument logbook based on the customer's request.
- ☒ Complete the Service Engineer Comments section if there are additional comments.
- ☒ Review with the customer this service, parts replaced, and test results obtained.
- ☐ If the instrument firmware was updated, record the details of the change in the Service Engineer's Comments box or if necessary, in the customer's IQ records.
- ☐ Supply the customer with a copy of the Smart Alerts flyer.
- ☐ Describe Smart Alerts to the customer.
- ☐ Install Smart Alerts if requested.

7890 GC Test Results Table

Detector Signal Outputs	Before PM Service	After PM Service
Front detector output uECD	-	180
Back detector output FID	-	15
AUX detector output	N/A	N/A
Pressure decay test	Expected test result	Actual test result
Front inlet pressure decay test	Pass	Pass
Back inlet pressure decay test	Pass	Pass

7890 Parts List Table

The following kits are recommended for capillary and purged packed inlets. If this is a general PM and the customer has a preferred set of consumables, you may use the customer's consumables.

Part description	Part number	Product or model# where used	Quantity consumed
SSL Capillary Inlet PM kit, Splitless	5188-6497	7890A/B	2
SSL Capillary Inlet PM kit, split	5188-6496	7890A/B	N/A
SSL Capillary Ultra Inert Inlet Gold Seal with Washer	5190-6144	7890A/B	N/A
SSL Capillary Ultra Inert Inlet Splitless Liner - Single taper with Glass Wool	5190-2293	7890A/B	N/A
SSL Capillary Ultra Inert Inlet Low Pressure Drop Split Liner - with Glass Wool	5190-2295	7890A/B	N/A
PP Inlet PM kit	5188-6498	7890A/B	N/A
Split vent trap PM kit, single cartridge (for MMI, PTV & VI)	5188-6495	7890A/B	N/A
MMI Cleaning Kit	G3510-60820	7890A/B	N/A
PTV Septumless Head Rebuild Kit	5182-9747	7890A/B	N/A
PTV Septumless Head Teflon Guide	5182-9748	7890A/B	N/A
Ignitor (glow plug) assembly with O-ring	19231-60680	7890A/B	1
FID Collector Rebuild/Cleaning Kit	G1531-67000	7890A/B	N/A
Standard .011-inch FID Jet for capillary FID base	G1531-80560	7890A/B	N/A
High Temperature .018-inch FID Jet for capillary FID base	G1531-80620	7890A/B	N/A
Standard .018-inch FID Jet for packed column with packed FID base	18710-20119	7890A/B	N/A
Standard .011-inch FID Jet for capillary column with packed/adaptable FID base	19244-80560	7890A/B	N/A
High Temperature .018-inch FID Jet for capillary column with packed/adaptable FID base	19244-80620	7890A/B	N/A
NPD Jet, universal fit, .011-inch ID	G1534-80580	7890A/B	N/A
NPD Jet, universal fit, .011-inch ID Extended tip	G1534-80590	7890A/B	N/A
SSL Capillary Ultra Inert Inlet Gold Seal with Washer	5190-6144	7890A/B	N/A
SSL Capillary Ultra Inert Inlet Splitless Liner - Single taper with Glass Wool	5190-2293	7890A/B	N/A
**FID Collector Replacement Kit, if needed	G1531-67001	7890A/B	N/A

Service Engineer Comments

If there are any specific points you wish to note as part of performing the service or other items of interest for the customer, please write include them in this box.

N/A

Service Completion

Service request number 6006786001 Date service completed 23 May 2024
 Agilent signature [Signature] Customer signature [Signature]
 Total number of pages in this document 10

Do not include this section/page in the published, customer-facing PDF version.

This page is only relevant for Agilent source documents for document control purposes and is NOT intended for customer viewing. Refer to the SPIFPM checklist Authoring Guide for more information.

Document Control Logs

Revision Log

Revision	Date	Author	Reason for update
Revision of document	Date of Issuance	Author of document	Author to describe main features/changes made for this specific revision
1.0 Draft	4-Mar-2011	Dave Park	Migrated the content of revision A.01.05 to the new Agilent template. Reviewed by subject matter expert, Dave Park.
1.1 Draft	20-Jan-2015	Dave Park	Added Split Vent trap to MMI, PTV and VE - also PTV and FID PM Parts
1.2 Draft	31-March-2015	Dave Park	Added Ultra Inert Gold Seal and Liner to SS Consumables
A.01.11	10-Dec-2015	Dave Park	Added step to perform maintenance on the Split Vent Tube and .018" FID Jet part numbers - Fixed broken web links
2.00	30-Dec-2020	Gary Boardman	Updated New Template and terminology change: Familiarization to Introduction. Create New Agile Document Number: D0007063

Approval Log

Revision	Approver	Title of approver
Add revision number	Add approver name here	Add approver's function or title here
A.01.06	Don Gage	Product support manager
A.01.09	Kai Meng	Product support manager
A.01.10	Suneetha Tippireddy	Product support manager
A.01.11	Suneetha Tippireddy	Product support manager
2.00	Josh Roark	GC Product Support Manager

Designated Evaluation Log

Revision	Designated Evaluator (DE)	Title of DE	DE Number
Add revision number	Add name	Add function or title	Add DE number here
2.00	Michael Zumwalt	CrossLab Start Up Services Application Consulting Lead	44166.759722222

Agilent CrossLab Start Up Services

Agilent GCMS Preventive Maintenance Checklist



Agilent Preventive Maintenance provides factory recommended service for your analytical instruments to assure reliable operation and the accuracy of your results.

Delivered by highly trained and certified service engineers using genuine Agilent parts and supplies, Agilent Preventive Maintenance provides everything you need to reduce unplanned downtime and keep your systems operating at their peak. This checklist will be completed at the end of the service and provided to you as a record of the preventive maintenance activities.

Introduction

Select the appropriate PM to be done and then perform the checklist under that section

- ☐ Interim Preventive Maintenance 6 months
☒ Major Preventive Maintenance Yearly

This checklist covers the following model(s):

Type	Model
SQ	5973 Series MSD
SQ	5975 Series MSD
SQ	5977 Series MSD
TQ	7000 Series MS/MS
TQ	7010 Series MS/MS
QTOF	7200 Series QTOF
QTOF	7250 Series QTOF

Customer Information

- Customers should provide all necessary operating supplies upon request of the engineer.
- A customer representative should be available to the engineer while performing the preventive maintenance procedures. Customers are responsible for regular maintenance and are encouraged to observe the service representative.
- Any parts not included in the Parts Lists section of this document are not part of the recommended Preventive Maintenance service nor are they included in the price of this service.
- If a system requires the use of extra or special procedures and/or parts for the maintenance service, then these must be ordered separately and charged as a repair, which may incur additional costs.

Important Customer Web Links

- For more information about Agilent Technologies services, please visit our website using the following URL: <http://www.agilent.com/en-us/products/crosslab-instrument-services/service-repair>
- To access Agilent University, visit <http://www.agilent.com/crosslab/university/> to learn about training options, which include online, classroom and onsite delivery. A training specialist can work directly with you to help determine your best options.
- A useful Agilent Resource Center web page is available, which includes short videos on maintenance, quick lists of consumables for new instruments, and other valuable information. Check out the Resource Page here: <https://www.agilent.com/en-us/agilentresources>
- Need technical support, FAQs, supplies? – visit our Support Home page at <http://www.agilent.com/search/support>
- Get answers. Share insights. Build connections: Join the Agilent Community at <https://community.agilent.com/welcome>

Service Engineer's Responsibilities

- Contact the customer and ensure that all necessary supplies are available before the preventive maintenance visit.
- Complete empty fields with the relevant information.
- Complete the relevant checkboxes in the checklist using either a "X" or tick mark "✓".
- Check "Section not applicable" check boxes to indicate services/tasks not delivered, as appropriate.
- Complete the Preventive Maintenance services in the most logical order relevant to the individual system service in the order of the tasks listed.
- Complete the Service Review section together with the customer.
- Ask the customer to sign the Service Completion section including the customer's and your signature.

Additional Instruction Notes

- Preventive maintenance is a factory recommended procedure designed to reduce the likelihood of electromechanical failures. Failure to perform preventive maintenance may reduce the long-term reliability of certain instruments and systems. Two preventative maintenances (PMs) per year are recommended, the Major PM Service will be performed annually with an Interim PM performed 6 months after the Major PM.

System Information

- ☐ Check this box if an instrument configuration report is attached instead of completing the table.

Instrument System Name and ID	5975C MSD
Instrument System Site and Location	SECOT Co., Ltd.

List System Component Product Numbers		List the Serial Numbers of each Component
1.	G3172A	US74838080
2.	N/A	N/A
3.	N/A	N/A
4.	N/A	N/A
5.	N/A	N/A
6.	N/A	N/A
7.	N/A	N/A
8.	N/A	N/A

Preparation

- ☒ Discuss any specific issues with the customer before starting.
- ☒ Review the instrument logbook for recorded problems and comments.
- ☒ Save instrument control settings before starting the procedure.
- ☒ Perform a general inspection of the system for cleanliness.
- ☒ Check for proper installation of parts, assemblies, sensors etc.
- ☒ Check system for required installation of components and settings as defined by current Service Notes
- ☒ Check for firmware updates and verify with customers if they would like them installed. Firmware update(s) are strongly recommended.

Customer Responsibilities

Customers should ensure that all necessary operating supplies, consumables, and usage-dependent items such as gases, vials, syringes, calibrant solution and solvents required for successful preventive maintenance are available. A customer representative should be available while the preventive maintenance is being performed.

Important notice for customers

The customer should complete the following before the Support Provider arrives on site:

- ☒ Perform an autotune and retain the printed tune report just prior to the start of the PM to verify performance of the equipment.

Note: it is recommended to have the customer run the autotune and tune evaluation prior to the PM and then start the vent cycle so that the instrument will be ready for the service representative.

Definition of the Task/Recommended items within the document

Task	Recommended	
Yes	No	Interim / Major / As needed
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Yes selected means that the task was done or the part was required.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> No selected means that the task was not done or the part was not required.
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> Interim selected means that this task is recommended to be done at 6-month intervals.
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> Major selected means that this task is recommended to be done yearly; if the customer would like a service to be done at the 6-month interval then the service could be purchased.
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> As needed selected means that the task was done or the part was used as needed. For example, there could be two types of filters that could be used and this was the one selected.

Preventive Maintenance Procedures

Yes/No	Interim/Major	Description
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Perform general inspection of system for cleanliness
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Discuss any problems the customer is having with the instrument
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Review customer maintenance records and exclude maintenance on recently serviced items
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Review the most recent autotune report. This will give a starting point for evaluating spectral peaks, baseline noise, peak shape, mass assignments and resolution.

Yes/No	Interim/Major	GCMS
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Record Instrument model no.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Record Instrument serial no.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Record Rough Vacuum
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Record Manifold Vacuum
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Type of Column Installed

Yes/No	Interim/Major	System Checks
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Verify that calibration peaks were seen prior to starting the PM
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Vent the instrument
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Inspect vacuum hoses, pump, exhaust tubing, and power cords for excessive wear.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Visually inspect calibrant levels – PFTBA PFOTD (if appl.), IRM (if appl.). Refill if available.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Look for any obvious external damage or problems.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Clean air intake(s). Cosmetic cover(s) may need to be removed.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Verify system line voltage meets instrument specifications: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Yes/No	Interim/Major	Wet Mechanical vacuum pumps
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Check for evidence of oil leakage. Check pump gasket for leakage.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Drain and replace mechanical pump oil.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Replace Oil Mist Filter if applicable.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Discuss with customer the need for more frequent oil changes if the oil is dirty
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Don't use mist filters with Chemical Ionization.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Perform anti-suckback valve test. Power on until side plate is held closed, power off and check that side plate holds closed. Visually confirm that no oil returns up vacuum hose.
Yes/No	Interim/Major	Dry Mechanical vacuum pumps - Diaphragm
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Check for evidence of poor vacuum – Turbo power demand, poor manifold vacuum, etc.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Clear air flow paths of dust.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	If vacuum is poor, then replace the diaphragm pump.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Perform anti-suckback valve test. Power on until side plate is held closed, power off and check that side plate holds closed.

Yes/No	Interim/Major	Dry Mechanical vacuum pumps - Scroll
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Replace the tips seal on the IDP pump.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Check for evidence of poor vacuum – Turbo power demand, poor manifold vacuum, etc.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Replace the Exhaust Filter if required.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Discuss with customer the need for more frequent changes, if needed.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Inform customer that pump gas ballast should be installed all the time.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Perform anti-suckback valve test. Power on until side plate is held closed, power off and check that side plate holds closed.

Yes/No	Interim/Major	Cleaning System and Filters
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Fans
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Remove dust from fans and vent covers.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Verify fans are functional and that there is enough space around the instrument for proper cooling.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Source cleaning
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Open analyzer and remove the source.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Disassemble, Clean, Re-assemble source.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Re-install source and close analyzer.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Filters
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Replace RMSH-2 Helium gas filter – if applicable.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Replace RMSN-2 Nitrogen gas filter – if applicable.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Replace RMSHY-2 Hydrogen gas filter – if applicable.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	CP17988 – Gas Clean Carrier Gas Kit for 7890 for Nitrogen or Helium; Bracket, Mount, and Filter – if applicable.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	CP17974 – Gas Clean Filter Kit GC/MS 1/8", Mount and Filter – if applicable.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	CP17973 – Gas Clean Filter; Replacement Filter – if applicable.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	S190-9071 – Methane Gas Filter – if applicable

Guidance: If gas filter is replaced, write the change date on the filter using a permanent marker.

System post-check				Description
Yes/No	Interim	Major		
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Pump system back down. Wait until system stability has been achieved.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Verify system vacuum reading(s) via the gauge controller.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Leak Check
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Verify system in manual tune
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Compare against previous tune file report(s)
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Change to Tune and verify that all temperatures, pressures, and gas flows reach method set points
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Check manually that you have calibration peaks.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	EI Autotune Performed

Guidance: If the PM Service is performed prior to a qualification service, then use the qualification procedure as a guide for final instrument setup and checkout.

Service Review

- ☒ Attach available reports/printouts of all tests to this documentation.
- ☒ Record the Preventive Maintenance service activity in the customer's records/logbook. Record the PM event in the Smart Alerts logbook, if applicable.
- ☒ Update/reset instrument maintenance counters as appropriate.
- ☒ Affix the PM sticker to the system or instrument logbook based on the customer's request.
- ☒ Complete the Service Engineer Comments section if there are additional comments.
- ☒ Review this service, parts replaced, and test results obtained with the customer.
- ☐ If the instrument firmware was updated, record the details of the change in the Service Engineer's Comment box. Systems in a compliant environment may need additional documentation.

Agilent Test Results Table

Test Description	Expected Test Result	Actual Test Result
Atune and Evaluation	Pass	Pass
N/A	N/A	N/A

Agilent Consumed Parts List Table

☐ Section not applicable

Part Description	Part Number	Product or Model# where used	Quantity consumed
Agilent Vacuum Fluid	5191-5851	Rough Pump	1
N/A	N/A	N/A	N/A

Signature Page

Service Engineer Comments (optional)

If there are any specific points you wish to note as part of performing the installation or other items of interest for the customer, please write in this box:

N/A

Service Completion

Service request number 6006807758 Date service completed 12 Jun 2024

Agilent signature Smryn Th. Customer signature Sirinan C.

Total number of pages in this document 12

Parts – As needed as part of the PM

Common MS Filters and Seals – 5973/5975/5977/7000/7010/7200/7250 Series

Yes/No	Interim/Major/As needed	Description	Part number
<input type="checkbox"/>	<input type="checkbox"/>	Helium gas filter – if required	RMSH-2
<input type="checkbox"/>	<input type="checkbox"/>	Nitrogen gas filter – if required	RMSN-2
<input type="checkbox"/>	<input type="checkbox"/>	Big Universal Trap, 1/8" fittings, Hydrogen, if required	RMSHY-2
<input type="checkbox"/>	<input type="checkbox"/>	Gas Clean Carrier Gas Kit for 7890 for Nitrogen or Helium; Bracket, Mount and Filter – if required	CP17988
<input type="checkbox"/>	<input type="checkbox"/>	Gas Clean Filter Kit GC/MS 1/8 in (complete replacement kit) – if required	CP17974
<input type="checkbox"/>	<input type="checkbox"/>	Gas Clean GS/MS Filter – if required	CP17973
<input type="checkbox"/>	<input type="checkbox"/>	Chemical Ionization Gas Purifier (CI systems) – if required	5190-9071
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Agilent AVF Platinum, 1 quart	5191-5851

Gas filters need to be changed only if required

MS Maintenance Supplies for 5973/5975/5977 Series

Yes/No	Interim/Major/As needed	Description	Part number
<input type="checkbox"/>	<input type="checkbox"/>	Diffusion pump fluid (Diffusion Pump Models)	6040-0809 Qty 2
<input type="checkbox"/>	<input type="checkbox"/>	IDP-3 Tip Seal Replacement Kit (IDP-3 Dry Pump Models)	G7077-67018
<input type="checkbox"/>	<input type="checkbox"/>	IDP-3 Tip Seal Replacement Kit (no tools – CSD P/N)	5190-9561
<input type="checkbox"/>	<input type="checkbox"/>	IDP-3 Tip Seal Replacement Kit (no tools – VPD P/N)	IDP3TS
<input type="checkbox"/>	<input type="checkbox"/>	Filter element for IDP-3	REPLSLRFILTER2
<input type="checkbox"/>	<input type="checkbox"/>	DS42 Oil Mist Eliminator 3/4G & 3/8	SR03706556
<input type="checkbox"/>	<input type="checkbox"/>	Exhaust oil mist trap (thread) Edwards/Pfeiffer	G1099-80039

MS Maintenance Supplies for 7000/7010 Series

Yes/No	Interim/Major/As needed	Description	Part number
<input type="checkbox"/>	<input type="checkbox"/>	Nitrogen gas filter	RMSN-2
<input type="checkbox"/>	<input type="checkbox"/>	IDP-10 Tip Seal Replacement Kit (IDP-10 Dry Scroll Pump Models)	G7004-67023
<input type="checkbox"/>	<input type="checkbox"/>	IDP-10 Tip Seal Replacement Kit (no tools – VPD P/N)	X3807-67000
<input type="checkbox"/>	<input type="checkbox"/>	Oil Mist Filter RV5	G6600-80043
<input type="checkbox"/>	<input type="checkbox"/>	Filter element for the IDP-10	REPLSLRFILTER1

MS Maintenance Supplies for 7200/7250 Series

Yes/No	Interim/Major/As needed	Description	Part number
<input type="checkbox"/>	<input type="checkbox"/>	Nitrogen gas filter – if required	RMSN-2
<input type="checkbox"/>	<input type="checkbox"/>	RIS Probe Maintenance Kit (7200 Series only)	G7005-60170
<input type="checkbox"/>	<input type="checkbox"/>	DS202 Oil Mist Eliminator	SR03706800
<input type="checkbox"/>	<input type="checkbox"/>	IDP-15 Tip Seal Replacement Kit (IDP-15 Dry Pump Models)	5190-9613
<input type="checkbox"/>	<input type="checkbox"/>	IDP-15 Tip Seal Replacement Kit (no tools – VPD P/N)	X3815-67000
<input type="checkbox"/>	<input type="checkbox"/>	Filter element, for SH-110/SH-112/IDP-15 exhaust silencer	REPLSLRFILTER
<input type="checkbox"/>	<input type="checkbox"/>	DS 3/8 MAG. PLUG AND GASKET	SR03701824

MS Maintenance Supplies for JetClean

Yes/No	Interim/Major/As needed	Description	Part number
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<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Big Universal Trap, 1/8" fittings, Hydrogen, if required	RMSHY-2
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Consumable Parts Reference – Purchasable by customer, not included as part of PM

Common MSD Maintenance Supplies 5973/5975/5977/7000/7010/7200/7250 Series

Yes/No	Interim/Major/As needed	Description	Part number
<input checked="" type="checkbox"/>	<input type="checkbox"/>	El High Temperature Filaments	G7005-60061 Qty 2
<input type="checkbox"/>	<input type="checkbox"/>	HES El Filaments	G7002-60001
<input type="checkbox"/>	<input type="checkbox"/>	LE-El Filaments	G3850-60021
<input type="checkbox"/>	<input type="checkbox"/>	CI High Temperature Filament – all MSDs	G7005-60072
<input type="checkbox"/>	<input type="checkbox"/>	PFTBA GCMS Tuning Standard calibrant	05971-60571
<input type="checkbox"/>	<input type="checkbox"/>	PFDTD calibrant, 1 mL	8500-8510
<input type="checkbox"/>	<input type="checkbox"/>	PFET, IRM calibrant for GC QTOF 0.5 mL	G190-0531

MSD Maintenance Supplies 5973/5975/5977 Series

Yes/No	Interim/Major/As needed	Description	Part number
<input type="checkbox"/>	<input type="checkbox"/>	CI Interface tip seal (tip and spring combo)	G1999-60412
<input type="checkbox"/>	<input type="checkbox"/>	CI Interface tip seal (tip only)	G3870-20542
<input type="checkbox"/>	<input type="checkbox"/>	CI Interface tip seal spring (spring only)	G1999-20023
<input type="checkbox"/>	<input type="checkbox"/>	Repeller insulator	G1099-20133 Qty 2
<input type="checkbox"/>	<input type="checkbox"/>	Lens insulator/holder (HES)	G7002-20074
<input type="checkbox"/>	<input type="checkbox"/>	Ring heater/sensor assembly (HES)	G7002-60043
<input type="checkbox"/>	<input type="checkbox"/>	Ceramic insulator for Extractor (HES)	G7002-20064
<input type="checkbox"/>	<input type="checkbox"/>	Transfer-Line Tip Cap, Threaded	G3870-20547
<input type="checkbox"/>	<input type="checkbox"/>	Transfer-Line Tip Base, Threaded	G3870-20548

MS Maintenance Supplies for 7000/7010 Series

Yes/No	Interim/Major/As needed	Description	Part number
<input type="checkbox"/>	<input type="checkbox"/>	CI Interface tip seal - 7000	G1999-60412
<input type="checkbox"/>	<input type="checkbox"/>	CI Interface tip seal - 7010	G7002-60412
<input type="checkbox"/>	<input type="checkbox"/>	CI Interface tip seal (tip only)	G3870-20542
<input type="checkbox"/>	<input type="checkbox"/>	CI Interface tip seal spring (spring only)	G1999-20023
<input type="checkbox"/>	<input type="checkbox"/>	Repeller insulator - 7000	G1099-20133 Qty 2
<input type="checkbox"/>	<input type="checkbox"/>	Lens insulator/holder (HES)	G7002-20074
<input type="checkbox"/>	<input type="checkbox"/>	Ring heater/sensor assembly (HES)	G7002-60043
<input type="checkbox"/>	<input type="checkbox"/>	Ceramic insulator for Extractor (HES)	G7002-20064
<input type="checkbox"/>	<input type="checkbox"/>	Transfer-Line Tip Cap, Threaded	G3870-20547
<input type="checkbox"/>	<input type="checkbox"/>	Transfer-Line Tip Base, Threaded	G3870-20548

MS Maintenance Supplies for 7200 Series

Yes/No	Interim/Major/As needed	Description	Part number
<input type="checkbox"/>	<input type="checkbox"/>	Extractor Lens Insulator	G7005-20133
<input type="checkbox"/>	<input type="checkbox"/>	Ion Focus Insulator	G7005-20442
<input type="checkbox"/>	<input type="checkbox"/>	Ring Heater/Sensor Assembly	G7005-60110
<input type="checkbox"/>	<input type="checkbox"/>	RIS Xfer Tip	G7005-20542
<input type="checkbox"/>	<input type="checkbox"/>	RIS Xfer Tip Spring	G7005-20024

MS Maintenance Supplies for 7250 Series

Yes/No	Interim/Major/As needed	Description	Part number
<input type="checkbox"/>	<input type="checkbox"/>	Lens insulator/holder (HES)	G7002-20074
<input type="checkbox"/>	<input type="checkbox"/>	Ring heater/sensor assembly (HES)	G7002-60043
<input type="checkbox"/>	<input type="checkbox"/>	Ceramic insulator for Extractor (HES)	G7002-20064
<input type="checkbox"/>	<input type="checkbox"/>	Transfer-Line Tip Cap, Threaded	G3870-20547
<input type="checkbox"/>	<input type="checkbox"/>	Transfer-Line Tip Base, Threaded	G3870-20548
<input type="checkbox"/>	<input type="checkbox"/>	El Extractor Transfer Tip	G3870-20542
<input type="checkbox"/>	<input type="checkbox"/>	CI Tip Compression Spring	G1999-20023

MS Maintenance Supplies for Intuvo 9000 MS Systems

Yes/No	Interim/Major/As needed	Description	Part number
<input type="checkbox"/>	<input type="checkbox"/>	Swaged MS Tail - Packaged	G4590-60009
<input type="checkbox"/>	<input type="checkbox"/>	Swaged MS Tail (HES) - Packaged	G4590-60109

Common MS Maintenance Supplies

Yes/No	Interim/Major/As needed	Description	Part number
<input type="checkbox"/>	<input type="checkbox"/>	Abrasive paper, 30 um	5061-5896
<input type="checkbox"/>	<input type="checkbox"/>	Alumina powder	393706201
<input type="checkbox"/>	<input type="checkbox"/>	Cloths, clean (pkg of 15)	05980-60051
<input type="checkbox"/>	<input type="checkbox"/>	Cloths, cleaning (pkg of 300)	9310-4828
<input type="checkbox"/>	<input type="checkbox"/>	Cotton swabs (pkg of 100)	5080-5400
<input type="checkbox"/>	<input type="checkbox"/>	Gloves, clean, large	8650-0030
<input type="checkbox"/>	<input type="checkbox"/>	Gloves, clean, small	8650-0029

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

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

Expiration Date: Feb 05, 2027

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

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

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

CALIBRATION STANDARDS					
Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	13080206	CC401947	4950 PPM CARBON MONOXIDE/NITROGEN	+/- 0.4%	Feb 15, 2019
PRM	12367	APEX1099237	9.82 PPM NITROGEN DIOXIDE/AIR	+/- 2.0%	Jun 02, 2017
NTRM	12010724	KAL004497	50.03 PPM NITRIC OXIDE/NITROGEN	+/- 0.8%	Mar 12, 2024
GMIS	1114201601	CC506710	4.971 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.0%	Nov 14, 2019
NTRM	14010327	KAL004376	49.08 PPM SULFUR DIOXIDE/NITROGEN	+/- 1.0%	Apr 17, 2024

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

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

Triad Data Available Upon Request

PERMANENT NOTES: PRODUCED IN ACCORDANCE WITH ISO17025 REQUIREMENTS

NOTES:

Gross Weight: 27806.3 grams

Net Weight: 4733.2 grams

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



TESTING CERT No. 3082.05

[Signature]
Approved for Release



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.: CP20230345EA
Operation No.: CP2023080023

Certificate of Calibration

Equipment: Sound Calibrator

Manufacturer: Cirrus Research Plc

Model/Type: CR-515

Serial No.: 97097

ID No.: -

Customer: SECOT Co.,Ltd.

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

Received Date: 28 August 2023

Calibrated Date: 4 September 2023

Issued Date: 8 September 2023

Calibrated by: Ms. Juntaporn Kunhakorn

Approved by:

(Mr. Sittichai Swaksuriyawong)
Group Manager

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

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

Certificate No.: CP20230345EA

Calibration Report

Equipment: Sound Calibrator
Manufacturer: Cirrus Research Plc
Model/Type: CR:515
Serial No.: 97097
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	2787490	AA-1024-22	6 November 2023
2) Waveform Generator	33511B	MY52302264	CK20230039EA	27 June 2024
3) Audio Analyzing DMM	2015-P	000136E	E1U225466	2 December 2023
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; NSC Accredited Calibration No.0119

Result of Calibration:-

1. Function : Sound pressure level

Nominal Frequency (Hz)	Specified Sound Pressure level (dB)	Measured value (dB)	Deviated value ^[1] (dB)	Acceptance limit ^[3] (dB)
1000	94	94.13	0.13	±0.25

2. Function : Frequency

Nominal Sound Pressure level (dB)	Specified Frequency (Hz)	Measured value (Hz)	Deviated value ^[2] (%)	Acceptance limit ^[3] (%)
94	1000	1000.3	0.0	±0.7

Certificate No.: CP20230345EA

Calibration Report

3. Function : Total distortion + noise

Nominal Sound Pressure level (dB)	Nominal Frequency (Hz)	Measured value ^[4] (%)	Acceptance limit ^[5] (%)
94	1000	1.0	2.5

Uncertainty of measurement

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

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

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

-- End of Report --

CERTIFICATE OF CALIBRATION

ISSUED BY Noisemeters

DATE OF ISSUE 26 March 2024

CERTIFICATE NUMBER 211259

NoiseMeters

NoiseMeters
Acoustic House
Bridlington Road
Hunmanby
YO14 0PH
United Kingdom
www.noisemeters.com

Page 1 of 2

Approved signatory
N.Smith
Electronically signed:



doseBadge Reader : IEC 60942:2003

Instrument information

Manufacturer: Cirrus Research plc

Notes:

Model: RC:110A

Serial number: 95167

Class: 2

Test summary

Date of calibration: 25 March 2024

The doseBadge reader detailed above has been calibrated to the published data as described in the operating manual and in the half-inch configuration. The procedures and techniques used are as described in IEC60942_2003 Annex B – Periodic Tests and three determinations of the sound pressure level, frequency and total distortion were made.

The sound pressure level was measured using a WS2F condenser microphone type MK:224 manufactured by Cirrus Research plc.

The results have been corrected to the reference pressure of 101.33 kPa using the manufacturer's data.

The doseBadge Reader has been shown to conform to the Class 2 requirements for periodic testing, described in Annex B of IEC 60942:2003 for the sound pressure level(s) and frequency(ies) stated, for the environmental conditions under which the tests were performed.

However, as public evidence was not available, from a testing organisation responsible for pattern approval, to demonstrate that the model of doseBadge Reader conformed to the requirements for pattern evaluation described in Annex A of IEC 60942:2003, no general statement or conclusion can be made about conformance of the doseBadge Reader to the requirements of IEC 60942:2003.

Notes:

This certificate provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory. The results within this certificate relate only to the items calibrated. The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a coverage probability of approximately 95%.

CERTIFICATE OF CALIBRATION

Certificate Number:

211259

Page 2 of 2

Environmental conditions

The following conditions were recorded at the time of the test:

Before Pressure: 99.26 kPa Temperature: 22.1 °C Humidity: 33.4 %
After Pressure: 99.26 kPa Temperature: 22.1 °C Humidity: 34.6 %

Test equipment

Equipment	Manufacturer	Model	Serial number
Distortion Meter	Keithley	2015	0839263
Acoustic Calibrator	Bruel and Kjaer	4231	2610257
Environmental Monitor	Comet	T7510	21962628

Initial Acoustic Results

	Expected	Sample 1	Sample 2	Sample 3	Average	Deviation	Tolerance	Uncertainty
Level (dB)	114.00	113.41	113.54	113.55	113.50	-0.50	±0.75	0.11 dB
Distortion (%)	< 4.00	0.49	0.50	0.55	0.51	0.51	+4.00	0.13 %
Frequency (Hz)	1000.0	990.5	990.5	990.4	990.5	-9.5	±20.0	0.1 Hz

The measured quantities or deviations (as applicable), extended by the expanded combined uncertainty of measurement, must not exceed the corresponding tolerance.

Adjusted Acoustic Results

	Expected	Sample 1	Sample 2	Sample 3	Average	Deviation	Tolerance	Uncertainty
Level (dB)	114.00	113.99	113.99	113.98	113.99	-0.01	±0.75	0.11 dB
Distortion (%)	< 4.00	0.42	0.41	0.41	0.42	0.42	+4.00	0.13 %
Frequency (Hz)	1000.0	990.3	990.4	990.3	990.4	-9.6	±20.0	0.1 Hz

Functionality Results

Function	Result
Keypad	Pass
Battery Power	Pass
Display	Pass
Communication	Pass
2 way IR link	Pass
Clock	Pass

End of results

ภาคผนวก ฉ

ใบอนุญาตขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
จากกรมโรงงานอุตสาหกรรม



ที่ อก ๐๓๑๐(๑)/ ๑๑ ๐๑ ๖

กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๒๐ กรกฎาคม ๒๕๖๖

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท ซีคอต จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๗ เมษายน ๒๕๖๖

- สิ่งที่ส่งมาด้วย ๑. รายชื่อผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๑ แผ่น
๒. รายชื่อเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๑ แผ่น
๓. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๙ แผ่น

ตามหนังสือที่อ้างถึง บริษัท ซีคอต จำกัด ขอต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๒๓๙ สถานที่ตั้งเลขที่ ๒๓๙ ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพมหานคร ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท ซีคอต จำกัด ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

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

หนังสือฉบับนี้จะหมดอายุในวันที่ ๒ พฤษภาคม ๒๕๖๙ หากประสงค์จะต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อกรมโรงงานอุตสาหกรรมภายใน ๓๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ซึ่งคำขอต่ออายุดังกล่าวขอรับได้ที่กรมโรงงานอุตสาหกรรม ทั้งนี้ สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ที่หน้าเว็บไซต์กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายประสม ดำรงพงษ์)

กองวิจัยและเตือนภัยมลพิษโรงงาน
ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

โทร. ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๔๙

ไปรษณีย์อิเล็กทรอนิกส์ saraban@diw.mail.go.th



“อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว”



สิ่งที่ส่งมาด้วย ๑

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท ซีคอต จำกัด

เลขทะเบียน ๖-๒๓๙

ที่ อก ๐๓๑๐(๑)/ ๑๑ ๐๑ ๖

ลงวันที่ ๒๐ กรกฎาคม ๒๕๖๖

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๑๐ ราย

- ๑) นายขรรชัย เกรียงไกรอุดม
๒) นางสมฤดี เกรียงไกรอุดม
๓) นางสาวอารยา ทิพรัักษ์
๔) นางสาวเชมชุตตา อินทร์ศรี
๕) นางสาวปริตตา สมใจ
๖) นางสาวธัญญา มาตา
๗) นางสาวลดาวัลย์ วงศ์เจริญ
๘) นางสาวณัฏฐพร เกตะวันดี
๙) นางสาวนริสา ภูวสรเพ็ชญ์
๑๐) นางสาวศิริวรรณ ฉิมสง่า

- ทะเบียนเลขที่ ๖-๒๓๙-ก-๐๐๐๒
ทะเบียนเลขที่ ๖-๒๓๙-ก-๐๐๐๓
ทะเบียนเลขที่ ๖-๒๓๙-ก-๐๐๐๔
ทะเบียนเลขที่ ๖-๒๓๙-ก-๐๐๐๕
ทะเบียนเลขที่ ๖-๒๓๙-ก-๐๐๐๖
ทะเบียนเลขที่ ๖-๒๓๙-ก-๐๐๐๗
ทะเบียนเลขที่ ๖-๒๓๙-ก-๐๐๐๘
ทะเบียนเลขที่ ๖-๒๓๙-ก-๐๐๐๙
ทะเบียนเลขที่ ๖-๒๓๙-ก-๐๐๑๐
ทะเบียนเลขที่ ๖-๒๓๙-ก-๐๐๑๑

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท ซีคอฟ จำกัด

เลขทะเบียน ว-๒๓๙

ที่ อก ๐๓๑๐(๑)/ ๑๑ ๐ ๑ ๖

ลงวันที่ ๒๐ กรกฎาคม ๒๕๖๖

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๓๘ ราย

- ๑) นางสาวสุดาพร สุนทร
- ๒) นางสาวสุธาทิพย์ เทียนเตี้ย
- ๓) นางสาวสุนันทา ศิริพัฒนานนท์
- ๔) นายบวร ดีชัยยะ
- ๕) นางสาวเกศรินทร์ วรเดชาวิทยา
- ๖) นายอนิวัฒน์ พิมวันนา
- ๗) นายชิตพล สมประสงค์
- ๘) นางสาวศศิธร พรหมประเสริฐ
- ๙) นายศิวะนนท์ กุลวงษ์
- ๑๐) นางสาวอริษา คนิวรานนท์
- ๑๑) นางสาวสิริวรรณ แก้วชิงดวง
- ๑๒) นางสาวปัทมวรรณ สุวรรณวิโรจน์
- ๑๓) นางสาวกนิษฐา เจริญเชื้อ
- ๑๔) นายวัชรกานต์ ประมาคะเด
- ๑๕) นายทอง เองชวลกุล
- ๑๖) นางสาวกฤษณา จันทุม
- ๑๗) นางสาวพรนภา บุตรธรรม
- ๑๘) นางสาวธารณี อาจปลิว
- ๑๙) นายธนโชติ ช่างล้อ
- ๒๐) นางสาวพัชรา สมานฉันท
- ๒๑) นางสาวจุฑารัตน์ แจ่มเรือน
- ๒๒) นางสาวณิสดา กุ้ยอ่อน
- ๒๓) นายกิตติพงศ์ ตะเกิงสุข
- ๒๔) นายจิรวัฒน์ โคตรคำหาญ
- ๒๕) นายชนะพล อัครผล
- ๒๖) นางสาวทิพย์สุดา วรรณการ
- ๒๗) นายสิทธิชัย สว่างวงศ์ไชย
- ๒๘) นายพิษณุ สีนามเพ็ง
- ๒๙) นายรัตนชัย ขอบทำกิจ
- ๓๐) นายธนาวุฒิ ต่วนแสง
- ๓๑) นายณัฐชัย ไชยโคตร
- ๓๒) นายณัฐดนัย กฤษณะโสม
- ๓๓) นายศุภชัย สุขใหม่
- ๓๔) นายรอมฎอน เหลี่ยมหมาด
- ๓๕) นางสาวสุภาวดี บัวแก้ว
- ๓๖) นางสาวมาธิยาณี ฮาแว
- ๓๗) นางสาววิระยา ปิจฉิมบุรณ์
- ๓๘) นางสาวศลิษา อินทรีย์

- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๐๑
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๐๓
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๐๔
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๐๕
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๐๖
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๐๗
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๐๘
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๐๙
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๑๐
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๑๑
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๑๒
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๑๓
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๑๔
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๑๕
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๑๖
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๑๗
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๑๘
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๑๙
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๒๐
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๒๑
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๒๒
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๒๓
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๒๔
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๒๕
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๒๖
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๒๗
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๒๘
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๒๙
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๓๐
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๓๑
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๓๒
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๓๓
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๓๔
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๓๕
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๓๖
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๓๗
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๓๘
- ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๓๙

3/กม

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท ซีคอฟ จำกัด

เลขทะเบียน ว-๒๓๙

ที่ อก ๐๓๑๐(๑)/ ๑๑ ๐ ๑ ๖

ลงวันที่ ๒๐ กรกฎาคม ๒๕๖๖

ขอขยายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๕๕ รายการ

น้ำเสีย จำนวน 45 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
2	Arsenic	2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾ 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⁾

3/กม

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] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[4]
18	4,4'-DDT	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] 3) Digestion...

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] 3) Digestion...

น้ำได้น...

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] 31mg)

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] 31mg)

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>sim</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>sim</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] 3mg/l

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] 3mg/l

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>Simul</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]
10	Chromium (VI)	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]
11	Cobalt	1) Waste Extraction, Colorimetric Method ^[1,17] 2) Alkaline Digestion, Colorimetric Method ^[8,17]
12	Copper	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,14] 2) Digestion, Inductively Coupled Plasma Method ^[7,14] 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>Simul</i>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
13	2,4-D	1) Waste Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,25] 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25]
14	DDD	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]

ดิน จำนวน 124 รายการ

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

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] 

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 ^[26]
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] <i>จันท</i>

2) Digestion...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
102	Silver	2) Digestion, Inductively Coupled Plasma Method ^[7,14] 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] <i>จันท</i>

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) <i>สิงห์</i>

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
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
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ที่ ออก ๐๓๑๐(๑)/ ๕๐๕๔



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 ว-๒๓๙
สถานที่ตั้งเลขที่ ๒๓๙ ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพมหานคร ขอเปลี่ยนแปลงบุคลากร
ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้ยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์
จำนวน ๒ ราย ได้แก่

๑) นายวัชรกานต์ ประมาคะเต

ทะเบียนเลขที่ ว-๒๓๙-จ-๐๐๑๕

๒) นายรัตนชัย ชอบทำกิจ

ทะเบียนเลขที่ ว-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



ภาคผนวก ข

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



แบบ กมช./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 ซีคอร์ท จำกัด ฝ่ายห้องปฏิบัติการทดสอบด้านสิ่งแวดล้อม
(Secot Company Limited, Environmental Laboratory Division)

ตั้งอยู่เลขที่
(Address)

๒๓๙ ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพมหานคร
(239 RimKongprapa 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)

โดยมีรายละเอียดสาขาและขอบข่ายที่ได้อ้างอิง 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. ๒๕๖๖
(Issue date : 6 December B.E. 2566 (2023))


(นายวีระศักดิ์ เพ็งหล่ง)
(นายวีระศักดิ์ เพ็งหล่ง)

ผู้อำนวยการสำนักงานคณะกรรมการการมาตรฐานแห่งชาติ
ปฏิบัติราชการแทน

เลขาธิการสำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม



Signed by สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม (msi.)
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)

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

หมายเลขการรับรองที่
(Accreditation No.)

ทดสอบ 0394
(Testing 0394)

ฉบับที่ 02
(Issue No.02)

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

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

สถานภาพห้องปฏิบัติการ
(Laboratory status)

☒ ถาวร (Permanent) ☐ นอกสถานที่ (Site) ☐ ชั่วคราว (Temporary)

☐ เคลื่อนที่ (Mobile) ☐ หลายสถานที่ (Multisite)

สาขาการทดสอบ (Field of Testing)	รายการทดสอบ (Parameter)	วิธีทดสอบ (Test Method)
สาขาสิ่งแวดล้อม (environmental field)		
1. น้ำและน้ำเสีย (water and wastewater)	<ul style="list-style-type: none">โลหะหนัก (heavy metals)สารหนู (Arsenic, As) 0.000 5 mg/L ถึง 0.090 0 mg/Lสารหนู (Arsenic, As) 0.05 mg/L ถึง 4.50 mg/Lแบเรียม (Barium, Ba) 0.02 mg/L ถึง 4.50 mg/Lแคดเมียม (Cadmium, Cd) 0.01 mg/L ถึง 4.50 mg/Lโครเมียม (Chromium, Cr) 0.01 mg/L ถึง 4.50 mg/L	<ul style="list-style-type: none">Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WEF, 23rd edition, 2017, Part 3030 F and Part 3114 CStandard Methods for the Examination of Water and Wastewater, APHA, AWWA, WEF, 23rd edition, 2017, Part 3030 E and Part 3120 B

กระทรวงอุตสาหกรรมสำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม
(Ministry of Industry, Thai Industrial Standards Institute)

หน้า 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)

☐เคลื่อนที่
(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>

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
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☐ชั่วคราว
(Temporary)

☐เคลื่อนที่
(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>- ซีโอดี (Chemical oxygen demand, COD) 100 mg/L ถึง 4 000 mg/L</p>	<p>- Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WEF, 23rd edition, 2017, Part 5220 D</p>
<p>2. บริเวณทำงาน (workplace)</p>	<p>- ฝุ่นละอองรวม (Total dust) 0.10 mg/filter ถึง 2.00 mg/filter</p> <p>- ฝุ่นละอองขนาดเล็ก (Respirable dust) 0.10 mg/filter ถึง 2.00 mg/filter</p>	<p>- NIOSH Manual of Analytical Methods (NMAM), method 0500, 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

(Scope of Accreditation for Testing)

ใบรับรองเลขที่ 24-LB0026

(Certification No. 24-LB0026)



ฉบับที่ 02
(Issue No.02)

ออกให้ตั้งแต่วันที่ 30 ตุลาคม พ.ศ. 2566
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ถึงวันที่ 8 กันยายน พ.ศ. 2571
(Until) (8 September B.E.2571 (2028))

สถานภาพห้องปฏิบัติการ
(Laboratory status)

☒ ถาวร
(Permanent)

☐ นอกสถานที่
(Site)

☐ชั่วคราว
(Temporary)

☐เคลื่อนที่
(Mobile)

☐หลายสถานที่
(Multisite)

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 - โทโครไซลีน (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)

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
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☐ นอกสถานที่
(Site)

☐ชั่วคราว
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☐เคลื่อนที่
(Mobile)

☐หลายสถานที่
(Multisite)

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)

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
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☒ นอกสถานที่
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(Temporary)

☐เคลื่อนที่
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(Multisite)

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-บิวทาไดอิน (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) อะคลอไลน์ (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>

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)

☐เคลื่อนที่
(Mobile)

☐หลายสถานที่
(Multisite)

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"> อะคริโนไนล์ (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
(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)

☐เคลื่อนที่
(Mobile)

☐หลายสถานที่
(Multisite)

สาขาการทดสอบ (Field of Testing)	รายการทดสอบ (Parameter)	วิธีทดสอบ (Test Method)
<p>สาขาสสิ่งแวดล้อม (environmental field)</p> <p>4. บรรยากาศทั่วไป (ต่อ) (ambient air) (cont.)</p>	<p>- สารอินทรีย์ระเหยง่าย (Volatile organic compounds, VOCs)</p> <ul style="list-style-type: none"> • 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>

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)

☐เคลื่อนที่
(Mobile)

☐หลายสถานที่
(Multisite)

สาขาการทดสอบ (Field of Testing)	รายการทดสอบ (Parameter)	วิธีทดสอบ (Test Method)
<p>สาขาสสิ่งแวดล้อม (environmental field)</p> <p>4. บรรยากาศทั่วไป (ต่อ) (ambient air) (cont.)</p>	<p>- สารอินทรีย์ระเหยง่าย (Volatile organic compounds ,VOCs)</p> <ul style="list-style-type: none"> • 1,2-ไดโบรมโอเอเทน (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-เตตระคลอโรเอทิลีน (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>

ภาคผนวก ซ

ใบอนุญาตเป็นนิติบุคคลผู้ให้บริการตรวจวัดและวิเคราะห์การทำงาน
จากกรมสวัสดิการและคุ้มครองแรงงาน



แบบ ก.บ.ญ
นิติบุคคล

กรมสวัสดิการและคุ้มครองแรงงาน

ใบอนุญาต

เป็นนิติบุคคลผู้ให้บริการตรวจวัดและวิเคราะห์สภาวะการทำงานเกี่ยวกับระดับความร้อน

ใบอนุญาตเลขที่ ๑๔๐๑-๐๓-๒๕๖๕-๐๐๔๘

อนุญาตให้.....บริษัท ซีเคอที จำกัด.....

เลขทะเบียนนิติบุคคล...๐๑๐๕๕๓๖๐๐๐๘๗๖.....

ตั้งอยู่ เลขที่ ๒๓๔ ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพมหานคร.....

เป็นนิติบุคคลผู้ให้บริการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน ตามกฎกระทรวง
กำหนดมาตรฐานในการบริหาร จัดการ และดำเนินการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อม
ในการทำงานเกี่ยวกับความร้อน แสงสว่าง และเสียง พ.ศ. ๒๕๕๔ ในการตรวจวัดและวิเคราะห์สภาวะการทำงาน
เกี่ยวกับระดับความร้อน ประกอบกับกฎกระทรวงการขึ้นทะเบียนและการอนุญาตให้บริการเพื่อส่งเสริม
ความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน พ.ศ. ๒๕๖๔ แห่งพระราชบัญญัติความปลอดภัย
อาชีวอนามัย และสภาพแวดล้อมในการทำงาน พ.ศ. ๒๕๕๔ โดยมีบุคลากร จำนวน ๕ ราย ดังรายชื่อแนบท้าย
ใบอนุญาตนี้

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

ข-๑๑-๐๔๐๑-๐๔๘-๐๑-๖๕

(ลงนาม)..... (นายทะเบียน)

(นายศักดิ์ศิลป์ สุลาธร)

ตำแหน่ง ผู้อำนวยการกองความปลอดภัยแรงงาน

รายชื่อบุคลากรแนบท้ายใบอนุญาต
เป็นนิติบุคคลผู้ให้บริการตรวจวัดและวิเคราะห์สภาวะการทำงานเกี่ยวกับระดับความร้อน
ของบริษัท ซีคอท จำกัด

ใบอนุญาตเลขที่ ๐๔๐๑-๐๓-๒๕๖๕-๐๐๔๘

- | | |
|-------------------|---------------|
| ๑. นางสาวสุนันทา | ศิริวัฒนานนท์ |
| ๒. นางสาวกนิษฐา | เจริญเชื้อ |
| ๓. นางสาวปัทมวรรณ | สุวรรณวิโรจน์ |
| ๔. นางสาวอลิษา | คนิวรานนท์ |
| ๕. นางสาวชนิตา | หล้าสาย |

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

ให้ไว้ ณ วันที่ ๑๗ มิถุนายน พ.ศ. ๒๕๖๕



(นายสมพจน์ กวางแก้ว)

รองอธิบดี ปฏิบัติราชการแทน

อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน

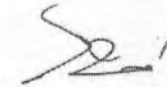
รายชื่อบุคลากร (เพิ่มเติม)
แนบท้ายใบอนุญาตเป็นนิติบุคคลผู้ให้บริการตรวจวัดและวิเคราะห์สภาวะการทำงานเกี่ยวกับระดับความร้อน
ของบริษัท ซีคอท จำกัด

ใบอนุญาตเลขที่ ๐๔๐๑-๐๓-๒๕๖๕-๐๐๔๘

- | | |
|--------------------|-------------|
| ๑. นางสาวศลิษา | อินริย์ |
| ๒. นางสาวมาริยามณี | ยาแ |
| ๓. นางสาววิระยา | ปัจฉิมบุรณ์ |

ทั้งนี้ ตั้งแต่วันที่ ๑๕ มกราคม พ.ศ. ๒๕๖๖ ถึงวันที่ ๑๖ มิถุนายน พ.ศ. ๒๕๖๘

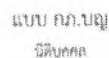
ให้ไว้ ณ วันที่ ๑๕ มกราคม พ.ศ. ๒๕๖๖



(นายสมพจน์ กวางแก้ว)

รองอธิบดี ปฏิบัติราชการแทน

อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน



ใบอนุญาต

เป็นนิติบุคคลให้บริการตรวจวัดและวิเคราะห์สภาพการทำงานเกี่ยวกับระดับแสงสว่าง

ใบอนุญาตเลขที่ ๐๔๐๒-๐๓-๒๕๖๕-๐๐๔๙

อนุญาตให้.....บริษัท ซีเอสเอท จำกัด

เลขทะเบียนนิติบุคคล ๐๑๐๕๕๓๖๐๐๐๙๗๒

ตั้งอยู่ เลขที่ ๒๓๙ ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพมหานคร

เป็นนิติบุคคลผู้ให้บริการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน ตามกฎกระทรวงกำหนดมาตรฐานในการบริหาร จัดการ และดำเนินการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน เกี่ยวกับความร้อน แสงสว่าง และเสียง พ.ศ. ๒๕๕๙ ในการตรวจวัดและวิเคราะห์ผลการการทำงานเกี่ยวกับระดับแสงสว่าง ประกอบกับกฎกระทรวงการขึ้นทะเบียนและการอนุญาตให้บริการเพื่อส่งเสริม ความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน พ.ศ. ๒๕๖๔ แห่งพระราชบัญญัติความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน พ.ศ. ๒๕๕๙ 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

See!

(นายสมพจน์ กวางแก้ว)

รองอธิบดี ปฏิบัติราชการแทน
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน

เกษตรแบบยั่งยืนควบคู่กัน

୨-୩୩-୦୫୦୭-୦୫୯-୦୩-୧୫

(लग्नान)

(นายศักดิ์ศิลป์ ฤทธาธร)

ตำแหน่ง ผู้อำนวยการกองความปลอดภัยแรงงาน


รายชื่อบุคลากรแนบท้ายใบอนุญาต
เป็นนิติบุคคลผู้ให้บริการตรวจวัดและวิเคราะห์สภาวะการทำงานเกี่ยวกับระดับแสงสว่าง
ของบริษัท ซีคอท จำกัด

ใบอนุญาตเลขที่ ๐๔๐๒-๐๓-๒๕๖๕-๐๐๔๙

- | | |
|-------------------|---------------|
| ๑. นางสาวสุนันทา | ศิริวัฒนานนท์ |
| ๒. นางสาวกนิษฐา | เจริญเชื้อ |
| ๓. นางสาวปัทมวรรณ | สุวรรณวิโรจน์ |
| ๔. นางสาวอลิษา | คณิรารานนท์ |
| ๕. นางสาวชนิตา | หล้าสาย |

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

ให้ไว้ ณ วันที่ ๑๗ มิถุนายน พ.ศ. ๒๕๖๕



(นายสมพจน์ กวางแก้ว)

รองอธิบดี ปฏิบัติราชการแทน
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน

รายชื่อบุคลากร (เพิ่มเติม)
แนบท้ายใบอนุญาตเป็นนิติบุคคลผู้ให้บริการตรวจวัดและวิเคราะห์สภาวะการทำงานเกี่ยวกับระดับแสงสว่าง
ของบริษัท ซีคอท จำกัด

ใบอนุญาตเลขที่ ๐๔๐๒-๐๓-๒๕๖๕-๐๐๔๙

- | | |
|-------------------|-------------|
| ๑. นางสาวศลิษา | อินริย์ |
| ๒. นางสาวมาริยามิ | ฮาว |
| ๓. นางสาววิระยา | ปัจฉิมบุรณ์ |

ทั้งนี้ ตั้งแต่วันที่ ๑๓ มกราคม พ.ศ. ๒๕๖๖ ถึงวันที่ ๑๖ มิถุนายน พ.ศ. ๒๕๖๘

ให้ไว้ ณ วันที่ ๑๓ มกราคม พ.ศ. ๒๕๖๖



(นายสมพจน์ กวางแก้ว)

รองอธิบดี ปฏิบัติราชการแทน
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน



แบบ กภ.บุญ
นิติบุคคล

กรมสวัสดิการและคุ้มครองแรงงาน

ใบอนุญาต

เป็นนิติบุคคลผู้ให้บริการตรวจวัดและวิเคราะห์สภาวะการทำงานเกี่ยวกับระดับเสียง

ใบอนุญาตเลขที่ ๐๔๐๓-๐๓-๒๕๖๕-๐๐๔๘

อนุญาตให้.....บริษัท ชีคอส จำกัด.....

เลขทะเบียนนิติบุคคล ๐๑๐๕๕๓๖๐๐๐๘๗๖

ตั้งอยู่ เลขที่ ๒๓๙ ถนนวิมลทองประไพ แขวงนางขี้อ เขตบางซื่อ กรุงเทพมหานคร.....
เป็นนิติบุคคลผู้ให้บริการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน ตามกฎกระทรวงกำหนด
มาตรฐานในการบริหาร จัดการ และดำเนินการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน
เกี่ยวกับความร้อน แสงสว่าง และเสียง พ.ศ. ๒๕๕๙ ในการตรวจวัดและวิเคราะห์สภาวะการทำงานเกี่ยวกับระดับเสียง
ประกอบกับกฎกระทรวงการขึ้นทะเบียนและการอนุญาตให้บริการเพื่อส่งเสริม ความปลอดภัย อาชีวอนามัย
และสภาพแวดล้อมในการทำงาน พ.ศ. ๒๕๖๔ แห่งพระราชบัญญัติความปลอดภัย อาชีวอนามัย และสภาพแวดล้อม
ในการทำงาน พ.ศ. ๒๕๕๕ 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

๒-๑๑-๐๔๐๓-๐๔๘-๐๑-๖๕

(ลงนาม).....(นายทะเบียน)

(นายศักดิ์ศิลป์ ตูลาธร)

ตำแหน่ง ผู้อำนวยการกองความปลอดภัยแรงงาน

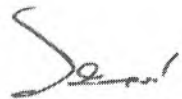
รายชื่อบุคลากรแนบท้ายใบอนุญาต
เป็นนิติบุคคลผู้ให้บริการตรวจวัดและวิเคราะห์สถานะการทำงานเกี่ยวกับระดับเสียง
ของบริษัท ซีคอท จำกัด

ใบอนุญาตเลขที่ ๐๔๐๓-๐๓-๒๕๖๕-๐๐๔๘

- | | |
|-------------------|---------------|
| ๑. นางสาวสุนันทา | ศิริวัฒนานนท์ |
| ๒. นางสาวกนิษฐา | เจริญเชื้อ |
| ๓. นางสาวปัทมวรรณ | สุวรรณวิโรจน์ |
| ๔. นางสาวอลิษา | คนิวรานนท์ |
| ๕. นางสาวชนิตา | หล้าสาย |

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

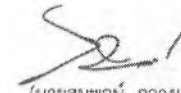
รายชื่อบุคลากร (เพิ่มเติม)
แนบท้ายใบอนุญาตเป็นนิติบุคคลผู้ให้บริการตรวจวัดและวิเคราะห์สถานะการทำงานเกี่ยวกับระดับเสียง
ของบริษัท ซีคอท จำกัด

ใบอนุญาตเลขที่ ๐๔๐๓-๐๓-๒๕๖๕-๐๐๔๘

- | | |
|------------------|-------------|
| ๑. นางสาวศลิษา | อินริย์ |
| ๒. นางสาวมริยาณี | ฮานว |
| ๓. นางสาววิระยา | ปัจฉิมบุรณ์ |

ทั้งนี้ ตั้งแต่วันที่ ๑๓ มกราคม พ.ศ. ๒๕๖๖ ถึงวันที่ ๑๖ มิถุนายน พ.ศ. ๒๕๖๘

ให้ไว้ ณ วันที่ ๑๓ มกราคม พ.ศ. ๒๕๖๖



(นายสมพงษ์ กวางแก้ว)

รองอธิบดี ปฏิบัติราชการแทน
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน



แบบ ก.ภ.บญ
นิติบุคคล

กรมสวัสดิการและคุ้มครองแรงงาน

ใบอนุญาต

เป็นนิติบุคคลผู้ให้บริการตรวจวัดระดับความเข้มข้นของสารเคมีอันตราย
ในบรรยากาศของสถานที่ทำงานและสถานที่เก็บรักษาสารเคมีอันตราย

ใบอนุญาตเลขที่ ๑๒๑๑-๑๓-๒๕๖๕-๐๐๔๙

อนุญาตให้ บริษัท ซีเคอพี จำกัด

เลขทะเบียนนิติบุคคล ๐๑๐๕๕๓๖๐๐๐๙๗๖

ตั้งอยู่ เลขที่ ๒๓๙ ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพมหานคร

เป็นนิติบุคคลผู้ให้บริการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน ตามกฎกระทรวง
กำหนดมาตรฐานในการบริหาร จัดการ และดำเนินการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อม
ในการทำงานเกี่ยวกับสารเคมีอันตราย พ.ศ. ๒๕๕๖ ในการเป็นผู้ให้บริการตรวจวัดระดับความเข้มข้น
ของสารเคมีอันตรายในบรรยากาศของสถานที่ทำงานและสถานที่เก็บรักษาสารเคมีอันตราย ประกอบกับ
กฎกระทรวงการขึ้นทะเบียนและการอนุญาตให้บริการเพื่อส่งเสริมความปลอดภัย อาชีวอนามัย และสภาพแวดล้อม
ในการทำงาน พ.ศ. ๒๕๖๔ แห่งพระราชบัญญัติความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน
พ.ศ. ๒๕๕๔ โดยมีบุคลากร จำนวน ๑๔ ราย ดังรายชื่อแนบท้ายใบอนุญาตนี้

ทั้งนี้ ตั้งแต่วันที่ ๑๕ มิถุนายน พ.ศ. ๒๕๖๕ ถึงวันที่ ๑๓ มิถุนายน พ.ศ. ๒๕๖๘

ให้ไว้ ณ วันที่ ๑๕ มิถุนายน พ.ศ. ๒๕๖๕

(นายสมพงษ์ กวางแก้ว)

รองอธิบดี ปฏิบัติราชการแทน

อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน

เลขทะเบียนควบคุม

๒-๑๑-๐๒๐๑-๐๔๙-๐๑-๖๕

(ลงนาม)

(นายทะเบียน)

(นายศักดิ์ศิลป์ ตูลาธร)

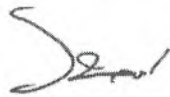
ผู้อำนวยการกองความปลอดภัยแรงงาน

รายชื่อบุคลากรแนบท้ายใบอนุญาต
เป็นนิติบุคคลผู้ให้บริการตรวจวัดระดับความเข้มข้นของสารเคมีอันตรายในบรรยากาศของสถานที่ทำงาน
และสถานที่เก็บรักษาสารเคมีอันตราย
ของบริษัท ซีคอต จำกัด
ใบอนุญาตเลขที่ ๐๒๐๑-๐๓-๒๕๖๕-๐๐๔๔

๑. นายจิตพล	สมประสงค์
๒. นายอนันต์	พิมวันนา
๓. นายศิวะนนท์	กุลวงษ์
๔. นายวัชรกานต์	ประมาคะเต
๕. นายธนโชติ	ช่างลือ
๖. นายกิตติพงศ์	ตะเกิงสุข
๗. นายจิรวัดน์	โคตรคำหาญ
๘. นายศุภกิจ	ตั้งมุกา
๙. นางสาวธัญลักษณ์	โยธา
๑๐. นางสาวพิชญ์สุดา	วรรณการ
๑๑. นางสาวสายธาร	ภูเขียว
๑๒. นายภาคภูมิ	แทนไทย
๑๓. นายธนาวุฒิ	ด่วนแสง
๑๔. นายรัตนชัย	ชอบทำกิจ

ทั้งนี้ ตั้งแต่วันที่ ๑๔ มิถุนายน พ.ศ. ๒๕๖๕ ถึงวันที่ ๑๓ มิถุนายน พ.ศ. ๒๕๖๘

ให้ไว้ ณ วันที่ ๑๔ มิถุนายน พ.ศ. ๒๕๖๕



(นายสมพงษ์ กวางแก้ว)

รองอธิบดี ปฏิบัติราชการแทน
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน



แบบ กบ.บญ
นิติบุคคล

กรมสวัสดิการและคุ้มครองแรงงาน

ใบอนุญาต

เป็นนิติบุคคลผู้ให้บริการวิเคราะห์ระดับความเข้มข้นของสารเคมีอันตราย
ในบรรยากาศของสถานที่ทำงานและสถานที่เก็บรักษาสารเคมีอันตราย

ใบอนุญาตเลขที่ ๐๒๐๒-๐๓-๒๕๖๕-๐๐๓๔

อนุญาตให้ บริษัท ซีคอต จำกัด.....

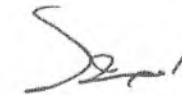
เลขทะเบียนนิติบุคคล ๑๑๐๕๕๓๖๐๐๐๘๙๖๖.....

ตั้งอยู่ เลขที่ ๒๓๔ ถนนวิมลคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพมหานคร.....

เป็นนิติบุคคลผู้ให้บริการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน ตามกฎกระทรวง
กำหนดมาตรฐานในการบริหาร จัดการ และดำเนินการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อม
ในการทำงานเกี่ยวกับสารเคมีอันตราย พ.ศ. ๒๕๕๖ ในการเป็นผู้ให้บริการวิเคราะห์ระดับความเข้มข้น
ของสารเคมีอันตรายในบรรยากาศของสถานที่ทำงานและสถานที่เก็บรักษาสารเคมีอันตราย ประกอบกับ
กฎกระทรวงการขึ้นทะเบียนและการอนุญาตให้บริการเพื่อส่งเสริมความปลอดภัย อาชีวอนามัย และสภาพแวดล้อม
ในการทำงาน พ.ศ. ๒๕๖๔ แห่งพระราชบัญญัติความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน
พ.ศ. ๒๕๕๔ โดยมีบุคลากร จำนวน ๑๔ ราย ดังรายชื่อแนบท้ายใบอนุญาตนี้

ทั้งนี้ ตั้งแต่วันที่ ๑๔ มิถุนายน พ.ศ. ๒๕๖๕ ถึงวันที่ ๑๓ มิถุนายน พ.ศ. ๒๕๖๘

ให้ไว้ ณ วันที่ ๑๔ มิถุนายน พ.ศ. ๒๕๖๕



(นายสมพงษ์ กวางแก้ว)

รองอธิบดี ปฏิบัติราชการแทน
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน

รายชื่อบุคลากรแนบท้ายใบอนุญาต
เป็นนิติบุคคลผู้ให้บริการวิเคราะห์ระดับความเข้มข้นของสารเคมีอันตรายในบรรยากาศของสถานที่ทำงาน
และสถานที่เก็บรักษาสารเคมีอันตราย
ของบริษัท ซีคอฟ จำกัด
ใบอนุญาตเลขที่ ๐๒๐๒-๐๓-๒๕๖๕-๐๐๓๔

๑. นางสาววิสา	ภูสรพีชญ์
๒. นางอารยา	ทิพรักษ์
๓. นางสาวศิริวรรณ	ฉิมสง่า
๔. นางสาวสุทธาทิพย์	เทียนเดีย
๕. นางสาวพรนภา	บุตรธรรม
๖. นางสาวธารินี	อาจปลิว
๗. นางสาวกฤษณา	จันทุม
๘. นางสาวพัชรา	สมานอันท์
๙. นางสาวจณิสตา	กัญอ่อน
๑๐. นางสาวศศิภา	ใจดี
๑๑. นางสาวจุฑารัตน์	แจ่มเรือน
๑๒. นางสาวณัฐศิริ	เลิศธีรพัฒน์
๑๓. นางสาวสัญญาลักษณ์	อินทระสิทธิ์
๑๔. นางสาวสุดาพร	สุนทร

ทั้งนี้ ตั้งแต่วันที่ ๑๕ มิถุนายน พ.ศ. ๒๕๖๕ ถึงวันที่ ๑๓ มิถุนายน พ.ศ. ๒๕๖๘

ให้ไว้ ณ วันที่ ๑๕ มิถุนายน พ.ศ. ๒๕๖๕



(นายสมพงษ์ กวางแก้ว)

รองอธิบดี ปฏิบัติราชการแทน
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน

เลขทะเบียนควบคุม
ข-๑๑-๐๒๐๒-๐๓๔-๒๕-๖๕

(ลงนาม).....(นายทะเบียน)
(นายศักดิ์ศิลป์ จุลสาร)
ผู้อำนวยการกองความปลอดภัยแรงงาน