

ภาคผนวก ง

ใบรับรองผลการตรวจวัดและวิเคราะห์

## ภาคผนวก ง.1

### ใบรับรองผลการตรวจวัดคุณภาพอากาศในบรรยากาศ



**บริษัท ซีคอต จำกัด**  
**SECOT CO., LTD.**

239 ถนนวิมลทองประชา แขวงบางซื่อ เขตบางซื่อ กรุงเทพฯ 10800  
239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND  
TEL : +66(0) 2959-3600 FAX : +66(0) 2959-3535 E-mail : envserv@secot.co.th

**AMBIENT AIR QUALITY ANALYSIS REPORT**

CLIENT NAME : UBE Chemicals (Asia) Public Co., Ltd. REFERENCE NO. : 222030 Amb (Cert.)/Mar/TSP  
SAMPLING BY : SECOT Co., Ltd. SAMPLING DATE : 21-28/03/2022  
RECEIVED DATE : 30/03/2022 ANALYTICAL DATE : 01-02/04/2022  
REPORT DATE : 05/04/2022 SAMPLE CONDITION : Normal  
SITE OPERATOR : Mr.Supakit Tamoka  
LOCATION DESCRIPTION : 1. Technology IRPC School  
2. Moo 4 of Ta-Phong Sub-District

PARAMETER	SAMPLING DATE	UNITS	RESULTS		STANDARD*	REFERENCE METHODS
			1	2		
TSP (24-hr)	21-22/03/2022	mg/m <sup>3</sup>	0.012	0.014	0.530	40 CFR 50 App. B
	22-23/03/2022	mg/m <sup>3</sup>	0.015	0.015		
	23-24/03/2022	mg/m <sup>3</sup>	0.018	0.018		
	24-25/03/2022	mg/m <sup>3</sup>	0.015	0.017		
	25-26/03/2022	mg/m <sup>3</sup>	0.011	0.012		
	26-17/03/2022	mg/m <sup>3</sup>	0.010	0.014		
	27-28/03/2022	mg/m <sup>3</sup>	0.010	0.016		

*Phatchara Samanchan*

(Miss Phatchara Samanchan)

Analyst

*Narisa Poowasanpetch*

(Miss Narisa Poowasanpetch)

Technical Management Team

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

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

3. \* Notification of National Environment Board, No.24, B.E.2547 (2004).



**บริษัท ซีคอต จำกัด**  
**SECOT CO., LTD.**

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**AMBIENT AIR QUALITY ANALYSIS REPORT**

CLIENT NAME : UBE Chemicals (Asia) Public Co., Ltd. REFERENCE NO. : 222030 Amb (Cert.)/Mar/PM-10  
SAMPLING BY : SECOT Co., Ltd. SAMPLING DATE : 21-28/03/2022  
RECEIVED DATE : 30/03/2022 ANALYTICAL DATE : 01-02/04/2022  
REPORT DATE : 05/04/2022 SAMPLE CONDITION : Normal  
SITE OPERATOR : Mr.Supakit Tamoka  
STATION DESCRIPTION : 1. Technology IRPC School  
2. Moo 4 of Ta-Phong Sub-District

PARAMETER	SAMPLING DATE	UNITS	RESULTS		STANDARD*	REFERENCE METHODS
			1	2		
PM-10 (24-hr)	21-22/03/2022	mg/m <sup>3</sup>	0.006	0.009	0.120	40 CFR 50 App. J
	22-23/03/2022	mg/m <sup>3</sup>	0.012	0.008		
	23-24/03/2022	mg/m <sup>3</sup>	0.013	0.013		
	24-25/03/2022	mg/m <sup>3</sup>	0.011	0.011		
	25-26/03/2022	mg/m <sup>3</sup>	0.008	0.007		
	26-17/03/2022	mg/m <sup>3</sup>	0.008	0.008		
	27-28/03/2022	mg/m <sup>3</sup>	0.008	0.008		

*Phatchara Samanchan*

(Miss Phatchara Samanchan)

Analyst

*Narisa Poowasanpetch*

(Miss Narisa Poowasanpetch)

Technical Management Team

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

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

3. \* Notification of National Environment Board, No.24, B.E.2547 (2004).



## Ambient Air Monitoring Results : Nitrogen dioxide MTR-CPL

Location : Technology IRPC School	Monitor Period : 21-28 Mar 2022
Analyzer Model : API 200A	Station No : Mobile 10
Serial No : 1651	Site Operator : Mr.Supakit Tamooka
Calibrator Model : Teledyne 700E	Serial No : 587
Calibration Gas Cylinder I.D.: EB0108319	
Certified Date : 13 Jan 2022	Cal Concentration (ppb) : 0,100,200,400
Expire Date : 12 Jan 2023	

Time	NO2 Concentration (ppb)						
	21-22 Mar 2022	22-23 Mar 2022	23-24 Mar 2022	24-25 Mar 2022	25-26 Mar 2022	26-27 Mar 2022	27-28 Mar 2022
10:00 - 11:00	8.4	5.1	7.3	10.2	9.9	12.0	9.9
11:00 - 12:00	9.8	4.7	8.3	8.8	10.2	5.4	10.2
12:00 - 13:00	9.4	13.6	4.0	8.7	6.5	11.0	6.5
13:00 - 14:00	9.9	10.5	11.2	12.5	12.5	16.2	12.5
14:00 - 15:00	9.5	10.2	14.9	9.2	9.3	11.0	9.3
15:00 - 16:00	9.4	8.8	7.6	9.9	9.2	10.8	9.2
16:00 - 17:00	7.7	8.7	8.2	4.8	15.7	15.0	15.6
17:00 - 18:00	7.1	7.3	17.4	6.9	14.2	12.8	9.8
18:00 - 19:00	11.8	14.4	14.2	6.8	16.2	11.4	16.2
19:00 - 20:00	8.4	16.8	16.8	14.2	9.5	12.2	22.3
20:00 - 21:00	5.7	10.5	18.6	18.3	7.3	3.8	15.2
21:00 - 22:00	4.2	10.8	9.6	11.1	5.2	6.3	18.8
22:00 - 23:00	5.9	11.2	10.3	4.6	17.4	7.7	17.4
23:00 - 00:00	4.6	5.1	7.3	6.5	12.3	10.7	12.8
00:00 - 01:00	3.5	9.4	4.2	5.0	11.2	15.3	8.8
01:00 - 02:00	5.4	8.6	4.6	5.4	11.6	9.6	8.9
02:00 - 03:00	9.6	7.9	4.8	5.2	13.1	10.6	9.7
03:00 - 04:00	10.4	8.4	3.6	7.6	10.2	7.3	11.3
04:00 - 05:00	15.7	9.7	6.4	12.1	6.4	4.2	10.9
05:00 - 06:00	14.2	18.5	9.9	7.2	5.3	7.2	16.5
06:00 - 07:00	16.2	11.8	10.4	9.3	9.1	9.3	10.9
07:00 - 08:00	18.4	9.6	15.7	13.5	7.6	13.8	10.2
08:00 - 09:00	5.9	8.5	14.2	3.5	11.3	3.8	8.1
09:00 - 10:00	5.2	7.4	10.5	7.2	13.9	7.2	7.7
Average-24Hr*	9.0	9.9	9.9	8.6	10.6	9.9	11.7
Max-1Hr	18.4	18.5	18.6	16.3	17.4	16.2	22.3
Min-1Hr	3.6	4.7	3.6	3.8	5.2	3.8	6.5
Standard-1Hr	170 ppb(320 ug/cu.m)						
Standard-24Hr	-						

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

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team



## Ambient Air Monitoring Results : Nitrogen dioxide MTR-CPL

Location : Technology IRPC School	Monitor Period : 21-28 Mar 2022
Analyzer Model : API 200A	Station No : Mobile 10
Serial No : 1651	Site Operator : Mr.Supakit Tamooka
Calibrator Model : Teledyne 700E	Serial No : 587
Calibration Gas Cylinder I.D.: EB0108319	
Certified Date : 13 Jan 2022	Cal Concentration (ppb) : 0,100,200,400
Expire Date : 12 Jan 2023	

Time	NO2 Concentration (ppm)						
	21-22 Mar 2022	22-23 Mar 2022	23-24 Mar 2022	24-25 Mar 2022	25-26 Mar 2022	26-27 Mar 2022	27-28 Mar 2022
10:00 - 11:00	0.0084	0.0051	0.0073	0.0102	0.0099	0.0120	0.0099
11:00 - 12:00	0.0088	0.0047	0.0063	0.0088	0.0102	0.0034	0.0102
12:00 - 13:00	0.0094	0.0126	0.0040	0.0087	0.0065	0.0110	0.0065
13:00 - 14:00	0.0099	0.0105	0.0112	0.0126	0.0125	0.0162	0.0125
14:00 - 15:00	0.0095	0.0102	0.0149	0.0092	0.0093	0.0110	0.0093
15:00 - 16:00	0.0094	0.0088	0.0076	0.0099	0.0092	0.0108	0.0092
16:00 - 17:00	0.0077	0.0087	0.0082	0.0048	0.0157	0.0150	0.0166
17:00 - 18:00	0.0071	0.0073	0.0174	0.0069	0.0142	0.0125	0.0098
18:00 - 19:00	0.0118	0.0144	0.0142	0.0068	0.0162	0.0114	0.0162
19:00 - 20:00	0.0084	0.0168	0.0168	0.0142	0.0095	0.0122	0.0223
20:00 - 21:00	0.0057	0.0105	0.0188	0.0163	0.0073	0.0058	0.0152
21:00 - 22:00	0.0042	0.0108	0.0096	0.0111	0.0052	0.0063	0.0158
22:00 - 23:00	0.0059	0.0112	0.0105	0.0046	0.0174	0.0077	0.0174
23:00 - 00:00	0.0048	0.0051	0.0073	0.0065	0.0123	0.0107	0.0128
00:00 - 01:00	0.0036	0.0094	0.0042	0.0050	0.0112	0.0153	0.0088
01:00 - 02:00	0.0064	0.0086	0.0046	0.0054	0.0116	0.0096	0.0089
02:00 - 03:00	0.0096	0.0079	0.0046	0.0052	0.0131	0.0106	0.0097
03:00 - 04:00	0.0104	0.0084	0.0038	0.0076	0.0109	0.0073	0.0113
04:00 - 05:00	0.0157	0.0097	0.0064	0.0121	0.0064	0.0042	0.0109
05:00 - 06:00	0.0142	0.0185	0.0096	0.0072	0.0053	0.0072	0.0105
06:00 - 07:00	0.0162	0.0118	0.0104	0.0093	0.0091	0.0093	0.0109
07:00 - 08:00	0.0184	0.0096	0.0157	0.0138	0.0075	0.0138	0.0102
08:00 - 09:00	0.0059	0.0085	0.0142	0.0038	0.0113	0.0038	0.0081
09:00 - 10:00	0.0052	0.0074	0.0105	0.0072	0.0139	0.0072	0.0077
Average-24Hr*	0.0090	0.0099	0.0099	0.0083	0.0106	0.0099	0.0117
Max-1Hr	0.0184	0.0185	0.0186	0.0163	0.0174	0.0162	0.0223
Min-1Hr	0.0036	0.0047	0.0036	0.0038	0.0052	0.0038	0.0055
Standard-1Hr	0.17 ppm(320 ug/cu.m)						
Standard-24Hr	-						

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

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team



## Ambient Air Monitoring Results : Nitrogen dioxide MTR-CPL

Location : Moo4 of Ta-Phong Sub-District (North of Project Site)	Monitor Period : 21-28 Mar 2022
Analyzer Model : API 200A	Station No : SS2-08
Serial No : 144	Site Operator : Mr.Supakit Tamooka
Calibrator Model : Teledyne 700E	Serial No : 587
Calibration Gas Cylinder I.D.: EB0108319	
Certified Date : 13 Jan 2022	Cal Concentration (ppb) : 0,100,200,400
Expire Date : 12 Jan 2023	

Time	NO2 Concentration (ppb)						
	21-22 Mar 2022	22-23 Mar 2022	23-24 Mar 2022	24-25 Mar 2022	25-26 Mar 2022	26-27 Mar 2022	27-28 Mar 2022
11:00 - 12:00	12.5	7.0	11.8	17.6	7.6	11.7	11.5
12:00 - 13:00	9.1	10.6	12.3	16.1	12.6	11.7	12.5
13:00 - 14:00	7.7	11.6	14.9	15.5	10.8	13.6	16.9
14:00 - 15:00	11.7	14.2	16.3	13.3	9.8	18.0	18.8
15:00 - 16:00	18.0	16.8	17.1	17.7	9.6	18.1	14.9
16:00 - 17:00	14.3	8.9	18.8	11.9	8.3	18.5	16.3
17:00 - 18:00	12.9	8.9	11.5	10.6	7.8	17.6	17.1
18:00 - 19:00	10.4	11.5	11.2	9.7	15.5	16.7	6.9
19:00 - 20:00	4.6	13.0	12.6	9.2	18.5	15.4	7.6
20:00 - 21:00	4.3	17.4	3.5	12.5	20.7	12.1	6.8
21:00 - 22:00	4.1	6.1	4.3	9.1	17.6	9.8	6.9
22:00 - 23:00	4.1	7.0	6.2	7.7	16.7	9.6	6.4
23:00 - 00:00	3.4	3.2	7.8	7.2	15.4	6.3	2.4
00:00 - 01:00	3.8	7.7	6.7	4.3	12.1	6.2	2.1
01:00 - 02:00	2.8	8.6	6.1	4.8	9.8	8.4	1.9
02:00 - 03:00	3.0	8.7	8.2	5.0	9.6	5.5	2.1
03:00 - 04:00	3.0	10.8	9.8	4.8	6.3	4.3	2.0
04:00 - 05:00	2.7	5.0	9.6	5.0	6.2	6.2	1.8
05:00 - 06:00	2.6	8.3	5.3	4.6	8.4	8.0	1.3
06:00 - 07:00	2.4	6.2	5.2	9.6	6.1	9.9	6.2
07:00 - 08:00	8.0	8.4	8.4	7.6	7.6	11.8	8.4
08:00 - 09:00	17.7	5.5	15.4	7.2	8.9	11.5	5.5
09:00 - 10:00	11.9	8.0	17.6	6.1	8.5	9.9	5.1
10:00 - 11:00	10.6	9.9	19.8	9.6	10.5	11.8	7.8
Average-24Hr*	7.7	9.3	10.9	9.5	11.2	11.3	7.9
Max-1Hr	18.0	17.4	19.8	17.7	20.7	18.5	18.6
Min-1Hr	2.4	5.0	4.3	4.5	6.1	4.3	1.8
Standard-1Hr	170 ppb(320 ug/cu.m)						
Standard-24Hr	-						

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

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team



## Ambient Air Monitoring Results : Nitrogen dioxide MTR-CPL

Location : Moo4 of Ta-Phong Sub-District (North of Project Site)	Monitor Period : 21-28 Mar 2022
Analyzer Model : API 200A	Station No : SS2-08
Serial No : 144	Site Operator : Mr.Supakit Tamooka
Calibrator Model : Teledyne 700E	Serial No : 587
Calibration Gas Cylinder I.D.: EB0108319	
Certified Date : 13 Jan 2022	Cal Concentration (ppb) : 0,100,200,400
Expire Date : 12 Jan 2023	

Time	NO2 Concentration (ppm)						
	21-22 Mar 2022	22-23 Mar 2022	23-24 Mar 2022	24-25 Mar 2022	25-26 Mar 2022	26-27 Mar 2022	27-28 Mar 2022
11:00 - 12:00	0.0125	0.0070	0.0118	0.0176	0.0076	0.0117	0.0115
12:00 - 13:00	0.0091	0.0106	0.0123	0.0161	0.0126	0.0117	0.0125
13:00 - 14:00	0.0077	0.0116	0.0149	0.0185	0.0108	0.0138	0.0169
14:00 - 15:00	0.0117	0.0143	0.0163	0.0133	0.0086	0.0160	0.0188
15:00 - 16:00	0.0180	0.0168	0.0171	0.0177	0.0096	0.0181	0.0149
16:00 - 17:00	0.0143	0.0089	0.0185	0.0119	0.0083	0.0185	0.0163
17:00 - 18:00	0.0129	0.0089	0.0115	0.0108	0.0075	0.0178	0.0171
18:00 - 19:00	0.0104	0.0115	0.0112	0.0097	0.0185	0.0167	0.0069
19:00 - 20:00	0.0046	0.0130	0.0128	0.0092	0.0185	0.0154	0.0076
20:00 - 21:00	0.0043	0.0174	0.0055	0.0125	0.0207	0.0121	0.0068
21:00 - 22:00	0.0041	0.0061	0.0043	0.0091	0.0178	0.0098	0.0059
22:00 - 23:00	0.0041	0.0070	0.0062	0.0077	0.0167	0.0096	0.0064
23:00 - 00:00	0.0034	0.0052	0.0076	0.0072	0.0154	0.0063	0.0024
00:00 - 01:00	0.0038	0.0077	0.0067	0.0045	0.0121	0.0082	0.0021
01:00 - 02:00	0.0028	0.0086	0.0061	0.0048	0.0098	0.0084	0.0019
02:00 - 03:00	0.0030	0.0087	0.0062	0.0050	0.0096	0.0055	0.0021
03:00 - 04:00	0.0030	0.0108	0.0098	0.0048	0.0063	0.0043	0.0020
04:00 - 05:00	0.0027	0.0050	0.0096	0.0050	0.0062	0.0062	0.0018
05:00 - 06:00	0.0026	0.0063	0.0063	0.0046	0.0084	0.0080	0.0018
06:00 - 07:00	0.0024	0.0062	0.0062	0.0096	0.0061	0.0099	0.0062
07:00 - 08:00	0.0080	0.0084	0.0084	0.0078	0.0078	0.0118	0.0084
08:00 - 09:00	0.0177	0.0055	0.0154	0.0072	0.0089	0.0115	0.0055
09:00 - 10:00	0.0119	0.0080	0.0176	0.0061	0.0088	0.0099	0.0061
10:00 - 11:00	0.0108	0.0099	0.0198	0.0095	0.0105	0.0118	0.0078
Average-24Hr*	0.0077	0.0093	0.0109	0.0095	0.0112	0.0113	0.0079
Max-1Hr	0.0180	0.0174	0.0198	0.0177	0.0207	0.0185	0.0186
Min-1Hr	0.0024	0.0050	0.0043	0.0045	0.0061	0.0043	0.0018
Standard-1Hr	0.17 ppm(320 ug/cu.m)						
Standard-24Hr	-						

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

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team



## Ambient Air Monitoring Results : Sulfur dioxide MTR-CPL

Location : Technology IRPC School      Monitor Period : 21-28 Mar 2022  
Analyzer Model : API 100A      Station No : Mobile 10  
Serial No : 1715      Site Operator : Mr.Supakit Tamooka

Calibrator Model : Teledyne 700E      Serial No : 587  
Calibration Gas Cylinder I.D.: EB0108319  
Certified Date : 13 Jan 2022      Cal Concentration (ppb) : 0,100,200,400  
Expire Date : 12 Jan 2023

Time	SO2 Concentration (ppb)						
	21-22 Mar 2022	22-23 Mar 2022	23-24 Mar 2022	24-25 Mar 2022	25-26 Mar 2022	26-27 Mar 2022	27-28 Mar 2022
10:00 - 11:00	1.1	3.6	2.8	3.6	2.9	1.6	3.0
11:00 - 12:00	1.1	3.2	2.0	3.2	2.0	0.3	2.6
12:00 - 13:00	1.0	3.1	2.3	3.1	3.5	0.7	2.6
13:00 - 14:00	0.9	2.2	2.2	2.6	2.5	0.3	2.8
14:00 - 15:00	0.5	1.6	2.1	2.2	2.6	1.1	3.3
15:00 - 16:00	0.6	1.7	2.1	3.5	2.3	7.5	3.1
16:00 - 17:00	0.5	1.8	1.0	4.0	4.6	6.9	2.8
17:00 - 18:00	0.9	1.3	1.4	3.3	0.1	1.9	3.2
18:00 - 19:00	1.0	3.3	0.8	3.2	0.4	1.6	3.3
19:00 - 20:00	1.1	3.3	1.0	2.2	2.8	1.6	3.1
20:00 - 21:00	1.3	3.6	1.5	1.7	2.9	1.8	6.1
21:00 - 22:00	1.4	3.5	1.0	1.7	2.2	2.0	0.8
22:00 - 23:00	1.2	2.2	1.1	1.6	3.5	2.1	0.9
23:00 - 00:00	1.3	1.7	1.4	1.8	2.7	1.8	1.0
00:00 - 01:00	4.4	1.7	0.9	3.8	2.2	1.8	1.1
01:00 - 02:00	2.4	1.8	0.2	3.7	2.1	2.2	1.3
02:00 - 03:00	1.6	1.8	3.3	3.4	1.6	2.2	1.4
03:00 - 04:00	3.5	3.8	2.2	3.2	2.7	2.1	1.2
04:00 - 05:00	4.7	3.7	2.0	3.7	3.3	1.9	1.3
05:00 - 06:00	2.1	3.4	3.5	0.2	2.9	2.3	1.5
06:00 - 07:00	2.8	3.2	2.8	0.1	3.1	2.5	1.6
07:00 - 08:00	3.2	2.3	3.2	0.3	3.1	2.6	5.1
08:00 - 09:00	3.9	1.7	3.9	1.6	2.7	2.6	4.6
09:00 - 10:00	4.0	3.7	4.0	2.3	3.6	3.3	5.9
Average-24Hr*	2.0	2.6	2.0	2.5	2.6	2.3	2.7
Max-1Hr	4.7	3.8	4.0	4.0	4.6	7.5	6.1
Min-1Hr	0.5	1.3	0.2	0.1	0.1	0.3	0.8
Standard-1Hr	300 ppb(780 ug/cu.m)						
Standard-24Hr	120 ppb(300 ug/cu.m)						

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

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team



## Ambient Air Monitoring Results : Sulfur dioxide MTR-CPL

Location : Technology IRPC School      Monitor Period : 21-28 Mar 2022  
Analyzer Model : API 100A      Station No : Mobile 10  
Serial No : 1715      Site Operator : Mr.Supakit Tamooka

Calibrator Model : Teledyne 700E      Serial No : 587  
Calibration Gas Cylinder I.D.: EB0108319  
Certified Date : 13 Jan 2022      Cal Concentration (ppb) : 0,100,200,400  
Expire Date : 12 Jan 2023

Time	SO2 Concentration (ppm)						
	21-22 Mar 2022	22-23 Mar 2022	23-24 Mar 2022	24-25 Mar 2022	25-26 Mar 2022	26-27 Mar 2022	27-28 Mar 2022
10:00 - 11:00	0.0011	0.0036	0.0028	0.0036	0.0029	0.0016	0.0030
11:00 - 12:00	0.0011	0.0032	0.0020	0.0032	0.0020	0.0003	0.0026
12:00 - 13:00	0.0010	0.0031	0.0023	0.0031	0.0025	0.0007	0.0026
13:00 - 14:00	0.0009	0.0022	0.0022	0.0026	0.0023	0.0003	0.0028
14:00 - 15:00	0.0003	0.0016	0.0021	0.0023	0.0026	0.0011	0.0033
15:00 - 16:00	0.0006	0.0017	0.0021	0.0035	0.0023	0.0075	0.0031
16:00 - 17:00	0.0008	0.0018	0.0010	0.0040	0.0046	0.0069	0.0028
17:00 - 18:00	0.0009	0.0013	0.0014	0.0033	0.0001	0.0019	0.0032
18:00 - 19:00	0.0010	0.0033	0.0006	0.0032	0.0004	0.0016	0.0033
19:00 - 20:00	0.0011	0.0033	0.0010	0.0022	0.0028	0.0016	0.0031
20:00 - 21:00	0.0013	0.0036	0.0015	0.0017	0.0029	0.0018	0.0061
21:00 - 22:00	0.0014	0.0035	0.0010	0.0017	0.0022	0.0020	0.0008
22:00 - 23:00	0.0012	0.0022	0.0011	0.0018	0.0035	0.0021	0.0009
23:00 - 00:00	0.0013	0.0017	0.0014	0.0018	0.0027	0.0018	0.0010
00:00 - 01:00	0.0044	0.0017	0.0009	0.0038	0.0022	0.0018	0.0011
01:00 - 02:00	0.0024	0.0018	0.0002	0.0037	0.0021	0.0022	0.0013
02:00 - 03:00	0.0016	0.0018	0.0033	0.0034	0.0016	0.0022	0.0014
03:00 - 04:00	0.0035	0.0038	0.0022	0.0032	0.0027	0.0021	0.0012
04:00 - 05:00	0.0047	0.0037	0.0020	0.0037	0.0033	0.0019	0.0013
05:00 - 06:00	0.0021	0.0034	0.0025	0.0002	0.0029	0.0023	0.0015
06:00 - 07:00	0.0028	0.0032	0.0028	0.0001	0.0031	0.0025	0.0018
07:00 - 08:00	0.0032	0.0023	0.0032	0.0003	0.0031	0.0026	0.0051
08:00 - 09:00	0.0039	0.0017	0.0039	0.0016	0.0027	0.0026	0.0045
09:00 - 10:00	0.0040	0.0027	0.0040	0.0023	0.0036	0.0023	0.0059
Average-24Hr*	0.0020	0.0026	0.0020	0.0025	0.0026	0.0023	0.0027
Max-1Hr	0.0047	0.0038	0.0040	0.0040	0.0046	0.0075	0.0061
Min-1Hr	0.0003	0.0013	0.0002	0.0001	0.0001	0.0003	0.0008
Standard-1Hr	0.30 ppm(780 ug/cu.m)						
Standard-24Hr	0.12 ppm(300 ug/cu.m)						

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

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team



## Ambient Air Monitoring Results : Sulfur dioxide MTR-CPL

Location : Moo4 of Ta-Phong Sub-District (North of Project Site) Monitor Period : 21-28 Mar 2022  
Analyzer Model : API 100A Station No : SS2-08  
Serial No : 069 Site Operator : Mr.Supakit Tamooka

Calibrator Model : Teledyne 700E Serial No : 587  
Calibration Gas Cylinder I.D.: EB0108319  
Certified Date : 13 Jan 2022 Cal Concentration (ppb) : 0,100,200,400  
Expire Date : 12 Jan 2023

Time	SO2 Concentration (ppb)						
	21-22 Mar 2022	22-23 Mar 2022	23-24 Mar 2022	24-25 Mar 2022	25-26 Mar 2022	26-27 Mar 2022	27-28 Mar 2022
11:00 - 12:00	0.7	0.6	0.3	1.2	0.1	1.8	1.3
12:00 - 13:00	0.2	3.7	0.6	1.2	0.8	2.7	1.3
13:00 - 14:00	0.7	3.1	0.7	0.7	1.3	2.3	1.4
14:00 - 15:00	2.6	1.3	0.3	0.6	1.7	2.6	1.5
15:00 - 16:00	5.8	1.7	0.2	0.4	2.6	3.7	1.5
16:00 - 17:00	1.6	1.6	1.3	0.4	2.1	3.1	1.6
17:00 - 18:00	2.8	2.1	1.3	0.6	3.5	1.3	1.4
18:00 - 19:00	2.3	1.5	0.8	2.7	2.2	1.7	1.5
19:00 - 20:00	2.2	1.2	1.3	2.7	2.0	1.6	1.6
20:00 - 21:00	1.9	1.7	2.8	1.6	1.5	2.1	1.1
21:00 - 22:00	1.3	2.6	2.3	1.3	1.8	1.5	1.9
22:00 - 23:00	1.5	0.3	2.2	1.8	1.2	1.2	2.7
23:00 - 00:00	1.5	0.7	1.9	1.4	1.6	1.7	2.4
00:00 - 01:00	1.7	1.4	1.3	2.7	2.9	2.6	2.7
01:00 - 02:00	2.4	1.0	1.5	1.1	2.1	0.3	2.7
02:00 - 03:00	1.4	0.2	1.5	1.2	1.9	0.7	1.8
03:00 - 04:00	1.5	0.8	1.7	1.6	1.3	1.4	1.3
04:00 - 05:00	1.1	0.4	2.4	1.1	1.5	1.0	1.8
05:00 - 06:00	2.4	1.4	1.4	0.8	0.7	0.2	1.4
06:00 - 07:00	3.0	1.9	1.5	1.2	0.9	0.8	2.7
07:00 - 08:00	1.7	1.4	1.1	1.7	0.5	0.4	1.1
08:00 - 09:00	1.2	1.3	2.4	1.6	0.1	1.4	1.2
09:00 - 10:00	1.2	1.2	3.0	2.0	0.5	1.9	1.6
10:00 - 11:00	0.7	0.6	1.7	1.1	1.4	1.4	1.1

Average-24Hr*	1.8	1.4	1.5	1.4	1.5	1.6	1.7
Max-1Hr	5.8	3.7	3.0	2.7	3.5	3.7	2.7
Min-1Hr	0.2	0.2	0.2	0.4	0.1	0.2	1.1

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

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

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team



## Ambient Air Monitoring Results : Sulfur dioxide MTR-CPL

Location : Moo4 of Ta-Phong Sub-District (North of Project Site) Monitor Period : 21-28 Mar 2022  
Analyzer Model : API 100A Station No : SS2-08  
Serial No : 069 Site Operator : Mr.Supakit Tamooka

Calibrator Model : Teledyne 700E Serial No : 587  
Calibration Gas Cylinder I.D.: EB0108319  
Certified Date : 13 Jan 2022 Cal Concentration (ppb) : 0,100,200,400  
Expire Date : 12 Jan 2023

Time	SO2 Concentration (ppm)						
	21-22 Mar 2022	22-23 Mar 2022	23-24 Mar 2022	24-25 Mar 2022	25-26 Mar 2022	26-27 Mar 2022	27-28 Mar 2022
11:00 - 12:00	0.0007	0.0006	0.0003	0.0012	0.0001	0.0018	0.0013
12:00 - 13:00	0.0002	0.0037	0.0006	0.0012	0.0008	0.0027	0.0013
13:00 - 14:00	0.0007	0.0031	0.0007	0.0007	0.0013	0.0023	0.0014
14:00 - 15:00	0.0026	0.0013	0.0003	0.0008	0.0017	0.0028	0.0015
15:00 - 16:00	0.0058	0.0017	0.0002	0.0004	0.0026	0.0037	0.0015
16:00 - 17:00	0.0016	0.0016	0.0013	0.0004	0.0021	0.0031	0.0016
17:00 - 18:00	0.0028	0.0021	0.0013	0.0008	0.0035	0.0013	0.0014
18:00 - 19:00	0.0028	0.0015	0.0008	0.0027	0.0022	0.0017	0.0015
19:00 - 20:00	0.0022	0.0012	0.0013	0.0027	0.0020	0.0016	0.0016
20:00 - 21:00	0.0019	0.0017	0.0028	0.0013	0.0015	0.0021	0.0011
21:00 - 22:00	0.0013	0.0028	0.0023	0.0015	0.0016	0.0015	0.0019
22:00 - 23:00	0.0015	0.0003	0.0022	0.0018	0.0012	0.0012	0.0027
23:00 - 00:00	0.0015	0.0007	0.0019	0.0014	0.0016	0.0017	0.0024
00:00 - 01:00	0.0017	0.0014	0.0013	0.0027	0.0029	0.0026	0.0027
01:00 - 02:00	0.0024	0.0010	0.0015	0.0011	0.0021	0.0003	0.0027
02:00 - 03:00	0.0014	0.0002	0.0015	0.0012	0.0019	0.0007	0.0016
03:00 - 04:00	0.0015	0.0008	0.0017	0.0016	0.0013	0.0014	0.0013
04:00 - 05:00	0.0011	0.0004	0.0024	0.0011	0.0015	0.0010	0.0018
05:00 - 06:00	0.0024	0.0014	0.0014	0.0008	0.0007	0.0002	0.0014
06:00 - 07:00	0.0030	0.0019	0.0015	0.0012	0.0009	0.0002	0.0027
07:00 - 08:00	0.0017	0.0014	0.0011	0.0017	0.0005	0.0004	0.0011
08:00 - 09:00	0.0012	0.0013	0.0024	0.0018	0.0001	0.0014	0.0012
09:00 - 10:00	0.0012	0.0012	0.0030	0.0020	0.0005	0.0019	0.0016
10:00 - 11:00	0.0007	0.0006	0.0017	0.0011	0.0014	0.0014	0.0011

Average-24Hr*	0.0018	0.0014	0.0015	0.0014	0.0015	0.0016	0.0017
Max-1Hr	0.0058	0.0037	0.0030	0.0027	0.0035	0.0027	0.0027
Min-1Hr	0.0002	0.0002	0.0002	0.0004	0.0001	0.0002	0.0011

Standard-1Hr 0.30 ppm(780 ug/cu.m)  
Standard-24Hr 0.12 ppm(300 ug/cu.m)

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

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team



## Ambient Air Monitoring Results : Carbon monoxide MTR-CPL

Location : Moo4 of Ta-Phong Sub-District (North of Project Site) Monitor Period : 21-28 Mar 2022  
Analyzer Model : Thermo 48C Station No : SS2-08  
Serial No : 362 Site Operator : Mr.Supakit Tamooka

Calibrator Model : Teledyne 700E Serial No : 587  
Calibration Gas Cylinder I.D.: EB0108319  
Certified Date : 13 Jan 2022 Cal Concentration (ppb) : 0,100,200,400  
Expire Date : 12 Jan 2023

Time	CO Concentration (ppm)						
	21-22 Mar 2022	22-23 Mar 2022	23-24 Mar 2022	24-25 Mar 2022	25-26 Mar 2022	26-27 Mar 2022	27-28 Mar 2022
11:00 - 12:00	0.3	0.2	0.2	0.4	1.0	0.3	0.4
12:00 - 13:00	0.2	0.2	0.2	0.3	0.4	0.5	0.2
13:00 - 14:00	0.1	0.3	0.2	0.2	0.3	0.3	0.3
14:00 - 15:00	0.2	0.1	0.3	0.3	0.2	0.4	0.3
15:00 - 16:00	0.1	0.1	0.2	0.2	0.2	0.4	0.2
16:00 - 17:00	0.1	0.1	0.3	0.3	0.2	0.4	0.2
17:00 - 18:00	0.3	0.2	0.3	0.3	0.2	0.5	0.2
18:00 - 19:00	0.2	0.3	0.3	0.4	0.3	0.5	0.2
19:00 - 20:00	0.4	0.4	0.5	0.6	0.3	0.6	0.2
20:00 - 21:00	0.4	0.6	0.6	0.5	0.4	0.5	0.1
21:00 - 22:00	0.5	0.5	0.5	0.5	0.4	0.5	0.1
22:00 - 23:00	0.4	0.5	0.5	0.5	0.4	0.6	0.2
23:00 - 00:00	0.5	0.5	0.6	0.4	0.4	0.6	0.3
00:00 - 01:00	0.4	0.4	0.6	0.5	0.5	0.5	0.2
01:00 - 02:00	0.4	0.5	0.5	0.6	0.4	0.4	0.2
02:00 - 03:00	0.4	0.4	0.4	0.5	0.4	0.4	0.2
03:00 - 04:00	0.3	0.4	0.4	0.4	0.5	0.4	0.3
04:00 - 05:00	0.3	0.5	0.3	0.5	0.4	0.4	0.3
05:00 - 06:00	0.3	0.4	0.4	0.5	0.3	0.3	0.2
06:00 - 07:00	0.4	0.4	0.3	0.5	0.3	0.4	0.2
07:00 - 08:00	0.3	0.5	0.4	0.6	0.4	0.4	0.1
08:00 - 09:00	0.5	0.5	0.3	0.5	0.5	0.3	0.1
09:00 - 10:00	0.3	0.4	0.3	0.4	0.4	0.3	0.1
10:00 - 11:00	0.3	0.3	0.3	0.4	0.3	0.3	0.2
Average-24Hr*	0.3	0.4	0.4	0.4	0.4	0.4	0.2
Max-1Hr	0.5	0.6	0.6	0.6	1.0	0.6	0.4
Min-1Hr	0.1	0.1	0.2	0.2	0.2	0.3	0.1
Standard-1Hr	30 ppm(34.2 mg/cu.m)						
Standard-24Hr	-						

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

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team



## Ambient Air Monitoring Results : Carbon monoxide MTR-CPL

Location : Moo4 of Ta-Phong Sub-District (North of Project Site) Monitor Period : 21-28 Mar 2022  
Analyzer Model : Thermo 48C Station No : SS2-08  
Serial No : 362 Site Operator : Mr.Supakit Tamooka

Calibrator Model : Teledyne 700E Serial No : 587  
Calibration Gas Cylinder I.D.: EB0108319  
Certified Date : 13 Jan 2022 Cal Concentration (ppb) : 0,100,200,400  
Expire Date : 12 Jan 2023

Time	CO Concentration (ppb)						
	21-22 Mar 2022	22-23 Mar 2022	23-24 Mar 2022	24-25 Mar 2022	25-26 Mar 2022	26-27 Mar 2022	27-28 Mar 2022
11:00 - 12:00	300.0	200.0	200.0	400.0	1000.0	300.0	400.0
12:00 - 13:00	200.0	200.0	200.0	300.0	400.0	500.0	200.0
13:00 - 14:00	100.0	300.0	200.0	200.0	300.0	300.0	300.0
14:00 - 15:00	200.0	100.0	300.0	300.0	200.0	400.0	300.0
15:00 - 16:00	100.0	100.0	200.0	200.0	200.0	400.0	200.0
16:00 - 17:00	100.0	100.0	300.0	300.0	200.0	400.0	200.0
17:00 - 18:00	300.0	200.0	300.0	300.0	200.0	500.0	200.0
18:00 - 19:00	200.0	300.0	300.0	400.0	300.0	500.0	200.0
19:00 - 20:00	400.0	400.0	500.0	600.0	300.0	600.0	200.0
20:00 - 21:00	400.0	600.0	600.0	500.0	400.0	500.0	100.0
21:00 - 22:00	500.0	500.0	500.0	500.0	400.0	500.0	100.0
22:00 - 23:00	400.0	500.0	500.0	500.0	400.0	600.0	200.0
23:00 - 00:00	500.0	500.0	600.0	400.0	400.0	600.0	300.0
00:00 - 01:00	400.0	400.0	600.0	500.0	500.0	500.0	200.0
01:00 - 02:00	400.0	500.0	500.0	600.0	400.0	400.0	200.0
02:00 - 03:00	400.0	400.0	400.0	500.0	400.0	400.0	200.0
03:00 - 04:00	300.0	400.0	400.0	400.0	500.0	400.0	300.0
04:00 - 05:00	300.0	500.0	300.0	500.0	400.0	400.0	300.0
05:00 - 06:00	300.0	400.0	400.0	500.0	300.0	300.0	200.0
06:00 - 07:00	400.0	400.0	300.0	500.0	300.0	400.0	200.0
07:00 - 08:00	500.0	500.0	400.0	500.0	400.0	400.0	100.0
08:00 - 09:00	500.0	500.0	300.0	500.0	500.0	300.0	100.0
09:00 - 10:00	300.0	400.0	300.0	400.0	400.0	300.0	100.0
10:00 - 11:00	300.0	300.0	300.0	400.0	300.0	300.0	200.0
Average-24Hr*	300.0	400.0	400.0	400.0	400.0	400.0	200.0
Max-1Hr	500.0	600.0	600.0	600.0	1000.0	600.0	400.0
Min-1Hr	100.0	100.0	200.0	200.0	200.0	300.0	100.0
Standard-1Hr	30000 ppb(34.2 mg/cu.m)						
Standard-24Hr	-						

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

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team





## Ambient Air Monitoring Results : Carbon monoxide MTR-CPL

Location : Technology IRPC School Monitor Period : 21-28 Mar 2022  
Analyzer Model : Teledyne 300E Station No : Mobile 10  
Serial No : 924 Site Operator : Mr.Supakit Tamooka

Calibrator Model : Teledyne 700E Serial No : 587  
Calibration Gas Cylinder I.D.: EB0108319  
Certified Date : 13 Jan 2022 Cal Concentration (ppb) : 0,100,200,400  
Expire Date : 12 Jan 2023

Time	CO Concentration (ppm)						
	21-22 Mar 2022	22-23 Mar 2022	23-24 Mar 2022	24-25 Mar 2022	25-26 Mar 2022	26-27 Mar 2022	27-28 Mar 2022
10:00 - 11:00	0.2	0.1	0.1	1.7	0.2	0.3	0.3
11:00 - 12:00	0.1	0.2	0.1	2.1	0.2	0.4	0.2
12:00 - 13:00	0.1	0.1	0.2	1.8	0.2	0.3	0.2
13:00 - 14:00	0.1	0.1	0.1	1.4	0.3	0.3	0.2
14:00 - 15:00	0.3	0.1	0.1	1.2	0.5	0.3	0.2
15:00 - 16:00	0.2	0.3	0.1	1.0	0.5	0.3	0.3
16:00 - 17:00	0.2	0.5	0.2	0.9	0.6	0.4	0.2
17:00 - 18:00	0.1	0.2	0.1	0.8	0.1	0.3	0.2
18:00 - 19:00	0.2	0.2	0.2	0.7	0.2	0.3	0.2
19:00 - 20:00	0.2	0.1	0.3	0.6	0.1	0.4	0.2
20:00 - 21:00	0.2	0.1	0.2	0.7	0.3	0.4	0.4
21:00 - 22:00	0.2	0.8	0.3	0.7	0.1	0.4	0.3
22:00 - 23:00	0.1	0.1	0.2	0.6	0.2	0.2	0.2
23:00 - 00:00	0.1	0.1	0.1	0.5	0.2	0.3	0.3
00:00 - 01:00	0.2	0.1	0.2	0.4	0.1	0.2	0.2
01:00 - 02:00	0.1	0.1	0.1	0.3	0.1	0.2	0.2
02:00 - 03:00	0.1	0.2	0.2	0.2	0.1	0.2	0.2
03:00 - 04:00	0.2	0.1	0.1	0.2	0.2	0.3	0.3
04:00 - 05:00	0.1	0.1	0.2	0.1	0.1	0.2	0.1
05:00 - 06:00	0.2	0.1	0.2	0.2	0.2	0.3	0.2
06:00 - 07:00	0.2	0.3	0.2	0.1	0.5	0.2	0.2
07:00 - 08:00	0.1	0.2	0.3	0.3	0.4	0.2	0.2
08:00 - 09:00	0.2	0.2	0.2	0.3	0.2	0.2	0.2
09:00 - 10:00	0.2	0.1	0.2	0.2	0.2	0.3	0.2

Average-24Hr*	0.2	0.2	0.2	0.7	0.2	0.3	0.2
Max-1Hr	0.3	0.8	0.3	2.1	0.5	0.4	0.4
Min-1Hr	0.1	0.1	0.1	0.1	0.1	0.2	0.1

Standard-1Hr	30 ppm(34.2 mg/cu.m)						
Standard-24Hr	-						

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

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

Preeda S.  
(Miss Preeda Somjai)  
Technical Management Team



## Ambient Air Monitoring Results : Carbon monoxide MTR-CPL

Location : Technology IRPC School Monitor Period : 21-28 Mar 2022  
Analyzer Model : Teledyne 300E Station No : Mobile 10  
Serial No : 924 Site Operator : Mr.Supakit Tamooka

Calibrator Model : Teledyne 700E Serial No : 587  
Calibration Gas Cylinder I.D.: EB0108319  
Certified Date : 13 Jan 2022 Cal Concentration (ppb) : 0,100,200,400  
Expire Date : 12 Jan 2023

Time	CO Concentration (ppb)						
	21-22 Mar 2022	22-23 Mar 2022	23-24 Mar 2022	24-25 Mar 2022	25-26 Mar 2022	26-27 Mar 2022	27-28 Mar 2022
10:00 - 11:00	200.0	100.0	100.0	1700.0	200.0	200.0	300.0
11:00 - 12:00	100.0	200.0	100.0	2100.0	200.0	400.0	200.0
12:00 - 13:00	100.0	100.0	200.0	1800.0	200.0	300.0	200.0
13:00 - 14:00	100.0	100.0	100.0	1400.0	500.0	300.0	200.0
14:00 - 15:00	300.0	100.0	100.0	1200.0	500.0	300.0	200.0
15:00 - 16:00	200.0	300.0	100.0	1000.0	500.0	300.0	300.0
16:00 - 17:00	200.0	500.0	200.0	900.0	600.0	400.0	200.0
17:00 - 18:00	100.0	200.0	100.0	800.0	100.0	300.0	200.0
18:00 - 19:00	200.0	200.0	200.0	700.0	200.0	300.0	200.0
19:00 - 20:00	200.0	100.0	300.0	600.0	100.0	400.0	200.0
20:00 - 21:00	200.0	100.0	200.0	700.0	200.0	400.0	400.0
21:00 - 22:00	200.0	800.0	300.0	700.0	100.0	400.0	300.0
22:00 - 23:00	100.0	100.0	200.0	600.0	200.0	300.0	200.0
23:00 - 00:00	100.0	100.0	100.0	500.0	200.0	300.0	300.0
00:00 - 01:00	200.0	100.0	200.0	400.0	100.0	200.0	200.0
01:00 - 02:00	100.0	100.0	100.0	300.0	100.0	200.0	200.0
02:00 - 03:00	100.0	200.0	200.0	200.0	100.0	200.0	200.0
03:00 - 04:00	200.0	100.0	100.0	200.0	300.0	300.0	300.0
04:00 - 05:00	100.0	100.0	200.0	100.0	100.0	200.0	100.0
05:00 - 06:00	200.0	100.0	200.0	200.0	200.0	300.0	200.0
06:00 - 07:00	200.0	300.0	200.0	100.0	500.0	200.0	200.0
07:00 - 08:00	100.0	200.0	300.0	300.0	400.0	200.0	200.0
08:00 - 09:00	200.0	200.0	200.0	300.0	200.0	200.0	200.0
09:00 - 10:00	200.0	100.0	200.0	200.0	200.0	300.0	200.0

Average-24Hr*	200.0	200.0	300.0	700.0	200.0	300.0	200.0
Max-1Hr	300.0	800.0	300.0	2100.0	600.0	400.0	400.0
Min-1Hr	100.0	100.0	100.0	100.0	100.0	200.0	100.0

Standard-1Hr	30000 ppb(34.2 mg/cu.m)						
Standard-24Hr	-						

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

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

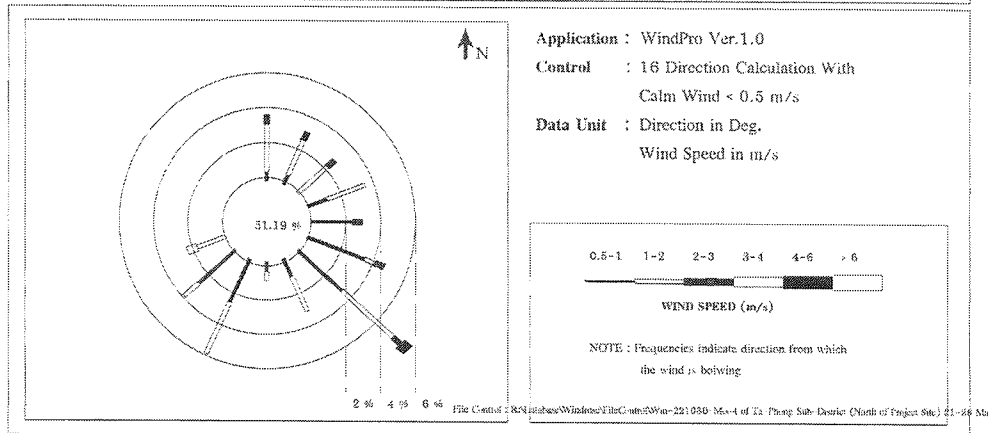
Preeda S.  
(Miss Preeda Somjai)  
Technical Management Team



## Meteorological Monitoring Results : Wind Rose MTR-CPL

Location : Moo4 of Ta-Phong Sub-District (North of Project Site) Monitor period : 21-28 Mar 2022  
Wind Speed Model : NRG Symphonie Serial No : A4904  
Wind Direction Model : NRG Symphonie Serial No : A4904

Direction	Percentage of Occurrence of Wind Direct Grouped in Various Wind Speed						Total
	0.5-1 m/s	1-2 m/s	2-3 m/s	3-4 m/s	4-6 m/s	More than 6	
N	0.0060	0.0298	0.0060	0.0000	0.0000	0.0000	0.0417
NNE	0.0060	0.0238	0.0060	0.0000	0.0000	0.0000	0.0357
NE	0.0000	0.0238	0.0060	0.0000	0.0000	0.0000	0.0298
ENE	0.0119	0.0238	0.0000	0.0000	0.0000	0.0000	0.0357
E	0.0238	0.0000	0.0060	0.0000	0.0000	0.0000	0.0298
ESE	0.0357	0.0060	0.0060	0.0000	0.0000	0.0000	0.0476
SE	0.0357	0.0417	0.0060	0.0000	0.0060	0.0000	0.0893
SSE	0.0119	0.0238	0.0000	0.0000	0.0000	0.0000	0.0357
S	0.0060	0.0060	0.0000	0.0000	0.0000	0.0000	0.0119
SSW	0.0298	0.0357	0.0000	0.0000	0.0000	0.0000	0.0655
SW	0.0298	0.0119	0.0000	0.0000	0.0000	0.0000	0.0417
WSW	0.0000	0.0179	0.0000	0.0060	0.0000	0.0000	0.0238
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	0.5119						



(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

Preecha S.  
(Miss Preecha Somjai)  
Technical Management Team

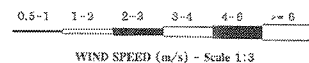


## Meteorological Monitoring Results : Wind Rose MTR-CPL

Location : Moo4 of Ta-Phong Sub-District (North of Project Site) Monitor period : 21-28 Mar 2022  
Wind Speed Model : NRG Symphonie Serial No : A4904  
Wind Direction Model : NRG Symphonie Serial No : A4904

Time	21-22 Mar 2022		22-23 Mar 2022		23-24 Mar 2022		24-25 Mar 2022	
	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD
11:00 - 12:00	0.0	WSW	0.6	S	0.6	SW	1.7	N
12:00 - 13:00	1.0	NE	1.9	SE	1.2	ESE	1.0	SSE
13:00 - 14:00	1.7	SSE	2.0	NNE	1.4	SSW	2.0	ESE
14:00 - 15:00	0.7	ESE	0.4	NE	0.5	SE	1.6	SW
15:00 - 16:00	1.5	WSW	0.8	SSW	0.0	SSW	1.4	SSW
16:00 - 17:00	1.2	SE	1.5	SE	0.0	SSW	0.8	SE
17:00 - 18:00	0.6	SW	1.0	ENE	1.0	N	1.4	SSW
18:00 - 19:00	0.7	NNE	0.0	N	0.2	NE	0.9	ESE
19:00 - 20:00	1.0	NE	0.0	SSE	0.0	SE	1.7	SSE
20:00 - 21:00	1.7	SSW	0.0	SSE	0.2	SE	0.0	SSE
21:00 - 22:00	0.0	NE	0.0	WSW	0.5	SSW	0.0	SSE
22:00 - 23:00	0.0	E	0.0	SSE	0.0	SW	0.0	N
23:00 - 24:00	0.0	S	0.0	ENE	0.0	WSW	0.0	S
00:00 - 01:00	0.0	NNE	0.0	ENE	0.0	S	0.0	SE
01:00 - 02:00	0.0	SW	0.0	ENE	0.0	WSW	0.0	NE
02:00 - 03:00	0.0	SSW	0.0	SSE	0.0	SE	0.0	SSE
03:00 - 04:00	0.0	SE	0.0	ESE	0.0	SSW	0.0	NNE
04:00 - 05:00	0.0	S	0.0	SE	0.0	WSW	0.0	SE
05:00 - 06:00	0.0	NE	0.0	N	0.0	SSW	0.0	S
06:00 - 07:00	0.0	NE	0.0	E	0.1	SSW	0.0	WSW
07:00 - 08:00	0.0	SSE	0.0	SSE	0.0	ESE	0.0	SE
08:00 - 09:00	0.0	E	0.0	E	0.5	SSW	0.0	SSW
09:00 - 10:00	0.0	N	0.7	SSW	1.2	ENE	0.9	SE
10:00 - 11:00	0.9	E	0.0	E	1.4	SE	0.4	NNE

Wind Rose



File Control : R:\Database\Windrose\FileControl\Win-221030-Mon-4 of Ta-Phong Sub-District (North of Project Site) 21-28 Mar 2022

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

Preecha S.  
(Miss Preecha Somjai)  
Technical Management Team

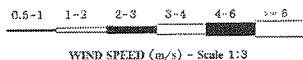
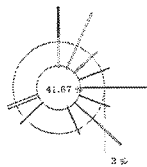
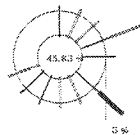
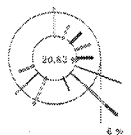


## Meteorological Monitoring Results : Wind Rose MTR-CPL

Location : Moo4 of Ta-Phong Sub-District (North of Project Site) Monitor period : 21-28 Mar 2022  
Wind Speed Model : NRG Symphonie Serial No : A4904  
Wind Direction Model : NRG Symphonie Serial No : A4904

Time	25-26 Mar 2022		26-27 Mar 2022		27-28 Mar 2022	
	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD
11:00 - 12:00	1.3	WSW	4.0	SE	3.0	WSW
12:00 - 13:00	1.6	N	1.4	SSE	0.9	
13:00 - 14:00	2.9	SE	1.1	NNE	1.6	NNE
14:00 - 15:00	1.1	ENE	1.5	ENE	1.7	SE
15:00 - 16:00	1.4	SE	1.7	WSW	1.2	NNE
16:00 - 17:00	1.2	SE	0.6	ENE	1.0	NE
17:00 - 18:00	1.6	SSW	0.7	SSW	0.0	N
18:00 - 19:00	0.0	SSE	0.8	SW	0.0	NNE
19:00 - 20:00	0.8	SSE	1.1	NE	2.0	N
20:00 - 21:00	0.0	ENE	0.5	SE	0.0	SE
21:00 - 22:00	0.7	ESE	0.4	SSW	1.3	N
22:00 - 23:00	1.7	N	0.7	N	0.2	SE
23:00 - 24:00	1.7	SSW	0.0	NNE	0.0	WSW
00:00 - 01:00	0.8	ESE	0.0	E	0.6	ESE
01:00 - 02:00	0.6	ESE	0.0	E	0.3	NNE
02:00 - 03:00	0.6	SW	0.0	E	0.9	SE
03:00 - 04:00	0.4	ESE	0.0	SSE	0.7	SW
04:00 - 05:00	0.0	NNE	0.0	SW	0.5	E
05:00 - 06:00	0.0	SW	0.0	WSW	0.0	SE
06:00 - 07:00	1.4	NNE	0.0	S	0.0	SE
07:00 - 08:00	2.0	NE	0.0	SSW	0.0	N
08:00 - 09:00	1.0	SW	0.0	SW	0.0	N
09:00 - 10:00	2.9	E	1.3	S	0.6	E
10:00 - 11:00	0.6	SE	0.5	E	0.8	SSE

Wind Rose



File Control : R:\Database\Windrose\FileControl\Win-221030-Moo4 of Ta-Phong Sub-District (North of Project Site) 21-28 Mar 2022

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

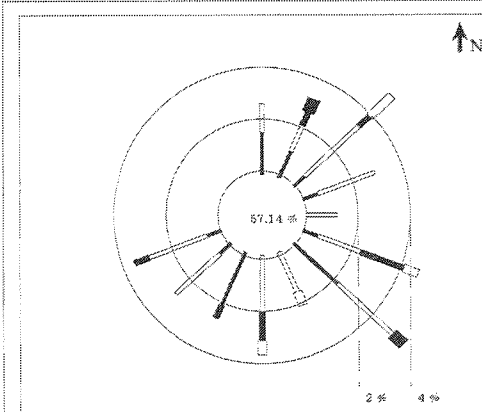
(Miss Preeda Somjai)  
Technical Management Team



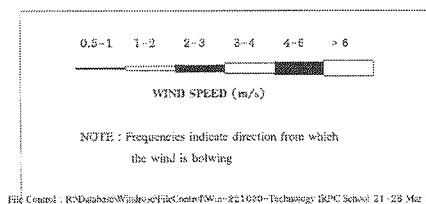
## Meteorological Monitoring Results : Wind Rose MTR-CPL

Location : Technology IRPC School Monitor period : 21-28 Mar 2022  
Wind Speed Model : NRG Symphonie Serial No : A5088  
Wind Direction Model : NRG Symphonie Serial No : A5088

Direction	Percentage of Occurrence of Wind Direct Grouped in Various Wind Speed						
	0.5-1 m/s	1-2 m/s	2-3 m/s	3-4 m/s	4-6 m/s	More than 6	Total
N	0.0179	0.0119	0.0000	0.0000	0.0000	0.0000	0.0298
NNE	0.0119	0.0119	0.0060	0.0000	0.0060	0.0000	0.0357
NE	0.0060	0.0298	0.0060	0.0119	0.0000	0.0000	0.0536
ENE	0.0060	0.0238	0.0000	0.0000	0.0000	0.0000	0.0298
E	0.0000	0.0119	0.0000	0.0000	0.0000	0.0000	0.0119
ESE	0.0060	0.0179	0.0179	0.0060	0.0000	0.0000	0.0476
SE	0.0238	0.0238	0.0000	0.0000	0.0060	0.0000	0.0595
SSE	0.0000	0.0179	0.0000	0.0060	0.0000	0.0000	0.0238
S	0.0000	0.0238	0.0119	0.0060	0.0000	0.0000	0.0417
SSW	0.0238	0.0000	0.0060	0.0000	0.0000	0.0000	0.0298
SW	0.0060	0.0238	0.0000	0.0000	0.0000	0.0000	0.0298
WSW	0.0060	0.0238	0.0060	0.0000	0.0000	0.0000	0.0357
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	0.5714						



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



NOTE : Frequencies indicate direction from which the wind is blowing

File Control : R:\Database\Windrose\FileControl\Win-221030-Technology IRPC School 21-28 Mar 2022

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team



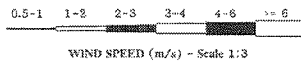
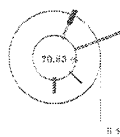
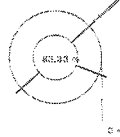
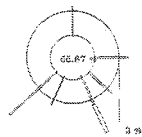
## Meteorological Monitoring Results : Wind Rose MTR-CPL

Location : Technology IRPC School  
Wind Speed Model : NRG Symphonie  
Wind Direction Model : NRG Symphonie

Monitor period : 21-28 Mar 2022  
Serial No : A5088  
Serial No : A5088

Time	21-22 Mar 2022		22-23 Mar 2022		23-24 Mar 2022		24-25 Mar 2022	
	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD
10:00 - 11:00	0.8	N	0.0	SSE	0.0	SSE	1.3	ENE
11:00 - 12:00	0.2	S	0.9	SW	0.0	WSW	4.2	NNE
12:00 - 13:00	1.2	SW	0.4	SW	0.0	SSE	0.2	SE
13:00 - 14:00	0.0	NNE	0.9	ESE	0.0	E	2.0	S
14:00 - 15:00	3.2	SSE	0.2	NE	0.0	E	1.6	NNE
15:00 - 16:00	1.7	SSE	0.3	ENE	0.0	WSW	1.5	ENE
16:00 - 17:00	1.5	SE	1.2	NE	0.0	SSW	0.0	SE
17:00 - 18:00	0.0	SE	0.0	WSW	0.0	SSE	0.4	NE
18:00 - 19:00	0.6	SSW	0.0	NNE	0.4	SE	0.0	SE
19:00 - 20:00	0.0	SE	0.0	NNE	0.3	S	0.0	ESE
20:00 - 21:00	0.0	WSW	0.0	NNE	0.0	SW	0.0	SSE
21:00 - 22:00	0.0	NNE	0.0	ESE	0.0	NE	0.0	S
22:00 - 23:00	0.3	ESE	0.0	E	0.0	SSE	0.0	NE
23:00 - 24:00	0.0	SW	0.0	S	0.0	SW	0.0	NE
00:00 - 01:00	0.0	NE	0.0	SW	0.0	S	0.0	SW
01:00 - 02:00	0.0	ESE	0.0	ESE	0.0	SE	0.0	SE
02:00 - 03:00	0.2	SW	0.0	S	0.0	S	0.0	ESE
03:00 - 04:00	0.0	SW	0.3	ESE	0.0	ESE	0.0	NNE
04:00 - 05:00	0.0	SW	0.0	SE	0.0	NE	0.0	NNE
05:00 - 06:00	0.0	SW	0.0	NE	0.0	E	0.0	NE
06:00 - 07:00	0.0	SSE	0.3	ESE	0.1	SSE	0.0	E
07:00 - 08:00	0.0	E	0.6	NE	0.2	E	0.0	E
08:00 - 09:00	1.3	E	0.0	NE	1.4	SE	1.1	ENE
09:00 - 10:00	1.4	SW	0.0	SSE	0.0	SW	0.6	SE

Wind Rose



File: C:\msd\Winbase\Win-Center\Win-221030-Technology IRPC School 21-28 Mar 2022

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

Preeda S.  
(Miss Preeda Sonjai)  
Technical Management Team



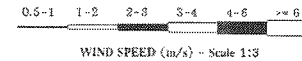
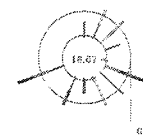
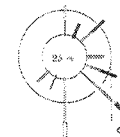
## Meteorological Monitoring Results : Wind Rose MTR-CPL

Location : Technology IRPC School  
Wind Speed Model : NRG Symphonie  
Wind Direction Model : NRG Symphonie

Monitor period : 21-28 Mar 2022  
Serial No : A5088  
Serial No : A5088

Time	25-26 Mar 2022		26-27 Mar 2022		27-28 Mar 2022	
	WS(m/s)	WD	WS(m/s)	WD	WS(m/s)	WD
10:00 - 11:00	0.5	N	1.6	WSW	3.6	NE
11:00 - 12:00	2.3	NNE	0.9	ENE	1.4	SW
12:00 - 13:00	4.3	SE	0.8	N	3.1	NE
13:00 - 14:00	2.6	NE	0.1	SE	1.3	WSW
14:00 - 15:00	1.7	E	0.5	SE	1.6	WSW
15:00 - 16:00	2.4	ESE	1.6	NE	1.9	N
16:00 - 17:00	1.6	N	1.2	SSE	0.2	NNE
17:00 - 18:00	0.3	ESE	0.8	SSW	1.5	ENE
18:00 - 19:00	1.1	ESE	2.3	ESE	1.4	ESE
19:00 - 20:00	0.8	SE	0.9	SE	0.3	SSE
20:00 - 21:00	1.6	SE	0.0	N	0.3	NNE
21:00 - 22:00	1.0	S	0.9	NNE	0.2	E
22:00 - 23:00	1.9	NE	0.9	WSW	0.0	ESE
23:00 - 24:00	1.6	S	1.3	NNE	0.5	NNE
00:00 - 01:00	1.5	S	2.1	S	1.5	S
01:00 - 02:00	1.6	SE	0.2	ENE	1.6	SE
02:00 - 03:00	0.0	NNE	2.5	WSW	0.6	SSW
03:00 - 04:00	0.0	S	2.0	SSW	0.0	ENE
04:00 - 05:00	0.5	SSW	2.3	ESE	0.0	SE
05:00 - 06:00	0.0	NNE	0.4	SW	0.2	N
06:00 - 07:00	0.0	ENE	1.1	NE	0.3	N
07:00 - 08:00	0.0	E	1.4	ESE	1.4	NE
08:00 - 09:00	3.0	S	1.3	SSE	1.1	WSW
09:00 - 10:00	1.5	SW	3.3	ESE	0.1	SE

Wind Rose



File: C:\msd\Winbase\Win-Center\Win-221030-Technology IRPC School 21-28 Mar 2022

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

Preeda S.  
(Miss Preeda Sonjai)  
Technical Management Team

## ภาคผนวก ง.2

ใบรับรองผลการตรวจวัดคุณภาพอากาศจากปล่องระบายอากาศ



**บริษัท ซีคอต จำกัด**  
**SECOT CO., LTD.**

239 ถนนวิมลทองประไพ แขวงบางซื่อ เขตบางซื่อ กรุงเทพฯ 10800

239 RIMKLONGPRAPA ROAD, BANGSUE, BANGKOK 10800, THAILAND

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

**STACK EMISSION ANALYSIS REPORT**

CLIENT NAME : UBE Chemical (Asia) Public Co., Ltd. REFERENCE NO. : 221030/Stk(Cert.)Mar/RTO  
SAMPLING BY : SECOT Co., Ltd. SAMPLING DATE : 22/03/2022  
RECEIVED DATE : 25/03/2022 ANALYTICAL DATE : 25/03/2022  
REPORT DATE : 11/04/2022 SAMPLE CONDITION : Normal  
STACK LOCATION : Outlet of RTO Stack SITE OPERATOR : Mr. Kittipong Thakoengsuk  
SOURCE DESCRIPTION : Combustion FUEL TYPE : LPG

**STACK DESCRIPTION**

Height : 35.0 m Gas Velocity : 8.9 m/s  
Diameter : 1.95 m Flow Rate\* : 983 Nm<sup>3</sup>/min  
Temperature : 158.8 °C Excess Oxygen : 13.1 %

PARAMETER	UNIT	RESULT*		STANDARD <sup>1/</sup>	REFERENCE METHOD
		13.1% O <sub>2</sub>	7% O <sub>2</sub>		
Oxide of Nitrogen (NO <sub>x</sub> )	ppm	4.2	7.4	200	U.S. EPA Method 7

*Phatchara Samanchan*

(Miss Phatchara Samanchan)

Analyst

REG.NO. 3-239-ก-8183

*Narisa Poowasanpetch*

(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO. 3-239-ก-6419

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

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

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

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

B.E.2549 @ 7% O<sub>2</sub>.



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**STACK EMISSION ANALYSIS REPORT**

CLIENT NAME : UBE Chemical (Asia) Public Co., Ltd. REFERENCE NO. : 221030/Stk(Cert.)Mar/RTO  
SAMPLING BY : SECOT Co., Ltd. SAMPLING DATE : 22/03/2022  
RECEIVED DATE : 23/03/2022 ANALYTICAL DATE : 23/03/2022  
REPORT DATE : 11/04/2022 SAMPLE CONDITION : Normal  
STACK LOCATION : Outlet of RTO Stack SITE OPERATOR : Mr. Kittipong Thakoengsuk  
SOURCE DESCRIPTION : Combustion FUEL TYPE : LPG

**STACK DESCRIPTION**

Height : 35.0 m Gas Velocity : 8.9 m/s  
Diameter : 1.95 m Flow Rate\* : 983 Nm<sup>3</sup>/min  
Temperature : 158.8 °C Excess Oxygen : 13.1 %

PARAMETER	UNIT	RESULT*		STANDARD <sup>1/</sup>	REFERENCE METHOD
		13.1% O <sub>2</sub>	7% O <sub>2</sub>		
Carbon Monoxide (CO)	ppm	4.4	7.9	690	U.S. EPA Method 10

*Sudaporn Soonthorn*

(Miss Sudaporn Soonthorn)

Analyst

REG.NO. 3-239-ก-0001

*Narisa Poowasanpetch*

(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO. 3-239-ก-6419

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

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

B.E.2549 @ 7% O<sub>2</sub>.



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#### STACK EMISSION ANALYSIS REPORT

CLIENT NAME : UBE Chemical (Asia) Public Co., Ltd. REFERENCE NO. : 221030/Stk(Cert.)/Mar/HTS Furnace  
 SAMPLING BY : SECOT Co., Ltd. SAMPLING DATE : 24/03/2022  
 RECEIVED DATE : 25/03/2022 ANALYTICAL DATE : 29/03/2022  
 REPORT DATE : 11/04/2022 SAMPLE CONDITION : Normal  
 STACK LOCATION : HTS Furnace Off Gas SITE OPERATOR : Mr. Kittipong Thakoengsuk  
 SOURCE DESCRIPTION : Combustion FUEL TYPE : LPG+H<sub>2</sub>

#### STACK DESCRIPTION

Height : 30.0 m Gas Velocity : 3.7 m/s  
 Diameter : 1.24 m Flow Rate\* : 107 Ncu.m/min  
 Temperature : 376.6 °C Excess Oxygen : 3.2 %

PARAMETER	UNIT	RESULT*		STANDARD <sup>1/</sup>	REFERENCE METHOD
		3.2% O <sub>2</sub>	7% O <sub>2</sub>		
Oxides of Nitrogen (NO <sub>x</sub> )	ppm	12.1	9.5	200	U.S. EPA Method 7

Phatchara Samanchan

(Miss Phatchara Samanchan)

Analyst

REG.NO.7-239-9-8183

Naris Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO.7-239-9-6419

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  3. \* At standard pressure of 760 mmHg and temperature of 25 °C, dry basis.
  4. <sup>1/</sup> Notification of the Ministry of Industry, B.E.2549 and the Ministry of Natural Resources and Environment, B.E.2549 @ 7% O<sub>2</sub>.



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#### STACK EMISSION ANALYSIS REPORT

CLIENT NAME : UBE Chemical (Asia) Public Co., Ltd. REFERENCE NO. : 221030/Stk(Cert.)/Mar/WGT  
 SAMPLING BY : SECOT Co., Ltd. SAMPLING DATE : 24/03/2022  
 RECEIVED DATE : 25/03/2022 ANALYTICAL DATE : 29/03/2022  
 REPORT DATE : 11/04/2022 SAMPLE CONDITION : Normal  
 STACK LOCATION : Waste Gas Treatment Off Gas SITE OPERATOR : Mr. Kittipong Thakoengsuk  
 SOURCE DESCRIPTION : Combustion FUEL TYPE : LPG+H<sub>2</sub>

#### STACK DESCRIPTION

Height : 37.0 m Gas Velocity : 39.3 m/s  
 Diameter : 0.9 m Flow Rate\* : 894 Ncu.m/min  
 Temperature : 176.4 °C Excess Oxygen : 5.0 %

PARAMETER	UNIT	RESULT*		STANDARD <sup>1/</sup>	REFERENCE METHOD
		5.0% O <sub>2</sub>	7% O <sub>2</sub>		
Oxides of Nitrogen (NO <sub>x</sub> )	ppm	36.7	32.2	200	U.S. EPA Method 7

Phatchara Samanchan

(Miss Phatchara Samanchan)

Analyst

REG.NO.7-239-9-8183

Naris Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO.7-239-9-6419

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  4. <sup>1/</sup> Notification of the Ministry of Industry, B.E.2549 and the Ministry of Natural Resources and Environment, B.E.2549 @ 7% O<sub>2</sub>.



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#### STACK EMISSION ANALYSIS REPORT

CLIENT NAME : UBE Chemical (Asia) Public Co., Ltd. REFERENCE NO. : 221030/Stk(Cert.)/Mar/WGT  
SAMPLING BY : SECOT Co., Ltd. SAMPLING DATE : 24/03/2022  
RECEIVED DATE : 25/03/2022 ANALYTICAL DATE : 30/03/2022  
REPORT DATE : 11/04/2022 SAMPLE CONDITION : Normal  
STACK LOCATION : Waste Gas Treatment Off Gas SITE OPERATOR : Mr. Kittipong Thakoengsuk  
SOURCE DESCRIPTION : Combustion FUEL TYPE : LPG+H<sub>2</sub>

#### STACK DESCRIPTION

Height : 37.0 m Gas Velocity : 39.3 m/s  
Diameter : 0.9 m Flow Rate\* : 894 Ncu.m/min  
Temperature : 176.4 °C Excess Oxygen : 5.0 %

PARAMETER	UNIT	RESULT*		STANDARD	REFERENCE METHOD
		5.0% O <sub>2</sub>	7% O <sub>2</sub>		
Ammonia (NH <sub>3</sub> )	ppm	2.5	2.2	-	U.S. EPA Method CTM-027

Phatchara Samanchan

(Miss Phatchara Samanchan)

Analyst

Narisa Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

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4. - means standard is not specified yet.



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#### STACK EMISSION ANALYSIS REPORT

CLIENT NAME : UBE Chemical (Asia) Public Co., Ltd. REFERENCE NO. : 221030/Stk(Cert.)/Mar/Column Ds  
SAMPLING BY : SECOT Co., Ltd. SAMPLING DATE : 24/03/2022  
RECEIVED DATE : 25/03/2022 ANALYTICAL DATE : 29/03/2022  
REPORT DATE : 11/04/2022 SAMPLE CONDITION : Normal  
STACK LOCATION : Column Ds Off Gas SITE OPERATOR : Mr. Kittipong Thakoengsuk  
SOURCE DESCRIPTION : Process

#### STACK DESCRIPTION

Height : 25.0 m Gas Velocity : 17.2 m/s  
Diameter : 0.5 m Flow Rate\* : 114 Ncu.m/min  
Temperature : 197.8 °C Excess Oxygen : 6.0 %

PARAMETER	UNIT	RESULT*	STANDARD <sup>U</sup>	REFERENCE METHOD
Sulfur Dioxide (SO <sub>2</sub> )	ppm	ND	500	U.S. EPA Method 6

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Narisa Poowasanpetch

(Miss Narisa Poowasanpetch)

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REG.NO. 2-239-0-6419

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

4. <sup>U</sup> Notification of the Ministry of Industry, B.E.2549 and the Ministry of Natural Resources and Environment, B.E.2549 @ Actual O<sub>2</sub>.

5. ND (Non-detectable) means the concentration is less than 1.9 ppm @ Actual O<sub>2</sub>.





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#### STACK EMISSION ANALYSIS REPORT

CLIENT NAME : UBE Chemical (Asia) Public Co., Ltd. REFERENCE NO. : 221030/Stk(Cert.)/Mar/Column Si  
SAMPLING BY : SECOT Co., Ltd. SAMPLING DATE : 23/03/2022  
RECEIVED DATE : 25/03/2022 ANALYTICAL DATE : 29-30/03/2022  
REPORT DATE : 11/04/2022 SAMPLE CONDITION : Normal  
STACK LOCATION : Column Si Off Gas SITE OPERATOR : Mr. Kittipong Thakoengsuk  
SOURCE DESCRIPTION : Process

#### STACK DESCRIPTION

Height : 23.0 m Gas Velocity : 44.0 m/s  
Diameter : 0.5 m Flow Rate\* : 437 Ncu.m/min  
Temperature : 47.0 °C Excess Oxygen : 8.2 %

PARAMETER	UNIT	RESULT*	STANDARD <sup>1/</sup>	REFERENCE METHOD
Particulate Matter (PM)	mg/Ncu.m.	6.1	400	U.S. EPA Method 5
Sulfur Dioxide (SO <sub>2</sub> )	ppm	ND	500	U.S. EPA Method 6

Phatchara Samanchan

(Miss Phatchara Samanchan)

Analyst

REG.NO. 7-239-0-8183

Narisa Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO. 7-239-0-6419

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

B.E.2549 @ Actual O<sub>2</sub>.

5. ND (Non-detectable) means the concentration is less than 1.9 ppm @ Actual O<sub>2</sub>.



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#### STACK EMISSION ANALYSIS REPORT

CLIENT NAME : UBE Chemical (Asia) Public Co., Ltd. REFERENCE NO. : 221030/Stk(Cert.)/Mar/Outlet of 2<sup>nd</sup> Absorption  
SAMPLING BY : SECOT Co., Ltd. SAMPLING DATE : 25/03/2022  
RECEIVED DATE : 28/03/2022 ANALYTICAL DATE : 29/03/2022  
REPORT DATE : 11/04/2022 SAMPLE CONDITION : Normal  
STACK LOCATION : Outlet of 2<sup>nd</sup> Absorption Tower Off Gas SITE OPERATOR : Mr. Kittipong Thakoengsuk  
SOURCE DESCRIPTION : Process

#### STACK DESCRIPTION

Height : 35.0 m Gas Velocity : 10.9 m/s  
Diameter : 0.9 m Flow Rate\* : 384 Ncu.m/min  
Temperature : 37.8 °C Excess Oxygen : 2.8 %

PARAMETER	UNIT	RESULT*	STANDARD	REFERENCE METHOD
Sulfur Trioxide (SO <sub>3</sub> )	ppm	ND	-	U.S. EPA Method 8

Phatchara Samanchan

(Miss Phatchara Samanchan)

Analyst

REG.NO. 7-239-0-8183

Narisa Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO. 7-239-0-6419

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4. - means standard is not specified yet.

5. ND (Non-detectable) means the concentration is less than 0.015 ppm @ Actual O<sub>2</sub>.



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#### STACK EMISSION ANALYSIS REPORT

CLIENT NAME : UBE Chemical (Asia) Public Co., Ltd. REFERENCE NO. : 221030/Stk(Cert.)/Mar/Combined  
SAMPLING BY : SECOT Co., Ltd. SAMPLING DATE : 22/03/2022  
RECEIVED DATE : 23/03/2022 ANALYTICAL DATE : 25, 29-30/03/2022  
REPORT DATE : 11/04/2022 SAMPLE CONDITION : Normal  
STACK LOCATION : Combined Stack (Incinerator Unit 4400) SITE OPERATOR : Mr. Kittipong Thakoengsuk  
SOURCE DESCRIPTION : Combustion FUEL TYPE : Mixed Anone

#### STACK DESCRIPTION

Height : 90.0 m Gas Velocity : 8.9 m/s  
Diameter : 0.37 m Flow Rate\* : 46.0 Ncu.m/min  
Temperature : 59.0 °C Excess Oxygen : 16.5 %

PARAMETER	UNIT	RESULT*		STANDARD <sup>1/</sup>	REFERENCE METHOD
		16.5% O <sub>2</sub>	7% O <sub>2</sub>		
Particulate Matter (PM)	mg/Ncu.m.	4.4	14.0	320	U.S. EPA Method 5
Sulfur Dioxide (SO <sub>2</sub> )	ppm	ND	ND	60	U.S. EPA Method 6
Oxides of Nitrogen (NO <sub>x</sub> )	ppm	11.0	34.7	200	U.S. EPA Method 7

Phatchara Samanchan  
(Miss Phatchara Samanchan)

Analyst

REG.NO. J-239-B-8183

Narisa Poowasanpetch  
(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO. J-239-B-6419

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

4. <sup>1/</sup> Notification of the Ministry of Industry, B.E.2549 and the Ministry of Natural Resources and Environment, B.E.2549 @ 7% O<sub>2</sub>.

5. ND (Non-detectable) means the concentration is less than 1.9 ppm @ Actual O<sub>2</sub>.



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#### STACK EMISSION ANALYSIS REPORT

CLIENT NAME : UBE Chemical (Asia) Public Co., Ltd. REFERENCE NO. : 221030/Stk(Cert.)/Mar/Combined  
SAMPLING BY : SECOT Co., Ltd. SAMPLING DATE : 22/03/2022  
RECEIVED DATE : 23/03/2022 ANALYTICAL DATE : 23/03/2022  
REPORT DATE : 11/04/2022 SAMPLE CONDITION : Normal  
STACK LOCATION : Combined Stack (Incinerator Unit 4400) SITE OPERATOR : Mr. Kittipong Thakoengsuk  
SOURCE DESCRIPTION : Combustion FUEL TYPE : Mixed Anone

#### STACK DESCRIPTION

Height : 90.0 m Gas Velocity : 8.9 m/s  
Diameter : 0.37 m Flow Rate\* : 46.0 Ncu.m/min  
Temperature : 59.0 °C Excess Oxygen : 16.5 %

PARAMETER	UNIT	RESULT*		STANDARD <sup>1/</sup>	REFERENCE METHOD
		16.5% O <sub>2</sub>	7% O <sub>2</sub>		
Carbon Monoxide (CO)	ppm	1.2	3.8	690	U.S. EPA Method 10

Sudaporn Soonthorn  
(Miss Sudaporn Soonthorn)

Analyst

REG.NO. J-239-B-0001

Narisa Poowasanpetch  
(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO. J-239-B-6419

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

4. <sup>1/</sup> Notification of the Ministry of Industry, B.E.2549 and the Ministry of Natural Resources and Environment, B.E.2549 @ 7% O<sub>2</sub>.



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# STACK EMISSION ANALYSIS REPORT

CLIENT NAME : UBE Chemicals (Asia) Public Co., Ltd. REFERENCE NO. : 221030/Slk(Cert.)\Outlet(Mar)  
SAMPLING BY : SECOT Co., Ltd. SAMPLING DATE : 25/03/2022  
RECEIVED DATE : 25/03/2022 ANALYTICAL DATE : 25.29-30/03/2022  
REPORT DATE : 06/04/2021 SAMPLE CONDITION : Normal  
STACK LOCATION : AR Boiler (Outlet) SITE OPERATOR : Mr. Kittipong Thakoengsuk  
SOURCE DESCRIPTION : Combustion FUEL TYPE : Mixed Anone/Diesel Oil  
STACK DESCRIPTION

Height : 30.0 m Gas Velocity : 13.8 m/s  
Diameter : 1.33 m Flow Rate\* : 720 Ncu.m/min  
Temperature : 154.7 °C Oxygen Content : 8.8 %

PARAMETER	UNIT	RESULT*			REFERENCE
		8.8% O <sub>2</sub>	7% O <sub>2</sub>	7% O <sub>2</sub>	
Particulate Matter (PM)	mg/Ncu.m.	19.6	22.5	320	U.S. EPA Method 5
Sulfur Dioxide (SO <sub>2</sub> )	ppm	ND	ND	60	U.S. EPA Method 6
Oxide of Nitrogen (NO <sub>x</sub> )	ppm	10.0	11.5	200	U.S. EPA Method 7

Phatchara Samanchan

(Miss Phatchara Samanchan)

Analyst

REG.NO. 7-239-8-8183

Naris Poowasanpeth

(Miss Narisa Poowasanpeth)

Technical Management Team

REG.NO. 7-239-8-6419

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

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

4. <sup>1</sup> Notification of the Ministry of Industry, B.E.2549 and Notification of the Ministry of Natural Resources and Environment, B.E.2549 @ 7%O<sub>2</sub>.

5. ND (Non-detectable) means the concentration is less than 1.9 ppm @ Actual O<sub>2</sub>.



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# STACK EMISSION ANALYSIS REPORT

CLIENT NAME : UBE Chemicals (Asia) Public Co., Ltd. REFERENCE NO. : 221030/Slk(Cert.)\Outlet(Mar)  
SAMPLING BY : SECOT Co., Ltd. SAMPLING DATE : 25/03/2022  
RECEIVED DATE : 28/03/2022 ANALYTICAL DATE : 28/03/2022  
REPORT DATE : 06/04/2022 SAMPLE CONDITION : Normal  
STACK LOCATION : AR Boiler (Outlet) OPERATOR : Mr. Kittipong Thakoengsuk  
SOURCE DESCRIPTION : Combustion FUEL TYPE : Mixed Anone/Diesel Oil  
STACK DESCRIPTION

Height : 30.0 m Gas Velocity : 13.8 m/s  
Diameter : 1.33 m Flow Rate\* : 720 Ncu.m/min  
Temperature : 154.7 °C Oxygen Content : 8.8 %

PARAMETER	UNIT	RESULT*			REFERENCE
		8.8% O <sub>2</sub>	7% O <sub>2</sub>	7% O <sub>2</sub>	
Carbon Monoxide (CO)	ppm	1.5	1.7	690	U.S. EPA Method 10

Sudaporn Soonthorn

(Miss Sudaporn Soonthorn)

Analyst

REG.NO. 7-239-8-0001

Naris Poowasanpeth

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Technical Management Team

REG.NO. 7-239-8-6419

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

4. <sup>1</sup> Notification of the Ministry of Industry, B.E.2549 and the Ministry of Natural Resources and Environment, B.E.2549 @ 7%O<sub>2</sub>.



บริษัท ซีคอต จำกัด  
SECOT CO., LTD.

239 ถนนมิตรภาพประชาภิรมย์ 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 : UBE Chemical (Asia) Public Co., Ltd. REFERENCE NO. : 221030/Std(Cert.)Mar/Dryer (1410-V17)  
SAMPLING BY : SECOT Co., Ltd. SAMPLING DATE : 23/03/2022  
RECEIVED DATE : 25/03/2022 ANALYTICAL DATE : 29-30/03/2022  
REPORT DATE : 31/03/2022 SAMPLE CONDITION : Normal  
STACK LOCATION : Dryer Off Gas (1410-V17) SITE OPERATOR : Mr. Kittipong Thakoengsuk  
SOURCE DESCRIPTION : Process

#### STACK DESCRIPTION

Height : 23.0 m Gas Velocity : 17.5 m/s  
Diameter : 0.9 m Flow Rate\* : 567 Ncu.m/min  
Temperature : 56.6 °C Excess Oxygen : 20.9 %

PARAMETER	UNIT	RESULT*	STANDARD <sup>1/</sup>	REFERENCE METHOD
Particulate Matter (PM)	mg/Ncu.m.	2.1	400	U.S. EPA Method 5

Phatchara Samanchan  
(Miss Phatchara Samanchan)

Analyst

REG.NO. 3-239-0-8183

Narisa Poowasanpetch  
(Miss Narisa Poowasanpetch)

Technical Management Team

REG.NO. 3-239-0-6419

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

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

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

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

B.E.2549 @ Actual O<sub>2</sub>.

### ภาคผนวก ง.3

#### ใบรับรองผลการตรวจวัดระดับเสียง

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## ใบรับรองผลการตรวจวัดระดับเสียงในชุมชน



## Noise Monitoring Result : Community Noise

### MTR-CPL

Location : Moo 4 of Ta Phong Sub District(North of Project Site) Monitor Period : 21-28 Mar 2022  
SLM Model : RION NL-21 Serial No : 00187515  
Site Operator : Mr.Supakit Tamooka

Calibrator Model : RION NC-74 Serial No : 34283648  
Calibration Ref dB(A) : 94.0 Certified Date : 24 Dec 2021  
SLM Reading / Adjust dB(A) : 93.9/0.1 Expire Date : 23 Dec 2022  
Cal Sheet No.: NC-74-2022-027

Time	Equivalent Sound Pressure Level (dB(A))						
	21-22 Mar 2022	22-23 Mar 2022	23-24 Mar 2022	24-25 Mar 2022	25-26 Mar 2022	26-27 Mar 2022	27-28 Mar 2022
10:00 - 11:00	59.2	58.3	58.2	56.6	60.4	60.4	56.8
11:00 - 12:00	61.0	61.0	57.6	58.1	58.5	60.0	57.2
12:00 - 13:00	56.3	57.0	59.3	57.6	58.4	58.8	57.8
13:00 - 14:00	60.4	63.9	59.7	60.0	56.8	58.4	57.6
14:00 - 15:00	58.1	57.0	57.0	59.3	60.5	59.8	57.6
15:00 - 16:00	61.1	63.6	58.3	63.9	57.0	60.6	56.8
16:00 - 17:00	62.9	56.6	62.8	52.3	59.7	54.8	56.4
17:00 - 18:00	58.1	53.1	53.1	52.0	56.6	52.1	52.8
18:00 - 19:00	49.9	49.7	55.8	49.2	52.6	49.0	49.6
19:00 - 20:00	49.8	55.0	52.8	48.9	53.8	49.2	49.7
20:00 - 21:00	49.6	62.8	54.3	48.6	49.6	49.9	50.1
21:00 - 22:00	49.0	62.6	53.6	50.9	50.4	49.6	49.5
22:00 - 23:00	49.9	51.7	51.6	51.3	48.9	50.4	49.0
23:00 - 00:00	48.5	62.0	53.7	50.9	54.4	48.9	48.9
00:00 - 01:00	62.1	56.5	60.1	50.5	49.7	49.2	49.0
01:00 - 02:00	51.9	56.4	63.6	49.0	58.1	49.7	51.7
02:00 - 03:00	52.4	54.4	65.6	49.2	56.4	53.1	48.4
03:00 - 04:00	53.5	37.8	61.8	49.5	61.8	55.4	55.2
04:00 - 05:00	60.5	61.1	62.1	49.6	58.7	61.8	60.5
05:00 - 06:00	61.4	63.8	60.3	50.4	57.1	58.7	58.8
06:00 - 07:00	57.3	59.0	58.3	48.9	63.8	57.1	57.6
07:00 - 08:00	58.1	59.6	57.0	58.8	56.1	55.5	56.1
08:00 - 09:00	61.5	62.5	55.7	57.6	61.3	58.1	56.4
09:00 - 10:00	61.3	59.3	57.3	60.4	57.0	56.7	60.4
Leq(24)*	58.3	59.0	59.4	56.2	58.1	56.9	55.9
Ldn	63.2	65.1	67.4	58.8	64.8	62.8	62.1
Lmax **	88.7	89.9	86.2	89.8	85.4	78.0	89.1
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-CPL

Location : Moo 4 of Ta Phong Sub District(North of Project Site) Monitor Period : 21-28 Mar 2022  
SLM Model : RION NL-21 Serial No : 00187515  
Site Operator : Mr.Supakit Tamooka

Calibrator Model : RION NC-74 Serial No : 34283648  
Calibration Ref dB(A) : 94.0 Certified Date : 24 Dec 2021  
SLM Reading / Adjust dB(A) : 93.9/0.1 Expire Date : 23 Dec 2022  
Cal Sheet No.: NC-74-2022-027

Time	L90 (dB(A))						
	21-22 Mar 2022	22-23 Mar 2022	23-24 Mar 2022	24-25 Mar 2022	25-26 Mar 2022	26-27 Mar 2022	27-28 Mar 2022
10:00 - 11:00	50.5	50.6	49.6	50.2	50.9	50.9	50.8
11:00 - 12:00	49.9	49.5	49.0	48.9	51.6	50.3	49.8
12:00 - 13:00	50.7	51.2	50.0	49.6	52.2	51.6	51.0
13:00 - 14:00	50.9	51.4	50.6	50.6	51.7	52.2	50.9
14:00 - 15:00	49.5	50.6	49.8	50.7	52.1	53.1	51.2
15:00 - 16:00	49.6	50.6	50.8	50.6	50.6	52.1	51.7
16:00 - 17:00	50.2	49.5	49.8	48.2	50.6	49.3	51.1
17:00 - 18:00	49.4	48.7	50.3	49.2	49.5	48.6	49.6
18:00 - 19:00	48.1	47.8	49.5	48.0	48.5	48.3	48.6
19:00 - 20:00	48.6	48.2	49.4	48.0	49.4	48.2	48.7
20:00 - 21:00	47.8	48.5	47.8	46.6	48.7	48.5	49.3
21:00 - 22:00	46.9	47.5	46.8	49.0	48.0	48.7	48.6
22:00 - 23:00	46.3	46.7	46.7	49.9	48.1	48.0	48.1
23:00 - 00:00	45.6	45.9	47.1	47.3	45.1	48.1	47.6
00:00 - 01:00	47.9	48.6	48.6	48.2	48.7	48.4	48.4
01:00 - 02:00	49.5	49.5	51.2	48.3	48.9	48.7	48.1
02:00 - 03:00	49.6	45.1	49.6	48.2	48.7	48.9	47.6
03:00 - 04:00	49.5	45.7	49.8	48.6	51.3	48.7	47.8
04:00 - 05:00	50.0	47.8	51.6	48.7	50.1	51.3	47.5
05:00 - 06:00	50.4	50.3	52.9	48.0	50.1	50.1	50.8
06:00 - 07:00	49.8	55.8	49.8	48.1	50.5	50.1	48.8
07:00 - 08:00	50.8	58.9	49.8	50.8	50.8	50.4	47.6
08:00 - 09:00	51.8	55.7	50.2	48.8	51.6	50.8	47.7
09:00 - 10:00	51.6	56.2	50.7	50.8	49.6	50.8	47.2
L90(avg)*	49.6	51.0	49.9	49.1	50.2	50.1	49.3

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-CPL

Location : North fence of Project Site  
SLM Model : RION NL-21  
Site Operator : Mr.Supakit Tamooka

Monitor Period : 21-28 Mar 2022  
Serial No : 00487719

Calibrator Model : RION NC-74  
Calibration Ref dB(A) : 94.0  
SLM Reading / Adjust dB(A) : 93.8/0.2  
Cal Sheet No.: NC-74-2022-027

Serial No : 34283648  
Certified Date : 24 Dec 2021  
Expire Date : 23 Dec 2022

Time	Equivalent Sound Pressure Level (dB(A))						
	21-22 Mar 2022	22-23 Mar 2022	23-24 Mar 2022	24-25 Mar 2022	25-26 Mar 2022	26-27 Mar 2022	27-28 Mar 2022
12:00 - 13:00	59.3	58.2	58.7	56.2	55.7	55.3	55.2
13:00 - 14:00	59.3	57.0	56.7	56.6	56.9	55.7	55.4
14:00 - 15:00	56.4	56.6	56.8	56.8	56.3	55.8	55.6
15:00 - 16:00	56.6	56.0	57.0	56.8	56.6	55.5	55.8
16:00 - 17:00	60.1	55.8	56.7	57.3	55.5	55.2	55.4
17:00 - 18:00	59.7	59.5	59.0	58.7	59.2	57.9	58.8
18:00 - 19:00	56.0	55.7	56.4	54.8	54.2	54.5	54.9
19:00 - 20:00	56.0	56.0	56.3	54.8	54.3	54.3	55.0
20:00 - 21:00	55.7	55.6	55.5	55.1	54.6	55.0	55.2
21:00 - 22:00	55.8	55.5	55.2	55.5	54.8	54.5	54.3
22:00 - 23:00	55.9	55.5	55.1	54.9	55.4	55.0	54.2
23:00 - 00:00	56.3	55.9	55.1	53.9	54.8	54.4	55.7
00:00 - 01:00	57.1	55.6	55.1	54.3	54.4	54.5	54.4
01:00 - 02:00	57.0	57.6	55.1	53.8	54.5	55.7	54.3
02:00 - 03:00	57.7	55.2	55.1	54.2	54.3	54.5	54.3
03:00 - 04:00	59.8	57.2	55.8	54.8	54.4	54.6	54.4
04:00 - 05:00	58.9	55.7	56.4	57.2	57.3	56.5	54.4
05:00 - 06:00	55.5	56.2	55.8	54.5	55.2	54.6	56.9
06:00 - 07:00	56.1	59.9	55.4	55.0	54.3	54.6	54.9
07:00 - 08:00	56.7	57.3	56.1	55.5	54.5	54.6	54.7
08:00 - 09:00	57.0	57.5	56.3	56.7	55.7	54.6	55.4
09:00 - 10:00	56.2	56.0	55.8	55.6	54.8	54.5	54.9
10:00 - 11:00	56.4	55.0	55.5	55.9	54.7	54.8	55.7
11:00 - 12:00	55.4	55.1	55.2	55.4	54.7	55.2	57.7
Leq(24)*	57.4	56.6	56.2	55.6	55.1	55.2	56.9
Ldn	63.9	63.2	62.3	61.5	61.6	61.6	61.9
Lmax **	75.8	75.3	74.3	74.7	72.9	68.9	91.9
Standard-24Hr	70 dB(A)						
Standard-Max	115 dB(A)						

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

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

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team



## Noise Monitoring Result : Background Noise

### MTR-CPL

Location : North fence of Project Site  
SLM Model : RION NL-21  
Site Operator : Mr.Supakit Tamooka

Monitor Period : 21-28 Mar 2022  
Serial No : 00487719

Calibrator Model : RION NC-74  
Calibration Ref dB(A) : 94.0  
SLM Reading / Adjust dB(A) : 93.8/0.2  
Cal Sheet No.: NC-74-2022-027

Serial No : 34283648  
Certified Date : 24 Dec 2021  
Expire Date : 23 Dec 2022

Time	L90 (dB(A))						
	21-22 Mar 2022	22-23 Mar 2022	23-24 Mar 2022	24-25 Mar 2022	25-26 Mar 2022	26-27 Mar 2022	27-28 Mar 2022
12:00 - 13:00	58.3	54.9	54.6	55.0	54.6	54.5	54.6
13:00 - 14:00	57.6	55.7	53.7	55.4	54.8	54.8	54.7
14:00 - 15:00	55.3	55.4	53.6	55.6	54.7	54.6	55.6
15:00 - 16:00	58.4	55.1	56.2	55.5	54.6	54.5	55.0
16:00 - 17:00	55.7	55.3	55.9	55.0	54.3	54.5	54.8
17:00 - 18:00	55.9	55.5	55.1	54.8	54.2	54.6	54.5
18:00 - 19:00	55.7	55.4	55.9	54.4	53.9	54.1	54.4
19:00 - 20:00	55.8	55.4	55.7	54.4	53.9	54.0	54.6
20:00 - 21:00	55.4	55.3	55.2	54.4	54.2	53.9	54.9
21:00 - 22:00	55.3	55.2	55.0	55.0	54.1	54.2	53.9
22:00 - 23:00	55.8	55.2	54.9	54.1	54.3	54.1	53.9
23:00 - 00:00	56.1	55.2	54.8	53.4	54.0	54.1	54.0
00:00 - 01:00	56.1	55.2	54.9	54.0	54.1	54.2	54.0
01:00 - 02:00	55.8	55.4	54.6	53.6	54.2	54.2	53.9
02:00 - 03:00	55.8	54.2	54.6	53.8	54.0	54.1	53.9
03:00 - 04:00	55.7	54.5	55.3	54.5	54.1	54.3	54.0
04:00 - 05:00	55.3	54.9	55.1	54.6	54.2	54.3	53.8
05:00 - 06:00	55.0	54.6	55.1	53.9	54.1	54.2	54.1
06:00 - 07:00	55.7	57.0	55.0	54.3	53.9	54.2	53.8
07:00 - 08:00	56.0	56.5	55.4	54.4	53.7	54.2	53.6
08:00 - 09:00	55.8	55.8	55.2	54.4	53.9	54.1	53.6
09:00 - 10:00	55.4	54.8	54.7	54.2	53.9	54.0	53.6
10:00 - 11:00	55.4	54.4	54.5	54.7	54.1	54.2	53.9
11:00 - 12:00	54.9	54.5	54.6	54.6	54.1	54.6	53.7
L90(avg)*	55.3	55.3	55.3	54.5	54.2	54.3	54.2

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

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team





## Noise Monitoring Result : Community Noise

### MTR-CPL

Location : Technology IRPC School	Monitor Period : 21-28 Mar 2022
SLM Model : Cirrus CR162B	Serial No : G300990
Site Operator : Mr.Supakit Tamooka	
Calibrator Model : Casella CEL-120/1	Serial No : 0254955
Calibration Ref dB(A) : 93.7	Certified Date : 24 Dec 2021
SLM Reading / Adjust dB(A) : 93.7/0.3	Expire Date : 23 Dec 2022
Cal Sheet No.: CEL-120-1-2022-004	

Time	Equivalent Sound Pressure Level (dB(A))						
	21-22 Mar 2022	22-23 Mar 2022	23-24 Mar 2022	24-25 Mar 2022	25-26 Mar 2022	26-27 Mar 2022	27-28 Mar 2022
09:00 - 10:00	62.4	62.8	55.0	54.8	57.7	48.5	51.2
10:00 - 11:00	58.0	62.3	50.2	51.7	50.2	60.0	51.7
11:00 - 12:00	55.5	49.1	49.5	49.3	54.0	50.6	51.3
12:00 - 13:00	55.0	62.4	45.4	51.8	52.3	48.9	51.1
13:00 - 14:00	51.4	54.6	46.5	49.1	49.9	51.5	50.5
14:00 - 15:00	52.1	54.3	50.8	48.9	51.3	52.8	51.8
15:00 - 16:00	49.6	54.3	48.4	50.6	49.8	51.1	50.6
16:00 - 17:00	49.3	54.3	49.0	48.7	50.5	49.4	50.2
17:00 - 18:00	56.9	54.3	49.2	52.1	50.3	49.2	52.0
18:00 - 19:00	55.6	52.6	50.8	50.8	51.0	51.2	52.3
19:00 - 20:00	47.1	49.6	47.7	48.1	48.0	48.3	48.1
20:00 - 21:00	47.7	49.4	46.9	48.0	48.3	47.8	47.7
21:00 - 22:00	47.6	49.4	48.1	48.9	48.5	46.5	47.8
22:00 - 23:00	47.9	49.3	45.8	47.6	47.5	46.6	47.5
23:00 - 00:00	49.6	49.4	45.3	47.3	46.9	47.1	47.6
00:00 - 01:00	48.6	49.4	50.4	48.2	46.5	45.9	48.2
01:00 - 02:00	48.5	49.4	45.3	54.1	46.1	47.1	48.9
02:00 - 03:00	46.6	49.3	50.2	51.5	45.9	47.8	48.6
03:00 - 04:00	46.9	49.4	51.1	48.7	46.1	47.0	48.2
04:00 - 05:00	48.1	50.9	51.5	48.3	46.9	47.5	48.5
05:00 - 06:00	54.5	54.3	51.6	51.4	50.8	54.0	52.7
06:00 - 07:00	50.4	54.3	51.7	50.3	49.5	50.0	51.0
07:00 - 08:00	48.8	54.3	51.0	50.7	47.9	49.2	50.3
08:00 - 09:00	53.5	54.3	57.2	58.9	46.9	51.1	55.7

Leq(24) *	53.6	52.4	50.7	51.4	50.4	49.7	50.4
Ldn	57.3	57.9	56.6	57.0	54.6	55.5	55.0
Lmax **	82.5	77.5	77.7	78.2	78.2	73.7	69.2

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

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

\*\* Maximum Sound Pressure Level between 09:00-09:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team



## Noise Monitoring Result : Background Noise

### MTR-CPL

Location : Technology IRPC School	Monitor Period : 21-28 Mar 2022
SLM Model : Cirrus CR162B	Serial No : G300990
Site Operator : Mr.Supakit Tamooka	
Calibrator Model : Casella CEL-120/1	Serial No : 0254955
Calibration Ref dB(A) : 93.7	Certified Date : 24 Dec 2021
SLM Reading / Adjust dB(A) : 93.7/0.3	Expire Date : 23 Dec 2022
Cal Sheet No.: CEL-120-1-2022-004	

Time	L90 (dB(A))						
	21-22 Mar 2022	22-23 Mar 2022	23-24 Mar 2022	24-25 Mar 2022	25-26 Mar 2022	26-27 Mar 2022	27-28 Mar 2022
09:00 - 10:00	49.0	47.6	50.7	46.9	47.1	45.1	48.1
10:00 - 11:00	48.7	46.8	46.8	47.6	47.2	46.9	47.3
11:00 - 12:00	52.5	45.7	43.0	48.6	51.6	46.2	47.5
12:00 - 13:00	47.5	45.1	41.8	48.7	47.8	46.3	45.9
13:00 - 14:00	48.0	48.3	40.9	47.1	47.1	46.9	46.4
14:00 - 15:00	47.8	50.9	44.6	48.7	47.4	47.3	47.5
15:00 - 16:00	48.4	50.9	44.7	46.8	46.9	46.9	47.1
16:00 - 17:00	45.8	50.9	46.5	46.1	46.9	46.8	47.2
17:00 - 18:00	46.4	50.9	44.9	46.3	46.7	46.5	47.0
18:00 - 19:00	46.3	50.0	46.7	45.9	47.2	46.9	47.2
19:00 - 20:00	46.2	45.9	46.4	45.9	46.9	45.8	46.2
20:00 - 21:00	46.7	45.8	45.8	44.9	46.8	45.1	45.9
21:00 - 22:00	46.6	45.8	46.6	45.4	47.0	44.8	46.0
22:00 - 23:00	46.8	45.8	43.5	46.5	45.8	45.1	45.6
23:00 - 00:00	47.6	45.8	43.7	46.1	44.9	45.2	45.6
00:00 - 01:00	45.7	45.8	45.4	45.8	44.7	44.5	45.3
01:00 - 02:00	46.4	45.8	47.0	47.3	44.8	44.7	46.0
02:00 - 03:00	45.1	45.7	48.8	47.3	44.6	44.5	46.0
03:00 - 04:00	44.6	45.7	49.4	47.4	44.3	44.3	46.0
04:00 - 05:00	43.9	46.0	49.3	46.6	44.9	44.9	45.9
05:00 - 06:00	45.4	50.9	48.5	47.9	46.1	45.9	47.5
06:00 - 07:00	46.7	50.9	48.9	48.4	46.5	46.9	46.1
07:00 - 08:00	46.4	50.9	47.1	48.0	45.8	46.4	47.4
08:00 - 09:00	48.2	50.9	47.4	49.3	44.6	46.3	47.8

L90(avg) *	47.3	48.5	46.8	46.9	46.7	45.9	46.7
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Remark : \* Average time between 09:00-09:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Preeda Somjai)  
Technical Management Team

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## ใบรับรองผลการตรวจวัดระดับเสียงที่ความถี่ต่างๆ



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

### SOUND PRESSURE LEVEL AT EACH FREQUENCY REPORT

CLIENT NAME	: UBE Chemicals (Asia) Public Co., Ltd.	REFERENCE NO.	: 221030 Octave (Cert.)/Jan22
MEASUREMENT BY	: SECOT Co., Ltd.	INSTRUMENT	: Sound Level Meter (Octave Band)
MEASUREMENT LOCATION	: CPL Plant	CALIBRATOR	: Sound Calibrator
MEASUREMENT DATE	: 05/01/2022	CALIBRATOR TYPE	: Class 1 S/N : 25495
SITE OPERATOR	: Mr. Natchapon Kadu	CALIBRATION REF.	: 114 dB@1 KHz

Location	Sound Pressure Level (dBA)	Sound Pressure Level at each Frequency (dBA)									
		31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1,000 Hz	2,000 Hz	4,000 Hz	8,000 Hz	16,000 Hz
Cyclohexanone (1110-K1)	84.6	34.5	48.8	56.5	66.1	76.7	75.6	78.9	80.0	73.5	58.3
SA & WLC (4140-1)	89.3	38.0	57.6	63.0	67.2	74.1	82.5	86.6	80.9	76.2	64.1
Hydroxylamine Unit (1210-PB1)	90.9	38.0	54.7	63.4	72.3	79.6	87.1	87.4	78.7	67.5	49.4
Refrigeration Unit (2510-K1)	85.0	34.1	50.7	57.7	67.7	77.2	78.1	80.5	78.6	68.7	52.0
Wastewater Treatment (4700-B1)	90.3	44.5	55.0	64.7	83.1	80.6	79.9	84.4	84.1	81.4	68.1

  
(Miss Katesarin Vorradetwittaya)

Environmental Scientist

  
(Miss Sununta Sirawuttinanon)

Technical Management Team

Remark : 1. Reported analysis refers to submitted sample only.  
2. This report shall not be reproduced, except in full, without official approval.



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SECOT CO., LTD.

239 ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพฯ 10800

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

### SOUND PRESSURE LEVEL AT EACH FREQUENCY REPORT

CLIENT NAME	: UBE Chemicals (Asia) Public Co., Ltd.	REFERENCE NO.	: 222030 Octave (Cert.)/May22
MEASUREMENT BY	: SECOT Co., Ltd.	INSTRUMENT	: Sound Level Meter (Octave Band)
MEASUREMENT LOCATION	: CPL Plant	CALIBRATOR	: Sound Calibrator
MEASUREMENT DATE	: 18/05/2022	CALIBRATOR TYPE	: Class 1 S/N : 0254955
SITE OPERATOR	: Mr. phakphum Thanthai	CALIBRATION REF.	: 114 dB@1 KHz

Location	Sound Pressure Level (dBA)	Sound Pressure Level at each Frequency (dBA)									
		31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1,000 Hz	2,000 Hz	4,000 Hz	8,000 Hz	16,000 Hz
Cyclohexanone (1110-K1)	84.8	34.5	48.9	58.7	67.9	75.2	77.7	80.2	78.7	73.0	59.7
SA & WLC (4140-1)	85.7	40.0	56.8	61.2	66.7	72.1	80.1	81.1	78.7	77.1	65.3
Hydroxylamine Unit (1210-PB1)	86.5	36.2	51.4	61.0	69.0	76.8	84.1	80.7	74.0	65.6	52.9
Refrigeration Unit (2510-K1)	83.7	33.0	50.6	57.5	78.7	77.2	76.3	77.5	70.5	60.2	44.5
Wastewater Treatment (4700-B1)	86.6	48.9	57.9	63.6	72.1	79.4	76.7	79.6	81.7	77.6	66.0

(Miss Katesarin Vorradetwittaya)

Environmental Scientist

(Miss Sununta Sirawuttinanon)

Technical Management Team

- Remark :**
1. Reported analysis refers to submitted sample only.
  2. This report shall not be reproduced, except in full, without official approval.

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## ใบรับรองผลการตรวจวัดระดับเสียงเฉลี่ยตลอดเวลาการทำงาน



## Noise Monitoring Result : Working Noise MTR-CPL

Location : Cyclohexanone (110-K1) Monitor Period : Jan 05, 2022  
SLM Model : CASELLA CEL-246 Serial No : 1443758  
Site Operator : Mr.Natchapon Kadu

Calibrator Model : CASELLA CEL120/2 Serial No : 2839225  
Calibration Ref dB(A) : 114.0 Certified Date : Dec 24, 2021  
SLM Reading / Adjust dB(A) : 113.7/0.3 Expire Date : Dec 23, 2022  
Cal Sheet No.: CEL120/2-2022-002

Time	Equivalent Sound Pressure Level (dB(A))	
	Jan 05, 2022	
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	83.7	
10:00 - 11:00	83.7	
11:00 - 12:00	83.6	
12:00 - 13:00	83.8	
13:00 - 14:00	83.7	
14:00 - 15:00	83.7	
15:00 - 16:00	83.6	
16:00 - 17:00	83.6	
17:00 - 18:00	83.7	
18:00 - 19:00	83.7	
19:00 - 20:00	84.0	
20:00 - 21:00	84.2	
21:00 - 22:00		
22:00 - 23:00		
23:00 - 24:00		
Leq(12)*	83.8	
Lmax **	88.7	
Standard-12Hr	87 dB(A)	
Standard-Max	140 dB(A)	

Remark : \* Average time between 09:00-21:00

\*\* Maximum Sound Pressure Level between 09:00-21:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Sununta Sirawuttinanon)  
Technical Management Team



## Noise Monitoring Result : Working Noise MTR-CPL

Location : Cyclohexanone 1110-K1 Monitor Period : May 18, 2022  
SLM Model : CASELLA CEL-246 Serial No : 3173161  
Site Operator : Mr. Phakphum Thanthai

Calibrator Model : CASELLA CEL120/2 Serial No : 2839225  
Calibration Ref dB(A) : 114.0 Certified Date : Dec 24, 2021  
SLM Reading / Adjust dB(A) : 113.0/1.0 Expire Date : Dec 23, 2022  
Cal Sheet No.: CEL120/2-2022-056

Time	Equivalent Sound Pressure Level (dB(A))	
	May 18, 2022	
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	83.8	
10:00 - 11:00	83.7	
11:00 - 12:00	83.8	
12:00 - 13:00	83.8	
13:00 - 14:00	83.6	
14:00 - 15:00	83.6	
15:00 - 16:00	84.1	
16:00 - 17:00	84.1	
17:00 - 18:00	84.1	
18:00 - 19:00	83.9	
19:00 - 20:00	84.0	
20:00 - 21:00	84.0	
21:00 - 22:00		
22:00 - 23:00		
23:00 - 24:00		
Leq(12)*	83.9	
Lmax **	90.3	
Standard-12Hr	87 dB(A)	
Standard-Max	140 dB(A)	

Remark : \* Average time between 09:00-21:00

\*\* Maximum Sound Pressure Level between 09:00-21:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Sununta Sirawuttinanon)  
Technical Management Team




## Noise Monitoring Result : Working Noise MTR-CPL

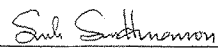
Location : Hydroxylamine Unit (1210-PB1)	Monitor Period : Mar 09, 2022
SLM Model : CASELLA CEL-246	Serial No : 3173108
Site Operator : Mr. Jeerawat Khotamhan	
Calibrator Model : CASELLA CEL120/2	Serial No : 2839225
Calibration Ref dB(A) : 114.0	Certified Date : Dec 24, 2021
SLM Reading / Adjust dB(A) : 114.0/0.0	Expire Date : Dec 23, 2022
Cal Sheet No.: CEL120/2-2022-022	

Time	Equivalent Sound Pressure Level (dB(A))
	Mar 09, 2022
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	83.3
09:00 - 10:00	83.5
10:00 - 11:00	83.9
11:00 - 12:00	83.1
12:00 - 13:00	83.0
13:00 - 14:00	82.8
14:00 - 15:00	82.7
15:00 - 16:00	82.9
16:00 - 17:00	83.0
17:00 - 18:00	83.0
18:00 - 19:00	82.9
19:00 - 20:00	82.9
20:00 - 21:00	
21:00 - 22:00	
22:00 - 23:00	
23:00 - 24:00	
Leq(12)*	83.1
Lmax **	103.0
Standard-12Hr	87 dB(A)
Standard-Max	140 dB(A)

Remark : \* Average time between 08:00-20:00

\*\* Maximum Sound Pressure Level between 08:00-20:00

  
(Miss Katesarin Vorradeewittaya)  
Environmental Scientist

  
(Miss Sununta Sirawuttinanon)  
Technical Management Team




## Noise Monitoring Result : Working Noise MTR-CPL


Location : Hydroxylamine Unit 1210-PB1	Monitor Period : May 18, 2022
SLM Model : CASELLA CEL-246	Serial No : 3173306
Site Operator : Mr. Phakphum Thanthai	
Calibrator Model : CASELLA CEL120/2	Serial No : 2839225
Calibration Ref dB(A) : 114.0	Certified Date : Dec 24, 2021
SLM Reading / Adjust dB(A) : 114.0/0.0	Expire Date : Dec 23, 2022
Cal Sheet No.: CEL120/2-2022-056	

Time	Equivalent Sound Pressure Level (dB(A))
	May 18, 2022
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	87.1
10:00 - 11:00	87.1
11:00 - 12:00	87.2
12:00 - 13:00	86.9
13:00 - 14:00	86.3
14:00 - 15:00	85.9
15:00 - 16:00	86.0
16:00 - 17:00	86.0
17:00 - 18:00	86.1
18:00 - 19:00	86.1
19:00 - 20:00	86.0
20:00 - 21:00	86.0
21:00 - 22:00	
22:00 - 23:00	
23:00 - 24:00	
Leq(12)*	86.4
Lmax **	91.8
Standard-12Hr	87 dB(A)
Standard-Max	140 dB(A)

Remark : \* Average time between 09:00-21:00

\*\* Maximum Sound Pressure Level between 09:00-21:00

  
(Miss Katesarin Vorradeewittaya)  
Environmental Scientist

  
(Miss Sununta Sirawuttinanon)  
Technical Management Team



## Noise Monitoring Result : Working Noise MTR-CPL

Location : Refrigeration Unit (2500-K1) Monitor Period : Jan 05, 2022  
SLM Model : CASELLA CEL-246 Serial No : 3173125  
Site Operator : Mr.Natchapon Kadu

Calibrator Model : CASELLA CEL120/2 Serial No : 2839225  
Calibration Ref dB(A) : 114.0 Certified Date : Dec 24, 2021  
SLM Reading / Adjust dB(A) : 113.6/0.4 Expire Date : Dec 23, 2022  
Cal Sheet No.: CEL120/2-2022-002

Time	Equivalent Sound Pressure Level (dB(A))	
	Jan 05, 2022	
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	85.0	
10:00 - 11:00	84.7	
11:00 - 12:00	84.2	
12:00 - 13:00	84.5	
13:00 - 14:00	84.7	
14:00 - 15:00	84.9	
15:00 - 16:00	85.1	
16:00 - 17:00	85.2	
17:00 - 18:00	85.5	
18:00 - 19:00	85.6	
19:00 - 20:00	85.7	
20:00 - 21:00	85.6	
21:00 - 22:00		
22:00 - 23:00		
23:00 - 24:00		
Leq(12)*	85.1	
Lmax **	89.1	
Standard-12Hr	87 dB(A)	
Standard-Max	140 dB(A)	

Remark : \* Average time between 09:00-21:00  
\*\* Maximum Sound Pressure Level between 09:00-21:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Sununta Sirawuttinanon)  
Technical Management Team



## Noise Monitoring Result : Working Noise MTR-CPL

Location : Refrigeration Unit 2510-K1 Monitor Period : May 18, 2022  
SLM Model : CASELLA CEL-246 Serial No : 1443817  
Site Operator : Mr. Phakphum Thanthai

Calibrator Model : CASELLA CEL120/2 Serial No : 2839225  
Calibration Ref dB(A) : 114.0 Certified Date : Dec 24, 2021  
SLM Reading / Adjust dB(A) : 113.0/1.0 Expire Date : Dec 23, 2022  
Cal Sheet No.: CEL120/2-2022-056

Time	Equivalent Sound Pressure Level (dB(A))	
	May 18, 2022	
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	83.1	
10:00 - 11:00	83.1	
11:00 - 12:00	82.9	
12:00 - 13:00	83.5	
13:00 - 14:00	83.3	
14:00 - 15:00	82.4	
15:00 - 16:00	82.4	
16:00 - 17:00	82.3	
17:00 - 18:00	82.6	
18:00 - 19:00	82.6	
19:00 - 20:00	82.4	
20:00 - 21:00	82.5	
21:00 - 22:00		
22:00 - 23:00		
23:00 - 24:00		
Leq(12)*	82.8	
Lmax **	104.0	
Standard-12Hr	87 dB(A)	
Standard-Max	140 dB(A)	

Remark : \* Average time between 09:00-21:00  
\*\* Maximum Sound Pressure Level between 09:00-21:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Sununta Sirawuttinanon)  
Technical Management Team





## Noise Monitoring Result : Working Noise MTR-CPL

Location : SA & WLC 4140-1  
SLM Model : CASELLA CEL-246  
Site Operator : Mr. Phakphum Thanthai

Monitor Period : May 18, 2022  
Serial No : 3173311

Calibrator Model : CASELLA CEL120/2  
Calibration Ref dB(A) : 114.0  
SLM Reading / Adjust dB(A) : 114.0/0.0  
Cal Sheet No.: CEL120/2-2022-056

Serial No : 2839225  
Certified Date : Dec 24, 2021  
Expire Date : Dec 23, 2022

Time	Equivalent Sound Pressure Level (dB(A))	
	May 18, 2022	
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	86.0	
10:00 - 11:00	85.4	
11:00 - 12:00	85.9	
12:00 - 13:00	86.8	
13:00 - 14:00	86.8	
14:00 - 15:00	87.3	
15:00 - 16:00	87.6	
16:00 - 17:00	86.4	
17:00 - 18:00	87.0	
18:00 - 19:00	87.0	
19:00 - 20:00	87.1	
20:00 - 21:00	87.0	
21:00 - 22:00		
22:00 - 23:00		
23:00 - 24:00		
Leq(12)*	86.7	
Lmax **	93.5	
Standard-12Hr	87 dB(A)	
Standard-Max	140 dB(A)	

Remark : \* Average time between 09:00-21:00  
\*\* Maximum Sound Pressure Level between 09:00-21:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Sununta Sirawuttinanon)  
Technical Management Team



## Noise Monitoring Result : Working Noise MTR-CPL

Location : SA & WLC (4140-1)  
SLM Model : CASELLA CEL-246  
Site Operator : Mr. Jeerawat Khothamhan

Monitor Period : Mar 09, 2022  
Serial No : 3173125

Calibrator Model : CASELLA CEL120/2  
Calibration Ref dB(A) : 114.0  
SLM Reading / Adjust dB(A) : 114.0/0.0  
Cal Sheet No.: CEL120/2-2022-022

Serial No : 2839225  
Certified Date : Dec 24, 2021  
Expire Date : Dec 23, 2022

Time	Equivalent Sound Pressure Level (dB(A))	
	Mar 09, 2022	
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	81.5	
09:00 - 10:00	81.7	
10:00 - 11:00	81.4	
11:00 - 12:00	81.4	
12:00 - 13:00	81.4	
13:00 - 14:00	81.4	
14:00 - 15:00	81.6	
15:00 - 16:00	81.5	
16:00 - 17:00	81.5	
17:00 - 18:00	82.0	
18:00 - 19:00	81.6	
19:00 - 20:00	81.6	
20:00 - 21:00		
21:00 - 22:00		
22:00 - 23:00		
23:00 - 24:00		
Leq(12)*	81.6	
Lmax **	85.3	
Standard-12Hr	87 dB(A)	
Standard-Max	140 dB(A)	

Remark : \* Average time between 08:00-20:00  
\*\* Maximum Sound Pressure Level between 08:00-20:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Sununta Sirawuttinanon)  
Technical Management Team



## Noise Monitoring Result : Working Noise MTR-CPL

Location : Wastewater Treatment (4700-B1) Monitor Period : Mar 09, 2022  
SLM Model : CASELLA CEL-246 Serial No : 3173135  
Site Operator : Mr. Jeerawat Khotamhan

Calibrator Model : CASELLA CEL120/2 Serial No : 2839225  
Calibration Ref dB(A) : 114.0 Certified Date : Dec 24, 2021  
SLM Reading / Adjust dB(A) : 114.0/0.0 Expire Date : Dec 23, 2022  
Cal Sheet No.: CEL120/2-2022-022

Time	Equivalent Sound Pressure Level (dB(A))	
	Mar 09, 2022	
00:00 - 01:00		
01:00 - 02:00		
02:00 - 03:00		
03:00 - 04:00		
04:00 - 05:00		
05:00 - 06:00		
06:00 - 07:00		
07:00 - 08:00		
08:00 - 09:00	85.8	
09:00 - 10:00	85.6	
10:00 - 11:00	85.6	
11:00 - 12:00	85.8	
12:00 - 13:00	86.0	
13:00 - 14:00	86.1	
14:00 - 15:00	86.1	
15:00 - 16:00	86.1	
16:00 - 17:00	85.7	
17:00 - 18:00	85.9	
18:00 - 19:00	86.0	
19:00 - 20:00	85.9	
20:00 - 21:00		
21:00 - 22:00		
22:00 - 23:00		
23:00 - 24:00		

Leq(12)*	85.9
Lmax **	89.1
Standard-12Hr	87 dB(A)
Standard-Max	140 dB(A)

Remark : \* Average time between 08:00-20:00  
\*\* Maximum Sound Pressure Level between 08:00-20:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Sununta Sirawuttinanon)  
Technical Management Team



## Noise Monitoring Result : Working Noise MTR-CPL

Location : Wastewater Treatment 4700-B1 Monitor Period : May 18, 2022  
SLM Model : CASELLA CEL-246 Serial No : 3173156  
Site Operator : Mr. Phakphum Thanthai

Calibrator Model : CASELLA CEL120/2 Serial No : 2839225  
Calibration Ref dB(A) : 114.0 Certified Date : Dec 24, 2021  
SLM Reading / Adjust dB(A) : 114.0/0.0 Expire Date : Dec 23, 2022  
Cal Sheet No.: CEL120/2-2022-056

Time	Equivalent Sound Pressure Level (dB(A))	
	May 18, 2022	
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	87.1	
10:00 - 11:00	87.1	
11:00 - 12:00	87.4	
12:00 - 13:00	86.9	
13:00 - 14:00	86.7	
14:00 - 15:00	86.6	
15:00 - 16:00	86.7	
16:00 - 17:00	86.7	
17:00 - 18:00	86.7	
18:00 - 19:00	86.8	
19:00 - 20:00	86.7	
20:00 - 21:00	86.8	
21:00 - 22:00		
22:00 - 23:00		
23:00 - 24:00		

Leq(12)*	86.9
Lmax **	89.6
Standard-12Hr	87 dB(A)
Standard-Max	140 dB(A)

Remark : \* Average time between 09:00-21:00  
\*\* Maximum Sound Pressure Level between 09:00-21:00

(Miss Katesarin Vorradetwittaya)  
Environmental Scientist

(Miss Sununta Sirawuttinanon)  
Technical Management Team

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ใบรับรองผลการตรวจวัดระดับเสียงเฉลี่ยที่ถูกร้างได้รับเฉลี่ย  
ตลอดเวลาการทำงาน (TWA)



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

#### NOISE MEASUREMENT REPORT : NOISE DOSE

CLIENT NAME : UBE Chemicals (Asia) Public Co., Ltd. REFERENCE NO. : 221030 (Cert.)/Jan/Noise Dose  
MEASUREMENT BY : SECOT Co., Ltd. INSTRUMENT : Noise Dosimeter  
MEASUREMENT DATE : 05/01/2022 CALIBRATOR MODEL: RC 110 A  
MEASUREMENT LOCATION : CPL CALIBRATOR TYPE : Calibrator SERIAL NO. : 95168  
SITE OPERATOR : Mr. Natchapon Kadu CALIBRATION REF. : 114 dB @1,000 Hz

USER ID	AREA/PLANT	TIME	%Dose	SOUND PRESSURE LEVEL (dBA)	
				TWA (12-hr)	STANDARD*
260	1110-K1	08.21 -19.00	39.3	79.2	83.0
90379	4140-B1	08.07 -19.00	83.4	82.5	83.0
90587	1210-PB1	08.07 -19.00	82.7	82.4	83.0
90835	2510-K1	08.22 -19.00	55.1	80.7	83.0
19054	4700-B1	08.10 -19.00	10.0	75.1	83.0

  
(Miss Katesarin Vorraderwittaya)

Environmental Scientist

  
(Miss Sununta Siravuttinanon)

Technical Management Team

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



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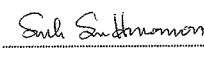
#### NOISE MEASUREMENT REPORT : NOISE DOSE

CLIENT NAME : UBE Chemicals (Asia) Public Co., Ltd. REFERENCE NO. : 222030 (Cert.)/May/Noise Dose  
MEASUREMENT BY : SECOT Co., Ltd. INSTRUMENT : Noise Dosimeter  
MEASUREMENT DATE : 18/05/2022 CALIBRATOR MODEL: RC 110 A  
MEASUREMENT LOCATION : CPL CALIBRATOR TYPE : Calibrator SERIAL NO. : 95168  
SITE OPERATOR : Mr. Phakphum Thanthai CALIBRATION REF. : 114 dB @1,000 Hz

USER ID	AREA/PLANT	TIME	%Dose	SOUND PRESSURE LEVEL (dBA)	
				TWA (12-hr)	STANDARD*
90617	1110-K1	07.05-19.25	72.9	81.9	83.0
19043	4700-B1	07.06-19.26	33.4	78.5	83.0

  
(Miss Katesarin Vorraderwittaya)

Environmental Scientist

  
(Miss Sununta Siravuttinanon)

Technical Management Team

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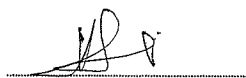
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TEL : +66(0) 2959-3600 FAX : +66(0) 2959-3535 E-mail : envserv@secot.co.th

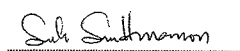
### NOISE MEASUREMENT REPORT : NOISE DOSE

CLIENT NAME : UBE Chemicals (Asia) Public Co., Ltd. REFERENCE NO. : 222030 (Cert.)/Jun/Noise Dose  
MEASUREMENT BY : SECOT Co., Ltd. INSTRUMENT : Noise Dosimeter  
MEASUREMENT DATE : 14/06/2022 CALIBRATOR MODEL : RC 110 A  
MEASUREMENT LOCATION : CPL CALIBRATOR TYPE : Calibrator SERIAL NO. : 95168  
SITE OPERATOR : Mr. Baworn Deechaiya CALIBRATION REF. : 114 dB @1,000 Hz

USER ID	AREA/PLANT	TIME	%Dose	SOUND PRESSURE LEVEL (dBA)	
				TWA (12-hr)	STANDARD*
90379	4140-B1	07.34-19.00	58.5	80.9	83.0
91197	1210-PB1	07.39-19.00	87.1	82.6	83.0
19054	2510-K1	07.29-19.00	23.7	77.0	83.0

  
(Miss Katesarin Vorradetwittaya)

Environmental Scientist

  
(Miss Sununta Sirawuttinanon)

Technical Management Team

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## ภาคผนวก ง.4

### ใบรับรองผลการวิเคราะห์คุณภาพน้ำทิ้ง

---

บริเวณจุดระบายน้ำเข้าระบบบำบัดน้ำเสีย (Receiving Tank)  
ก่อนเข้า Equalization Cooler



## Analysis / Test Report

**Client :** UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O :** 4500126040  
**Project Name :** Environmental Monitoring  
**Project Location :** Caprolactam Plant



**TESTING**  
No.0042

**Lot ID: 21141501**

Date Received :Jan 12, 2022  
Date Reported :Jan 19, 2022  
Report Number :2163337-1

Page 1 of 1

**Sample Number** 21141501-1  
**Sampled Date** Jan 12, 2022 9:35 AM  
**Sample Description** Wastewater  
**Location** Influent (S-32-002)  
**Date Analysis Commenced** Jan 12, 2022  
**Condition of Sample** Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
<b>Water Testing</b>						
BOD (5 days at 20 Degree C)	mg/L	-	2	927	APHA (2017), 5210 B	Rayong
COD	mg/L	1.5	5	1799	APHA (2017), 5220 D	Rayong
Oil & Grease	mg/L	-	3	3	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C		-	-	9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	35.6	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	2000	APHA (2017), 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	291	APHA (2017), 4500-Norg (C), NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	37	APHA (2017), 2540 D	Rayong

**Sampled By :** Tanasit Wongsachai

Remark :  
- LOD : Limit of Detection  
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)  
- Analyte(s) marked \* is/are not included in scope of Accreditation ISO/IEC 17025.

Technical Management

*N. Banngkit*

Narumon Banchongkit  
Supervisor  
หมายเลขโทรศัพท์ ๖-323-๖-9445

Approved by

*D. Changchon*

Dej Changchon  
Senior Manager  
หมายเลขโทรศัพท์ ๖-323-๖-9442

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## Analysis / Test Report

**Client :** UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O :** 4500126040  
**Project Name :** Environmental Monitoring  
**Project Location :** Caprolactam Plant

**Lot ID: 21141501**

Date Received :Jan 12, 2022  
Date Reported :Jan 19, 2022  
Report Number :2163337-2

Page 1 of 1

**Sample Number** 21141501-1  
**Sampled Date** Jan 12, 2022 9:35 AM  
**Sample Description** Wastewater  
**Location** Influent (S-32-002)  
**Date Analysis Commenced** Jan 12, 2022  
**Condition of Sample** Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
<b>Water Testing</b>						
Flow rate	m3/hr	-	-	103	Flow meter	Rayong
Sulfate	mg/L	0.6	2	1494	Based on APHA (2017), 4500-SO4(E)	Rayong

**Sampled By :** Tanasit Wongsachai

Remark :  
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Approved by

*N. Banngkit*

Narumon Banchongkit  
Supervisor

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## Analysis / Test Report

**Client** : UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O** : 4500126040  
**Project Name** : Environmental Monitoring  
**Project Location** : Caprolactam Plant



TESTING  
No.0042

**Lot ID: 21148592**  
Date Received : Feb 02, 2022  
Date Reported : Feb 08, 2022  
Report Number : 2182776-1

Page 1 of 1

**Sample Number** : 21148592-1  
**Sampled Date** : Feb 02, 2022 10:46 AM  
**Sample Description** : Wastewater  
**Location** : Influent (S-32-002)  
**Date Analysis Commenced** : Feb 02, 2022  
**Condition of Sample** : Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
<b>Water Testing</b>						
BOD (5 days at 20 Degree C)	mg/L	-	2	951	APHA (2017), 5210 B	Rayong
COD	mg/L	1.5	5	2119	APHA (2017), 5220 D	Rayong
Oil & Grease	mg/L	-	3	10	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C		-	-	9.7	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	34.3	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	2100	APHA (2017), 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	355	APHA (2017), 4500-Norg (C), NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	26	APHA (2017), 2540 D	Rayong

**Sampled By** : Tanasit Wongsachai

Remark :  
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Technical Management

N. Banongkit

Narumon Banchongkit  
Supervisor  
ทะเบียนเลขที่ 7-323-2-9445

Approved by

D. Changchon

Dej Changchon  
Manager  
ทะเบียนเลขที่ 7-225-ก-5283

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## Analysis / Test Report

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140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O** : 4500126040  
**Project Name** : Environmental Monitoring  
**Project Location** : Caprolactam Plant

**Lot ID: 21148592**  
Date Received : Feb 02, 2022  
Date Reported : Feb 08, 2022  
Report Number : 2182776-2

Page 1 of 1

**Sample Number** : 21148592-1  
**Sampled Date** : Feb 02, 2022 10:46 AM  
**Sample Description** : Wastewater  
**Location** : Influent (S-32-002)  
**Date Analysis Commenced** : Feb 02, 2022  
**Condition of Sample** : Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
<b>Water Testing</b>						
Flow rate	m3/h	-	-	75.00	Flow meter	Rayong
Sulfate	mg/L	0.6	2	960	Based on APHA (2017), 4500-SO4(E)	Rayong

**Sampled By** : Tanasit Wongsachai

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## Analysis / Test Report

**Client :** UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O :** 4500126040  
**Project Name :** Environmental Monitoring  
**Project Location :** Caprolactam Plant



**TESTING**  
**No.0042**

**Lot ID: 2214519**  
Date Received : Mar 02, 2022  
Date Reported : Mar 09, 2022  
Report Number : 2220834-1

Page 1 of 1

**Sample Number** 2214519-1  
**Sampled Date** Mar 02, 2022 11:46 AM  
**Sample Description** Wastewater  
**Location** Influent (S-32-002)  
**Date Analysis Commenced** Mar 02, 2022  
**Condition of Sample** Contained in one amber glass bottle and three plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
<b>Water Testing</b>						
BOD (5 days at 20 Degree C)	mg/L	-	2	656	APHA (2017), 5210 B	Rayong
COD	mg/L	1.5	5	1230	APHA (2017), 5220 D	Rayong
Oil & Grease	mg/L	-	3	5	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C		-	-	9.2	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	33.1	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	1000	APHA (2017), 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	69.8	APHA (2017), 4500-Norg (C), NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	23	APHA (2017), 2540 D	Rayong

**Sampled By :** Tanasit Wongsachai

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Technical Management

*N. Banongkit*

Narumon Banchongkit  
Supervisor  
หมายเลขโทรศัพท์ 323-9-9445

Approved by

*D. Changchon*

Dej Changchon  
Manager  
หมายเลขโทรศัพท์ 225-5-5283

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## Analysis / Test Report

**Client :** UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O :** 4500126040  
**Project Name :** Environmental Monitoring  
**Project Location :** Caprolactam Plant

**Lot ID: 2214519**  
Date Received : Mar 02, 2022  
Date Reported : Mar 09, 2022  
Report Number : 2220834-2

Page 1 of 1

**Sample Number** 2214519-1  
**Sampled Date** Mar 02, 2022 11:46 AM  
**Sample Description** Wastewater  
**Location** Influent (S-32-002)  
**Date Analysis Commenced** Mar 02, 2022  
**Condition of Sample** Contained in one amber glass bottle and three plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
<b>Water Testing</b>						
Flow rate	m3/h	-	-	120	Flow meter	Rayong
Sulfate	mg/L	0.6	2	85.5	Based on APHA (2017), 4500-SO4(E)	Rayong

**Sampled By :** Tanasit Wongsachai

**Remark :**  
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Approved by

*N. Banongkit*

Narumon Banchongkit  
Supervisor

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## Analysis / Test Report

TESTING  
No.0042

**Client** : UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O** : 4500138258  
**Project Name** : Environmental Monitoring  
**Project Location** : Caprolactam Plant

**Lot ID: 2232029**  
Date Received : Apr 07, 2022  
Date Reported : Apr 18, 2022  
Report Number : 2259635-1

Page 1 of 1

<b>Sample Number</b>	2232029-1
<b>Sampled Date</b>	Apr 07, 2022 9:26 AM
<b>Sample Description</b>	Wastewater
<b>Location</b>	Influent (S-32-002)
<b>Date Analysis Commenced</b>	Apr 07, 2022
<b>Condition of Sample</b>	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
<b>Water Testing</b>						
BOD (5 days at 20 Degree C)	mg/L	-	2	831	APHA (2017), 5210 B	Rayong
COD	mg/L	1.5	5	1486	APHA (2017), 5220 D	Rayong
Oil & Grease	mg/L	-	3	4	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C		-	-	8.9	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	34.5	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	2900	APHA (2017), 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	262	APHA (2017), 4500-Norg (C), NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	26	APHA (2017), 2540 D	Rayong

**Sampled By** : Tanasit Wongsachai

Remark :

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- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
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Technical Management

*N. Banngkit*

Narumon Banchongkit  
Supervisor  
หมายเลขโทรศัพท์ 3-323-3-9445

Approved by

*D. Changchon*

Dej Changchon  
Manager  
หมายเลขโทรศัพท์ 3-225-3-5283

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## Analysis / Test Report

**Client** : UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O** : 4500138258  
**Project Name** : Environmental Monitoring  
**Project Location** : Caprolactam Plant

**Lot ID: 2232029**  
Date Received : Apr 07, 2022  
Date Reported : Apr 18, 2022  
Report Number : 2259635-2

Page 1 of 1

<b>Sample Number</b>	2232029-1
<b>Sampled Date</b>	Apr 07, 2022 9:26 AM
<b>Sample Description</b>	Wastewater
<b>Location</b>	Influent (S-32-002)
<b>Date Analysis Commenced</b>	Apr 07, 2022
<b>Condition of Sample</b>	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
<b>Water Testing</b>						
Flow rate	m3/h	-	-	170	Flow meter	Rayong
Sulfate	mg/L	0.6	2	1578	Based on APHA (2017), 4500-SO4(E)	Rayong

**Sampled By** : Tanasit Wongsachai

Remark :

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- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

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## Analysis / Test Report

**Client :** UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O :** 4500138258  
**Project Name :** Environmental Monitoring  
**Project Location :** Caprolactam Plant

**Lot ID: 2232130**  
Date Received : May 06, 2022  
Date Reported : May 12, 2022  
Report Number : 2259641-1

TESTING  
No.0042

Page 1 of 1

**Sample Number** 2232130-1  
**Sampled Date** May 06, 2022 11:00 AM  
**Sample Description** Wastewater  
**Location** Influent (S-32-002)  
**Date Analysis Commenced** May 06, 2022  
**Condition of Sample** Contained in one amber glass bottle and three plastic bottles. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
<b>Water Testing</b>						
BOD (5 days at 20 Degree C)	mg/L	-	2	860	APHA (2017), 5210 B	Rayong
COD	mg/L	1.5	5	1558	APHA (2017), 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C		-	-	9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	33.7	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	1840	APHA (2017), 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	135	APHA (2017), 4500-Norg (C), NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	22	APHA (2017), 2540 D	Rayong

**Sampled By :** Tanasit Wongsachai

**Remark :**  
- LOD : Limit of Detection  
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)  
- Analyte(s) marked \* is/are not included in scope of Accreditation ISO/IEC 17025.

Technical Management

*N. Banongkit*

Narumon Banchongkit  
Supervisor  
หมายเลขโทรศัพท์ 7-323-9-9445

Approved by

*D. Changchon*

Dej Changchon  
Senior Manager  
หมายเลขโทรศัพท์ 7-323-9-9442

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## Analysis / Test Report

**Client :** UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O :** 4500138258  
**Project Name :** Environmental Monitoring  
**Project Location :** Caprolactam Plant

**Lot ID: 2232130**  
Date Received : May 06, 2022  
Date Reported : May 12, 2022  
Report Number : 2259641-2

Page 1 of 1

**Sample Number** 2232130-1  
**Sampled Date** May 06, 2022 11:00 AM  
**Sample Description** Wastewater  
**Location** Influent (S-32-002)  
**Date Analysis Commenced** May 06, 2022  
**Condition of Sample** Contained in one amber glass bottle and three plastic bottles. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
<b>Water Testing</b>						
Flow rate	m3/hr	-	-	140	Flow meter	Rayong
Sulfate	mg/L	0.6	2	906	Based on APHA (2017), 4500-SO4(E)	Rayong

**Sampled By :** Tanasit Wongsachai

**Remark :**  
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- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

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## Analysis / Test Report

**Client :** UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O :** 4500138258  
**Project Name :** Environmental Monitoring  
**Project Location :** Caprolactam Plant



**TESTING**  
No.0042

**Lot ID: 2267344**  
Date Received :Jun 02, 2022  
Date Reported :Jun 10, 2022  
Report Number :2330409-1

Page 1 of 1

**Sample Number** 2267344-1  
**Sampled Date** Jun 02, 2022 11:10 AM  
**Sample Description** Wastewater  
**Location** Influent (S-32-002)  
**Date Analysis Commenced** Jun 02, 2022  
**Condition of Sample** Contained in one amber glass bottle and three plastic bottles, Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
<b>Water Testing</b>						
BOD (5 days at 20 Degree C)	mg/L	-	2	771	APHA (2017), 5210 B	Rayong
COD	mg/L	1.5	5	1390	APHA (2017), 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C		-	-	8.9	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	37.1	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	1640	APHA (2017), 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	286	APHA (2017), 4500-Norg (C), NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	29	APHA (2017), 2540 D	Rayong

**Sampled By :** Narunat thammassaro

**Remark :**  
- LOD : Limit of Detection  
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)  
- Analyte(s) marked \* is/are not included in scope of Accreditation ISO/IEC 17025.  
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

*N. Banongkit*

Narumon Banchongkit  
Supervisor  
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Approved by

*D. Changchon*

Dej Changchon  
Senior Manager  
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## Analysis / Test Report

**Client :** UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O :** 4500138258  
**Project Name :** Environmental Monitoring  
**Project Location :** Caprolactam Plant

**Lot ID: 2267344**  
Date Received :Jun 02, 2022  
Date Reported :Jun 10, 2022  
Report Number :2330409-2

Page 1 of 1

**Sample Number** 2267344-1  
**Sampled Date** Jun 02, 2022 11:10 AM  
**Sample Description** Wastewater  
**Location** Influent (S-32-002)  
**Date Analysis Commenced** Jun 02, 2022  
**Condition of Sample** Contained in one amber glass bottle and three plastic bottles, Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
<b>Water Testing</b>						
Flow rate	m3/hr.	-	-	170.0	Flow meter	Rayong
Sulfate	mg/L	0.6	2	1583	Based on APHA (2017), 4500-SO4(E)	Rayong

**Sampled By :** Narunat thammassaro

**Remark :**  
- LOD : Limit of Detection  
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## Analysis / Test Report

**Client :** UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O :** 4500126040  
**Project Name :** Environmental Monitoring  
**Project Location :** Caprolactam Plant

**TESTING**  
No.0042  
**Lot ID: 21141478**  
Date Received : Jan 05, 2022  
Date Reported : Jan 12, 2022  
Report Number : 2163311-1

Page 1 of 1

**Sample Number** 21141478-1  
**Sampled Date** Jan 05, 2022 9:55 AM  
**Sample Description** Wastewater  
**Location** Effluent (S-32-104)  
**Date Analysis Commenced** Jan 05, 2022  
**Condition of Sample** Contained in two amber glass bottles and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
BOD (5 days at 20 Degree C)	mg/L	-	2	<2	≤20	APHA (2017), 5210 B	Rayong
COD	mg/L	1.5	5	53	≤120	APHA (2017), 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤5	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C	-	-	-	7.9	5.5-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	34.1	≤40	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	4500	(1)	APHA (2017), 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	1.1	≤100	APHA (2017), 4500-Norg (C), NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	APHA (2017), 2540 D	Rayong

**Guideline :** Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).  
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.  
**Sampled By :** Tanasit Wongsachai

**Remark :**  
- LOD : Limit of Detection  
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)  
- Analyte(s) marked \* is/are not included in scope of Accreditation ISO/IEC 17025.

Technical Management

*N. Banchongkit*

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Approved by

*D. Changchon*

Dej Changchon  
Senior Manager  
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## Analysis / Test Report

**Client :** UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O :** 4500126040  
**Project Name :** Environmental Monitoring  
**Project Location :** Caprolactam Plant

**Lot ID: 21141478**  
Date Received : Jan 05, 2022  
Date Reported : Jan 12, 2022  
Report Number : 2163311-2

Page 1 of 1

**Sample Number** 21141478-1  
**Sampled Date** Jan 05, 2022 9:55 AM  
**Sample Description** Wastewater  
**Location** Effluent (S-32-104)  
**Date Analysis Commenced** Jan 05, 2022  
**Condition of Sample** Contained in two amber glass bottles and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
Flow rate	m3/hr	-	-	113	No Standard	Flow meter	Rayong
Sulfate	mg/L	0.6	2	2106	No Standard	Based on APHA (2017), 4500-SO4(E)	Rayong

**Guideline :** Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).  
(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.  
**Sampled By :** Tanasit Wongsachai

**Remark :**  
- LOD : Limit of Detection  
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Approved by

*N. Banchongkit*

Narumon Banchongkit  
Supervisor

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## Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000

P/O : 4500126040

Project Name : Environmental Monitoring

Project Location: Caprolactam Plant

TESTING  
No.0042  
**Lot ID: 21148574**

Date Received : Feb 02, 2022

Date Reported : Feb 08, 2022

Report Number : 2182756-1

Page 1 of 1

**Sample Number** 21148574-1  
**Sampled Date** Feb 02, 2022 9:25 AM  
**Sample Description** Wastewater  
**Location** Effluent (S-32-104)  
**Date Analysis Commenced** Feb 02, 2022  
**Condition of Sample** Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
BOD (5 days at: 20 Degree C)	mg/L	-	2	<2	≤20	APHA (2017), 5210 B	Rayong
COD	mg/L	1.5	5	96	≤120	APHA (2017), 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤5	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C		-	-	7.4	5.5-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	33.3	≤40	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	4580	(1)	APHA (2017), 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	1.5	≤100	APHA (2017), 4500-Norg (C), NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	APHA (2017), 2540 D	Rayong

**Guideline :** Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).

(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.

**Sampled By :** Tanasit Wongsachai

Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked \* is/are not included in scope of Accreditation ISO/IEC 17025.

Technical Management

*N. Banongkit*

Narumon Banchongkit  
Supervisor

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Approved by

*D. Changchon*

Dej Changchon  
Senior Manager

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## Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000

P/O : 4500126040

Project Name : Environmental Monitoring

Project Location: Caprolactam Plant

**Lot ID: 21148574**

Date Received : Feb 02, 2022

Date Reported : Feb 08, 2022

Report Number : 2182756-2

Page 1 of 1

**Sample Number** 21148574-1  
**Sampled Date** Feb 02, 2022 9:25 AM  
**Sample Description** Wastewater  
**Location** Effluent (S-32-104)  
**Date Analysis Commenced** Feb 02, 2022  
**Condition of Sample** Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
Flow rate	m3/h	-	-	127	No Standard	Flow meter	Rayong
Sulfate	mg/L	0.6	2	1662	No Standard	Based on APHA (2017), 4500-SO4(E)	Rayong

**Guideline :** Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).

(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.

**Sampled By :** Tanasit Wongsachai

Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Approved by

*N. Banongkit*

Narumon Banchongkit  
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## Analysis / Test Report

**Client :** UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O :** 4500126040  
**Project Name :** Environmental Monitoring  
**Project Location:** Caprolactam Plant

**TESTING**  
No.0042  
**Lot ID: 2214495**  
Date Received : Mar 02, 2022  
Date Reported : Mar 09, 2022  
Report Number : 2220815-1

Page 1 of 1

**Sample Number** 2214495-1  
**Sampled Date** Mar 02, 2022 9:40 AM  
**Sample Description** Wastewater  
**Location** Effluent (S-32-104)  
**Date Analysis Commenced** Mar 02, 2022  
**Condition of Sample** Contained in one amber glass bottle and three plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
BOD (5 days at 20 Degree C)	mg/L	-	2	3	≤20	APHA (2017), 5210 B	Rayong
COD	mg/L	1.5	5	34	≤120	APHA (2017), 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤5	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C		-	-	7.9	5.5-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	34.0	≤40	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	572	(1)	APHA (2017), 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	2.5	≤100	APHA (2017), 4500-Norg (C), NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	7	≤50	APHA (2017), 2540 D	Rayong

**Guideline :** Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).

(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.

**Sampled By :** Tanasit Wongsachai

**Remark :**

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked \* is/are not included in scope of Accreditation ISO/IEC 17025.

Technical Management

N. Banphit

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Approved by

D. Changchon

Dej Changchon  
Senior Manager  
หมายเลขโทรศัพท์ ๖-323-๙-9442

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## Analysis / Test Report

**Client :** UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O :** 4500126040  
**Project Name :** Environmental Monitoring  
**Project Location:** Caprolactam Plant

**Lot ID: 2214495**  
Date Received : Mar 02, 2022  
Date Reported : Mar 09, 2022  
Report Number : 2220815-2

Page 1 of 1

**Sample Number** 2214495-1  
**Sampled Date** Mar 02, 2022 9:40 AM  
**Sample Description** Wastewater  
**Location** Effluent (S-32-104)  
**Date Analysis Commenced** Mar 02, 2022  
**Condition of Sample** Contained in one amber glass bottle and three plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
Flow rate	m3/h	-	-	139	No Standard	Flow meter	Rayong
Sulfate	mg/L	0.6	2	223	No Standard	Based on APHA (2017), 4500-SO4(E)	Rayong

**Guideline :** Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).

(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.

**Sampled By :** Tanasit Wongsachai

**Remark :**

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Approved by

N. Banphit

Narumon Banchongkit  
Supervisor

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## Analysis / Test Report

**Client :** UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O :** 4500138258  
**Project Name :** Environmental Monitoring  
**Project Location :** Caprolactam Plant

**TESTING**  
**No.0042**  
**Lot ID: 2232012**  
Date Received : Apr 07, 2022  
Date Reported : Apr 18, 2022  
Report Number : 2256655-1

Page 1 of 1

<b>Sample Number</b>	2232012-1						
<b>Sampled Date</b>	Apr 07, 2022 9:40 AM						
<b>Sample Description</b>	Wastewater						
<b>Location</b>	Effluent (S-32-104)						
<b>Date Analysis Commenced</b>	Apr 07, 2022						
<b>Condition of Sample</b>	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
BOD (5 days at 20 Degree C)	mg/L	-	2	5	≤20	APHA (2017), 5210 B	Rayong
COD	mg/L	1.5	5	26	≤120	APHA (2017), 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤5	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C		-	-	7.8	5.5-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	35.4	≤40	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	2380	≤5000(1)	APHA (2017), 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	<1.0	≤100	APHA (2017), 4500-Norg (C), NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	5	≤50	APHA (2017), 2540 D	Rayong

**Guideline :** Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).

(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.

**Note :** For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

**Sampled By :** Tanasit Wongsachai

Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked \* is/are not included in scope of Accreditation ISO/IEC 17025.

Technical Management

*N. Banphit*

Narumon Banchongkit  
Supervisor

หมายเลขโทรศัพท์ ๖-323-๙-๙445

Approved by

*D. Changchon*

Dej Changchon  
Senior Manager

หมายเลขโทรศัพท์ ๖-323-๙-๙442

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## Analysis / Test Report

**Client :** UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O :** 4500138258  
**Project Name :** Environmental Monitoring  
**Project Location :** Caprolactam Plant

**Lot ID: 2232012**  
Date Received : Apr 07, 2022  
Date Reported : Apr 18, 2022  
Report Number : 2256655-2

Page 1 of 1

<b>Sample Number</b>	2232012-1						
<b>Sampled Date</b>	Apr 07, 2022 9:40 AM						
<b>Sample Description</b>	Wastewater						
<b>Location</b>	Effluent (S-32-104)						
<b>Date Analysis Commenced</b>	Apr 07, 2022						
<b>Condition of Sample</b>	Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
Flow rate	m3/h	-	-	116	No Standard	Flow meter	Rayong
Sulfate	mg/L	0.6	2	1105	No Standard	Based on APHA (2017), 4500-SO4(E)	Rayong

**Guideline :** Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).

(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.

**Note :** For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

**Sampled By :** Tanasit Wongsachai

Remark :

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## Analysis / Test Report

**Client :** UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O :** 4500138258  
**Project Name :** Environmental Monitoring  
**Project Location :** Caprolactam Plant

**TESTING**  
No.0042  
**Lot ID: 2232106**  
Date Received : May 06, 2022  
Date Reported : May 12, 2022  
Report Number : 2256748-1

Page 1 of 1

**Sample Number** 2232106-1  
**Sampled Date** May 06, 2022 9:30 AM  
**Sample Description** Wastewater  
**Location** Effluent (S-32-104)  
**Date Analysis Commenced** May 06, 2022  
**Condition of Sample** Contained in one amber glass bottle and three plastic bottles. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
BOD (5 days at 20 Degree C)	mg/L	-	2	<2	≤20	APHA (2017), 5210 B	Rayong
COD	mg/L	1.5	5	34	≤120	APHA (2017), 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤5	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C		-	-	7.7	5.5-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	33.4	≤40	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	1520	≤5000(1)	APHA (2017), 2540 C	Rayong
Total Kjeldahl Nitrogen as N	mg/L	-	1.0	1.2	≤100	APHA (2017), 4500-Norg (C), NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	APHA (2017), 2540 D	Rayong

**Guideline :** Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).

(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.

**Note :** For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

**Sampled By :** Tanasit Wongsachai

Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked \* is/are not included in scope of Accreditation ISO/IEC 17025.

Technical Management

*N. Banongkit*

Narumon Banhongkit  
Supervisor  
เบอร์โทร 323-9445

Approved by

*D. Changchon*

Dej Changchon  
Senior Manager  
เบอร์โทร 323-9442

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## Analysis / Test Report

**Client :** UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O :** 4500138258  
**Project Name :** Environmental Monitoring  
**Project Location :** Caprolactam Plant

**Lot ID: 2232106**  
Date Received : May 06, 2022  
Date Reported : May 12, 2022  
Report Number : 2256748-2

Page 1 of 1

**Sample Number** 2232106-1  
**Sampled Date** May 06, 2022 9:30 AM  
**Sample Description** Wastewater  
**Location** Effluent (S-32-104)  
**Date Analysis Commenced** May 06, 2022  
**Condition of Sample** Contained in one amber glass bottle and three plastic bottles. Sample containers comply to pretreatment - preservation standards (APHA / USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
Flow rate	m3/hr	-	-	105	No Standard	Flow meter	Rayong
Sulfate	mg/L	0.6	2	469	No Standard	Based on APHA (2017), 4500-SO4(E)	Rayong

**Guideline :** Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).

(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.

**Note :** For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

**Sampled By :** Tanasit Wongsachai

Remark :

- LOD : Limit of Detection
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Approved by

*N. Banongkit*

Narumon Banhongkit  
Supervisor

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## Analysis / Test Report

**Client :** UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O :** 4500138258  
**Project Name :** Environmental Monitoring  
**Project Location :** Caprolactam Plant



TESTING  
No.0042

**Lot ID: 2267299**  
Date Received : Jun 02, 2022  
Date Reported : Jun 10, 2022  
Report Number : 2330368-1

Page 1 of 1

<b>Sample Number</b>	2267299-1						
<b>Sampled Date</b>	Jun 02, 2022 9:30 AM						
<b>Sample Description</b>	Wastewater						
<b>Location</b>	Effluent (S-32-104)						
<b>Date Analysis Commenced</b>	Jun 02, 2022						
<b>Condition of Sample</b>	Contained in one amber glass bottle and three plastic bottles, Sample containers comply to pretreatment - preservation standards (APHA / USEPA)						
Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
BOD (5 days at 20 Degree C)	mg/L	-	2	<2	≤20	APHA (2017), 5210 B	Rayong
COD	mg/L	1.5	5	33	≤120	APHA (2017), 5220 D	Rayong
Oil & Grease	mg/L	-	3	<3	≤5	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C		-	-	7.8	5.5-9.0	Based on APHA (2017), 4500-H (B)	Rayong
Temperature *	Degree C	-	-	35.3	≤40	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	1410	≤5000(1)	APHA (2017), 2540 C	Rayong
Total Kjeldahl: Nitrogen as N	mg/L	-	1.0	<1.0	≤100	APHA (2017), 4500-Norg (C), NH3 (D)	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤50	APHA (2017), 2540 D	Rayong

**Guideline :** Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).

(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.

**Note :** For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

**Sampled By :** Narunat thammasaro

Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked \* is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

N. Banngmit

Narumon Banchongkit  
Supervisor

หมายเลขโทรศัพท์ 323-9-9445

Approved by

D. Changchon

Dej Changchon  
Senior Manager

หมายเลขโทรศัพท์ 323-9-9442

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## Analysis / Test Report

**Client :** UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O :** 4500138258  
**Project Name :** Environmental Monitoring  
**Project Location :** Caprolactam Plant

**Lot ID: 2267299**  
Date Received : Jun 02, 2022  
Date Reported : Jun 10, 2022  
Report Number : 2330368-2

Page 1 of 1

<b>Sample Number</b>	2267299-1						
<b>Sampled Date</b>	Jun 02, 2022 9:30 AM						
<b>Sample Description</b>	Wastewater						
<b>Location</b>	Effluent (S-32-104)						
<b>Date Analysis Commenced</b>	Jun 02, 2022						
<b>Condition of Sample</b>	Contained in one amber glass bottle and three plastic bottles, Sample containers comply to pretreatment - preservation standards (APHA / USEPA)						
Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
Flow rate	m3/hr.	-	-	111.0	No Standard	Flow meter	Rayong
Sulfate	mg/L	0.6	2	1016	No Standard	Based on APHA (2017), 4500-SO4(E)	Rayong

**Guideline :** Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2560 (2017).

(1) Total Dissolved Solids when discharged to receiving water having TDS > 3,000 mg/L, TDS in the to-be-discharged wastewater can exceed the TDS already found in the receiving water by not higher than 5,000 mg/L.

**Note :** For Total Dissolved Solids guideline set by Environmental Impact Assessment Report of UBE Chemicals (Asia) Public Company Limited.

**Sampled By :** Narunat thammasaro

Remark :

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## ภาคผนวก ง.5

### ใบรับรองผลการวิเคราะห์คุณภาพน้ำทะเล



## Analysis / Test Report

**Client :** UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O :** 4500126042  
**Project Name :** Environmental Monitoring  
**Project Location :** Caprolactam Plant

**Lot ID: 2214674**  
Date Received : Mar 29, 2022  
Date Reported : Apr 01, 2022  
Report Number : 2220964-1

Page 1 of 12

**Sample Number** 2214674-1  
**Sampled Date** Mar 29, 2022 8:55 AM  
**Sample Description** Sea Water  
**Location** ท่าเรือ TPI  
**Date Analysis Commenced** Mar 30, 2022  
**Condition of Sample** Contained in one plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
<b>Water Testing</b>						
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	2	<2	APHA (2017), 2540 D	Rayong

**Sampled By :** Narunat thammasaro

Remark :  
- LOD : Limit of Detection  
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Approved by

*N. Banchongkit*

Narumon Banchongkit  
Supervisor

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## Analysis / Test Report

**Client :** UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O :** 4500126042  
**Project Name :** Environmental Monitoring  
**Project Location :** Caprolactam Plant

**Lot ID: 2214674**  
Date Received : Mar 29, 2022  
Date Reported : Apr 01, 2022  
Report Number : 2220964-1

Page 2 of 12

**Sample Number** 2214674-2  
**Sampled Date** Mar 29, 2022 10:55 AM  
**Sample Description** Sea Water  
**Location** ท่าเรือ TPI  
**Date Analysis Commenced** Mar 30, 2022  
**Condition of Sample** Contained in one plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
<b>Water Testing</b>						
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	2	<2	APHA (2017), 2540 D	Rayong

**Sampled By :** Narunat thammasaro

Remark :  
- LOD : Limit of Detection  
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Approved by

*N. Banchongkit*

Narumon Banchongkit  
Supervisor

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## Analysis / Test Report

**Client** : UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O** : 4500126042  
**Project Name** : Environmental Monitoring  
**Project Location** : Caprolactam Plant

**Lot ID: 2214674**  
Date Received : Mar 29, 2022  
Date Reported : Apr 01, 2022  
Report Number : 2220964-1

Page 3 of 12

**Sample Number** : 2214674-3  
**Sampled Date** : Mar 29, 2022 12:45 PM  
**Sample Description** : Sea Water  
**Location** : ท่าเรือ TPI  
**Date Analysis Commenced** : Mar 30, 2022  
**Condition of Sample** : Contained in one plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
<b>Water Testing</b>						
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	2	<2	APHA (2017), 2540 D	Rayong

**Sampled By** : Narunat thammasaro

Remark :  
- LOD : Limit of Detection  
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

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Approved by

*N. Banphit*

Narumon Banchongkit  
Supervisor

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## Analysis / Test Report

**Client** : UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O** : 4500126042  
**Project Name** : Environmental Monitoring  
**Project Location** : Caprolactam Plant

**Lot ID: 2214674**  
Date Received : Mar 29, 2022  
Date Reported : Apr 01, 2022  
Report Number : 2220964-1

Page 4 of 12

**Sample Number** : 2214674-4  
**Sampled Date** : Mar 29, 2022 2:40 PM  
**Sample Description** : Sea Water  
**Location** : ท่าเรือ TPI  
**Date Analysis Commenced** : Mar 30, 2022  
**Condition of Sample** : Contained in one plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
<b>Water Testing</b>						
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	2	<2	APHA (2017), 2540 D	Rayong

**Sampled By** : Narunat thammasaro

Remark :  
- LOD : Limit of Detection  
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Approved by

*N. Banphit*

Narumon Banchongkit  
Supervisor

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## Analysis / Test Report

**Client :** UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O :** 4500126042  
**Project Name :** Environmental Monitoring  
**Project Location :** Caprolactam Plant

**Lot ID: 2214674**  
Date Received : Mar 29, 2022  
Date Reported : Apr 01, 2022  
Report Number : 2220964-1

Page 5 of 12

**Sample Number** 2214674-5  
**Sampled Date** Mar 29, 2022 4:45 PM  
**Sample Description** Sea Water  
**Location** ท่าเรือ TPI  
**Date Analysis Commenced** Mar 30, 2022  
**Condition of Sample** Contained in one plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
<b>Water Testing</b>						
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	2	<2	APHA (2017), 2540 D	Rayong

**Sampled By :** Narunat thammassaro

Remark :  
- LOD : Limit of Detection  
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Approved by

*N. Banchongkit*

Narumon Banchongkit  
Supervisor

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## Analysis / Test Report

**Client :** UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O :** 4500126042  
**Project Name :** Environmental Monitoring  
**Project Location :** Caprolactam Plant

**Lot ID: 2214674**  
Date Received : Mar 29, 2022  
Date Reported : Apr 01, 2022  
Report Number : 2220964-1

Page 6 of 12

**Sample Number** 2214674-6  
**Sampled Date** Mar 29, 2022 6:40 PM  
**Sample Description** Sea Water  
**Location** ท่าเรือ TPI  
**Date Analysis Commenced** Mar 30, 2022  
**Condition of Sample** Contained in one plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
<b>Water Testing</b>						
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	2	<2	APHA (2017), 2540 D	Rayong

**Sampled By :** Narunat thammassaro

Remark :  
- LOD : Limit of Detection  
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Approved by

*N. Banchongkit*

Narumon Banchongkit  
Supervisor

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**P/O :** 4500126042  
**Project Name :** Environmental Monitoring  
**Project Location :** Caprolactam Plant

**Lot ID: 2214674**  
**Date Received :** Mar 29, 2022  
**Date Reported :** Apr 01, 2022  
**Report Number :** 2220964-1

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**Sample Number** 2214674-7  
**Sampled Date** Mar 29, 2022 9:30 AM  
**Sample Description** Sea Water  
**Location** ทะเลเปิดจุดที่ 1  
**Date Analysis Commenced** Mar 30, 2022  
**Condition of Sample** Contained in one plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
<b>Water Testing</b>						
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	2	<2	APHA (2017), 2540 D	Rayong

**Sampled By :** Narunat thammasaro

Remark :  
- LOD : Limit of Detection  
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

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*N. Banchongkit*

Narumon Banchongkit  
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**P/O :** 4500126042  
**Project Name :** Environmental Monitoring  
**Project Location :** Caprolactam Plant

**Lot ID: 2214674**  
**Date Received :** Mar 29, 2022  
**Date Reported :** Apr 01, 2022  
**Report Number :** 2220964-1

Page 8 of 12

**Sample Number** 2214674-8  
**Sampled Date** Mar 29, 2022 11:30 AM  
**Sample Description** Sea Water  
**Location** ทะเลเปิดจุดที่ 1  
**Date Analysis Commenced** Mar 30, 2022  
**Condition of Sample** Contained in one plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
<b>Water Testing</b>						
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	2	<2	APHA (2017), 2540 D	Rayong

**Sampled By :** Narunat thammasaro

Remark :  
- LOD : Limit of Detection  
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Approved by

*N. Banchongkit*

Narumon Banchongkit  
Supervisor

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## Analysis / Test Report

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**P/O :** 4500126042  
**Project Name :** Environmental Monitoring  
**Project Location :** Caprolactam Plant

**Lot ID: 2214674**  
Date Received : Mar 29, 2022  
Date Reported : Apr 01, 2022  
Report Number : 2220964-1

Page 9 of 12

**Sample Number** 2214674-9  
**Sampled Date** Mar 29, 2022 1:30 PM  
**Sample Description** Sea Water  
**Location** ทะเลเปิดจุดที่ 1  
**Date Analysis Commenced** Mar 30, 2022  
**Condition of Sample** Contained in one plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
<b>Water Testing</b>						
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	2	<2	APHA (2017), 2540 D	Rayong

**Sampled By :** Narunat thammasaro

Remark :  
- LOD : Limit of Detection  
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

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*N. Banchongkit*

Narumon Banchongkit  
Supervisor

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**P/O :** 4500126042  
**Project Name :** Environmental Monitoring  
**Project Location :** Caprolactam Plant

**Lot ID: 2214674**  
Date Received : Mar 29, 2022  
Date Reported : Apr 01, 2022  
Report Number : 2220964-1

Page 10 of 12

**Sample Number** 2214674-10  
**Sampled Date** Mar 29, 2022 3:25 PM  
**Sample Description** Sea Water  
**Location** ทะเลเปิดจุดที่ 1  
**Date Analysis Commenced** Mar 30, 2022  
**Condition of Sample** Contained in one plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
<b>Water Testing</b>						
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	2	<2	APHA (2017), 2540 D	Rayong

**Sampled By :** Narunat thammasaro

Remark :  
- LOD : Limit of Detection  
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Approved by

*N. Banchongkit*

Narumon Banchongkit  
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**P/O** : 4500126042  
**Project Name** : Environmental Monitoring  
**Project Location** : Caprolactam Plant

**Lot ID: 2214674**  
Date Received : Mar 29, 2022  
Date Reported : Apr 01, 2022  
Report Number : 2220964-1

Page 11 of 12

**Sample Number** 2214674-11  
**Sampled Date** Mar 29, 2022 5:35 PM  
**Sample Description** Sea Water  
**Location** ทะเลเมืองจตุร 1  
**Date Analysis Commenced** Mar 30, 2022  
**Condition of Sample** Contained in one plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
<b>Water Testing</b>						
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	2	<2	APHA (2017), 2540 D	Rayong

**Sampled By** : Narunat thammassaro

Remark :  
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*N. Banmit*

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## Analysis / Test Report

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**P/O** : 4500126042  
**Project Name** : Environmental Monitoring  
**Project Location** : Caprolactam Plant

**Lot ID: 2214674**  
Date Received : Mar 29, 2022  
Date Reported : Apr 01, 2022  
Report Number : 2220964-1

Page 12 of 12

**Sample Number** 2214674-12  
**Sampled Date** Mar 29, 2022 6:15 PM  
**Sample Description** Sea Water  
**Location** ทะเลเมืองจตุร 1  
**Date Analysis Commenced** Mar 30, 2022  
**Condition of Sample** Contained in one plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Method	Testing Location
<b>Water Testing</b>						
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	2	<2	APHA (2017), 2540 D	Rayong

**Sampled By** : Narunat thammassaro

Remark :  
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*N. Banmit*

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## Analysis / Test Report

**Client :** UBE Chemicals (Asia) Public Company Limited  
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**P/O :** 4500126042  
**Project Name :** Environmental Monitoring  
**Project Location :** Caprolactam Plant

**Lot ID: 2214570**  
Date Received : Mar 29, 2022  
Date Reported : Jul 07, 2022  
Report Number : 2220898-1 Rev. No.1

Page 1 of 5

<b>Sample Number</b>	2214570-1
<b>Sampled Date</b>	Mar 29, 2022 10:55 AM
<b>Sample Description</b>	Sea Water
<b>Location</b>	หน้า TPI
<b>Date Analysis Commenced</b>	Mar 29, 2022
<b>Condition of Sample</b>	Contained in two glass vials, one amber glass bottle, six plastic bottles and one BOD bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Metals Testing</b>							
Aluminium	mg/L	0.03	0.10	Not Detected	No Standard	Based on APHA (2017), 3125	Bangkok
Mercury	mg/L	0.000003	0.00005	<0.00005	≤0.0001	Based on US EPA, Method 1631 Revision E	Bangkok
<b>Microbiological Testing</b>							
Total Coliform	MPN/100mL	-	-	<1.8	≤1000	APHA (2017), 9221 B	Bangkok
<b>Water Testing</b>							
Ammonia Nitrogen	mg/L	0.02	0.05	Not Detected	≤0.95	Based on APHA (2017), 4500-NH <sub>3</sub> F	Rayong
BOD (5 days at 20 Degree C)	mg/L	-	2	<2	No Standard	APHA (2017), 5210 B	Rayong
COD	mg/L	1.5	5	47	No Standard	APHA (2017), 5220 C	Rayong
Depth	m	-	-	11.50	No Standard	Water Level Meter	Bangkok
Dissolved Oxygen	mg/L	-	0.1	5.7	>4	Based on APHA (2017), 4500-O(C)	Rayong
Flow rate	m <sup>3</sup> /h	-	-	29602	No Standard	Flow meter	Rayong
Oil & Grease	mg/L	-	3	<3	No Standard	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C	-	-	-	8.3	7.0-8.5	Based on APHA (2017), 4500-H (B)	Rayong
Phosphate as P	mg/L	0.002	0.005	Not Detected	≤0.045	Based on APHA (2017), 4500-P(E)	Rayong
Salinity	ppt	-	0.1	30.9	Change from lower salinity not more than 10%	Based on APHA (2017), 2520 B	Rayong
Temperature	Degree C	-	-	30.2	Change from natural condition not more than 2 degree C	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	35200	No Standard	APHA (2017), 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	2	<2	No Standard	APHA (2017), 2540 D	Rayong

Approved by

*Chanatt L.*

Chanattagam Inchom  
Supervisor

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## Analysis / Test Report

**Client :** UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O :** 4500126042  
**Project Name :** Environmental Monitoring  
**Project Location :** Caprolactam Plant

**Lot ID: 2214570**  
Date Received : Mar 29, 2022  
Date Reported : Jul 07, 2022  
Report Number : 2220898-1 Rev. No.1

Page 2 of 5

<b>Sample Number</b>	2214570-1
<b>Sampled Date</b>	Mar 29, 2022 10:55 AM
<b>Sample Description</b>	Sea Water
<b>Location</b>	หน้า TPI
<b>Date Analysis Commenced</b>	Mar 29, 2022
<b>Condition of Sample</b>	Contained in two glass vials, one amber glass bottle, six plastic bottles and one BOD bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
Transparency	m	-	-	5.1	Change from Natural condition not more than 10% of the lowest transparency	NIOSH (1994)	Rayong
Turbidity	NTU	-	0.1	0.9	No Standard	Based on APHA (2017), 2130 B	Rayong

**Guideline :** Notification of the National Environmental Board, B.E.2564 : Coastal Water Quality Standard (Class 5)

**Note :** Velocity = 2.6174 m/s  
This Analysis test report is reissued to supersede report No.2220898-1, Date Reported : Apr 05, 2022 due to revise analytical information.

**Sampled By :** Narunat thammassaro

Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Approved by

*Chanatt L.*

Chanattagam Inchom  
Supervisor

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Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
P/O : 4500126042  
Project Name : Environmental Monitoring  
Project Location : Caproctam Plant  
Sample Number 2214570-2  
Sample Date Mar 29, 2022 11:30 AM  
Sample Description Sea Water  
Location mualdaeng 1  
Date Analysis Commenced Mar 29, 2022  
Condition of Sample Contained in two glass vials, one amber glass bottle, six plastic bottles and one BOD bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Aluminum	mg/L	0.03	0.10	Not Detected	No Standard	Based on APHA (2017), 3125	Bangkok
Mercury	mg/L	0.000003	0.00005	<0.00005	≤0.0001	Based on US EPA, Method 1631 Revision E	Bangkok
Microbiological Testing							
Total Coliform	MPN/100mL	-	-	<1.8	≤1000	APHA (2017), 9221 B	Bangkok
Water Testing							
Ammonia Nitrogen	mg/L	0.02	0.05	Not Detected	≤0.95	Based on APHA (2017), 4500-NH3	Rayong
BOD (5 days at 20 Degree C)	mg/L	-	2	<2	No Standard	APHA (2017), 5210 B	Rayong
COD	mg/L	1.5	5	51	No Standard	APHA (2017), 5220 C	Rayong
Depth	m	-	-	-	No Standard	Water Level Meter	Bangkok
Dissolved Oxygen	mg/L	-	0.1	6.0	>4	Based on APHA (2017), 4500-O(C)	Rayong
Flow rate	m3/h	-	-	13120	No Standard	Flow meter	Rayong
Oil & Grease	mg/L	-	3	<3	No Standard	Based on APHA (2017), 5520 B	Rayong
pH at 25 degree C	-	-	-	8.3	7.0-8.5	Based on APHA (2017), 4500-H (B)	Rayong
Phosphate as P	mg/L	0.002	0.005	Not Detected	≤0.045	Based on APHA (2017), 4500-P(E)	Rayong
Salinity	ppt	-	0.1	30.6	Change from lower salinity not more than 10%	Based on APHA (2017), 2520 B	Rayong
Temperature	Degree C	-	-	30.7	Change from natural condition not more than 2 degree C	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	34100	No Standard	APHA (2017), 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	2	<2	No Standard	APHA (2017), 2540 D	Rayong

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Chanatagarn Jimchon  
Supervisor

Approved by

Chanatagarn Jimchon



Analysis / Test Report

Client : UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
P/O : 4500126042  
Project Name : Environmental Monitoring  
Project Location : Caproctam Plant  
Sample Number 2214570-2  
Sample Date Mar 29, 2022 11:30 AM  
Sample Description Sea Water  
Location mualdaeng 1  
Date Analysis Commenced Mar 29, 2022  
Condition of Sample Contained in two glass vials, one amber glass bottle, six plastic bottles and one BOD bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Transparency	m	-	-	5.2	Natural condition not more than 10% of the lowest transparency	NIOSH (1994)	Rayong
Turbidity	NTU	0.1	1.0	-	No Standard	Based on APHA (2017), 2130 B	Rayong
Water Testing							
Guideline : Notification of the National Environmental Board, B.E.2564 : Coastal Water Quality Standard (Class 5)							
Note : Velocity = 1.4500 m/s							
This Analysis test report is reissued to supersede report No.2220898-1, Date Reported : Apr 05, 2022 due to revise analytical information.							
Sampled By : Narueth Thammamasaro							
Remark : LOD : Limit of Detection - " < " : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)							

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Approved by

Chanatagarn Jimchon  
Supervisor

Chanatagarn Jimchon



## Analysis / Test Report

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 140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O :** 4500126042  
**Project Name :** Environmental Monitoring  
**Project Location :** Caprolactam Plant

**Lot ID: 2214570**  
**Date Received :** Mar 29, 2022  
**Date Reported :** Jul 07, 2022  
**Report Number :** 2220898-1 Rev. No.1

Page 5 of 5

**Sample Number** 2214570-3  
**Sampled Date** Mar 29, 2022 8:30 AM  
**Sample Description** Sea Water  
**Location** จตุรัส  
**Date Analysis Commenced** Mar 29, 2022  
**Condition of Sample** Contained in two glass vials, one amber glass bottle, six plastic bottles and one BOD bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
Flow rate	m <sup>3</sup> /h	-	-	18430	No Standard	Flow meter	Rayong
Temperature	Degree C	-	-	31.1	Change from natural condition not more than 2 degree C	Based on APHA (2017), 2550 B	Rayong

**Guideline :** Notification of the National Environmental Board, B.E.2564 : Coastal Water Quality Standard (Class 5)

**Note :** Velocity = 2.0369 m/s  
 This Analysis test report is reissued to supersede report No.2220898-1, Date Reported : Apr 05, 2022 due to revise analytical information.  
**Sampled By :** Narunat thamasaro

**Remark :**  
 - LOD : Limit of Detection  
 - "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Approved by

*Chanatt L.*

Chanattagam Imchom  
 Supervisor

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## ภาคผนวก ง.6

### ใบรับรองผลการวิเคราะห์คุณภาพน้ำใต้ดิน



## Analysis / Test Report

**Client :** UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O :** 4500126042  
**Project Name :** Environmental Monitoring  
**Project Location:** Caprolactam Plant

**Lot ID: 2214671**  
Date Received : Mar 30, 2022  
Date Reported : Apr 05, 2022  
Report Number : 2279267-1

Page 1 of 1

<b>Sample Number</b>	2214671-1
<b>Sampled Date</b>	Mar 30, 2022 11:02 AM
<b>Sample Description</b>	Groundwater
<b>Location</b>	บ่อน้ำดินที่บ่านปลวกเกตุ
<b>Date Analysis Commenced</b>	Mar 31, 2022
<b>Condition of Sample</b>	Contained in two glass vials and five plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
pH at 25 degree C		-	-	6.6	6.5-9.2 (I)	Based on APHA (2017), 4500-H (B)	Rayong

**Guideline :** Notification of the Ministry of Industry B.E. 2559 (2016) on Soil and Groundwater Contamination Criteria, Monitoring of Soil and Groundwater Quality, Report Submission and Report Preparation of Soil and Groundwater Quality, and Proposal Report of Soil and Groundwater Controlling and Reduction Measures

(I): ในกรณีที่มีการปนเปื้อนของกรรณหรือต่างไม่เปรียบเทียบกับผลวิเคราะห์ค่าที่เอชจากจุดเก็บตัวอย่างบ่อน้ำที่ใดในการติดตามตรวจสอบการปนเปื้อนกับผลวิเคราะห์จากจุดเก็บตัวอย่างบ่อน้ำที่ใดเป็นบ่อน้ำที่ใดทางทิศทางการไหลของน้ำใต้ดินในพื้นที่ โดยค่าที่เอชที่เปลี่ยนแปลงจะต้องไม่เกินหนึ่งระดับ และไม้อุ่นอกช่วงค่าเกณฑ์ของมาตรฐานคุณภาพน้ำบาดาลที่ในบริเวณคือ 6.5-9.2

**Sampled By :** Narunat thammasaro , Panupong Manit

Remark :  
- LOD : Limit of Detection  
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Technical Management

*N. Banphit*

Narumon Banchongkit  
Supervisor

ทะเบียนเลขที่ ๖-323-๖-9445

Approved by

*D. Changchon*

Dej Changchon  
Senior Manager

ทะเบียนเลขที่ ๖-323-๖-9442

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## Analysis / Test Report

**Client :** UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O :** 4500126042  
**Project Name :** Environmental Monitoring  
**Project Location:** Caprolactam Plant

**Lot ID: 2214671**  
Date Received : Mar 30, 2022  
Date Reported : Apr 06, 2022  
Report Number : 2279267-2

Page 1 of 1

<b>Sample Number</b>	2214671-1
<b>Sampled Date</b>	Mar 30, 2022 11:02 AM
<b>Sample Description</b>	Groundwater
<b>Location</b>	บ่อน้ำดินที่บ่านปลวกเกตุ
<b>Date Analysis Commenced</b>	Mar 30, 2022
<b>Condition of Sample</b>	Contained in two glass vials and five plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Metals Testing</b>							
Aluminium	mg/L	0.003	0.005	0.08	No Standard	Based on APHA (2017), 3125	Bangkok
Iron	mg/L	0.003	0.005	0.75	No Standard	Based on APHA (2017), 3125	Bangkok
<b>Microbiological Testing</b>							
Total Coliform	MPN/100mL	-	-	2.0	No Standard	APHA (2017), 9221 B	Bangkok
<b>Water Testing</b>							
Chloride as Cl *	mg/L	0.06	0.2	45.1	No Standard	APHA (2017), 4110 B	Bangkok
Nitrate as N	mg/L	0.06	0.2	0.5	No Standard	APHA (2017), 4110 B	Bangkok
Temperature *	Degree C	-	-	29.2	No Standard	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C *	mg/L	-	5	280	No Standard	APHA (2017), 2540 C	Rayong
Total Hardness as CaCO3 *	mg/L	-	1	134	No Standard	Based on APHA (2017), 2340 C	Rayong
Total Suspended Solids Dried at 103-105 degree C *	mg/L	-	5	5	No Standard	APHA (2017), 2540 D	Rayong

**Guideline :** Notification of the Ministry of Industry B.E. 2559 (2016) on Soil and Groundwater Contamination Criteria, Monitoring of Soil and Groundwater Quality, Report Submission and Report Preparation of Soil and Groundwater Quality, and Proposal Report of Soil and Groundwater Controlling and Reduction Measures

**Sampled By :** Narunat thammasaro , Panupong Manit

Remark :  
- LOD : Limit of Detection  
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)  
- Analyte(s) marked \* is/are not included in scope of Accreditation ISO/IEC 17025.

Approved by

*Sithichok T.*

Sithichok Thongnguen  
Scientist (3)

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## Analysis / Test Report

**Client :** UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O :** 4500126042  
**Project Name :** Environmental Monitoring  
**Project Location :** Caprolactam Plant

**Lot ID: 2214671**  
Date Received : Mar 30, 2022  
Date Reported : Apr 06, 2022  
Report Number : 2279267-3

Page 1 of 1

**Sample Number** 2214671-1  
**Sampled Date** Mar 30, 2022 11:02 AM  
**Sample Description** Groundwater  
**Location** บ่อน้ำดื่มที่บ้านพลวงเกตุ  
**Date Analysis Commenced** Mar 31, 2022  
**Condition of Sample** Contained in two glass vials and five plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Metals Testing</b>							
Mercury	mg/L	0.0001	0.0005	Not Detected	0.7	Based on APHA (2017), 3112	Bangkok

**Guideline :** Notification of the Ministry of Industry B.E. 2559 (2016) on Soil and Groundwater Contamination Criteria, Monitoring of Soil and Groundwater Quality, Report Submission and Report Preparation of Soil and Groundwater Quality, and Proposal Report of Soil and Groundwater Controlling and Reduction Measures

**Sampled By :** Narunat thammassaro , Panupong Manit

**Remark :**  
- LOD : Limit of Detection  
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Technical Management

*Savitree N.*  
Savitree Naisangiam  
Assistant Manager  
ทะเบียนเลขที่ 7-204-จ-4709

Approved by

*Kanokkorn Anek*  
Kanokkorn Anek  
Senior Manager  
ทะเบียนเลขที่ 7-204-ค-6111

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## Analysis / Test Report

**Client :** UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000  
**P/O :** 4500126042  
**Project Name :** Environmental Monitoring  
**Project Location :** Caprolactam Plant

**Lot ID: 2214671**  
Date Received : Mar 30, 2022  
Date Reported : Apr 05, 2022  
Report Number : 2279268-1

Page 1 of 1

**Sample Number** 2214671-2  
**Sampled Date** Mar 30, 2022 1:21 PM  
**Sample Description** Groundwater  
**Location** บ่อน้ำดื่มที่บ้านหน้าพัน 7  
**Date Analysis Commenced** Mar 31, 2022  
**Condition of Sample** Contained in two glass vials and five plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
pH at 25 degree C		-	-	7.0	6.5-9.2 (I)	Based on APHA (2017), 4500-H (B)	Rayong

**Guideline :** Notification of the Ministry of Industry B.E. 2559 (2016) on Soil and Groundwater Contamination Criteria, Monitoring of Soil and Groundwater Quality, Report Submission and Report Preparation of Soil and Groundwater Quality, and Proposal Report of Soil and Groundwater Controlling and Reduction Measures

(I): ในกรณีที่มีการปนเปื้อนของกรดหรือด่างไม่พร้อมเพี้ยนผลวิเคราะห์ค่าที่เฝ้าระวังจากจุดเก็บตัวอย่างบ่อน้ำดื่มที่บ้านหน้าพัน 7 ซึ่งในการติดตามตรวจสอบการปนเปื้อนกับผลวิเคราะห์จากจุดเก็บตัวอย่างบ่อน้ำดื่มที่บ้านหน้าพัน 7 ซึ่งเป็นการเฝ้าระวังคุณภาพน้ำดื่มของน้ำใต้ดินในพื้นที่ โดยค่าที่เฝ้าระวังเปลี่ยนแปลงจะต้องไม่เกินหนึ่งระดับ และไม่อยู่นอกช่วงค่าเกณฑ์ของค่าสูงสุดของมาตรฐานคุณภาพน้ำบาดาลที่ในบริเวณคือ 6.5-9.2

**Sampled By :** Narunat thammassaro , Panupong Manit

**Remark :**  
- LOD : Limit of Detection  
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Technical Management

*N. Banchongkit*  
Narumon Banchongkit  
Supervisor  
ทะเบียนเลขที่ 7-323-จ-9445

Approved by

*Dej Changchon*  
Dej Changchon  
Senior Manager  
ทะเบียนเลขที่ 7-323-ค-9442

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## Analysis / Test Report

**Client** : UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000

**P/O** : 4500126042

**Project Name** : Environmental Monitoring

**Project Location**: Caprolactam Plant



**TESTING**  
No.0009

**Lot ID: 2214671**

Date Received : Mar 30, 2022

Date Reported : Apr 06, 2022

Report Number : 2279268-2

Page 1 of 1

<b>Sample Number</b>	2214671-2						
<b>Sampled Date</b>	Mar 30, 2022 1:21 PM						
<b>Sample Description</b>	Groundwater						
<b>Location</b>	บ่อน้ำดื่มที่บ้านหน้าพัน ร.7						
<b>Date Analysis Commenced</b>	Mar 30, 2022						
<b>Condition of Sample</b>	Contained in two glass vials and five plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Metals Testing</b>							
Aluminium	mg/L	0.003	0.005	0.43	No Standard	Based on APHA (2017), 3125	Bangkok
Iron	mg/L	0.003	0.005	12.6	No Standard	Based on APHA (2017), 3125	Bangkok
<b>Microbiological Testing</b>							
Total Coliform	MPN/100mL	-	-	4.5	No Standard	APHA (2017), 9221 B	Bangkok
<b>Water Testing</b>							
Chloride as Cl *	mg/L	0.06	0.2	58.4	No Standard	APHA (2017), 4110 B	Bangkok
Nitrate as N	mg/L	0.06	0.2	Not Detected	No Standard	APHA (2017), 4110 B	Bangkok
Temperature *	Degree C	-	-	30.2	No Standard	Based on APHA (2017), 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C *	mg/L	-	5	336	No Standard	APHA (2017), 2540 C	Rayong
Total Hardness as CaCO <sub>3</sub> *	mg/L	-	1	228	No Standard	Based on APHA (2017), 2340 C	Rayong
Total Suspended Solids Dried at 103-105 degree C *	mg/L	-	5	33	No Standard	APHA (2017), 2540 D	Rayong

**Guideline** : Notification of the Ministry of Industry B.E. 2559 (2016) on Soil and Groundwater Contamination Criteria, Monitoring of Soil and Groundwater Quality, Report Submission and Report Preparation of Soil and Groundwater Quality, and Proposal Report of Soil and Groundwater Controlling and Reduction Measures

**Sampled By** : Narunat thammasaro , Panupong Manit

Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked \* is/are not included in scope of Accreditation ISO/IEC 17025.

Approved by

*Sithichok T.*

Sithichok Thongnguen  
Scientist (3)

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## Analysis / Test Report

**Client** : UBE Chemicals (Asia) Public Company Limited  
140/6 Moo 4, Tambol Tapong, Amphur Muang, Rayong Thailand 21000

**P/O** : 4500126042

**Project Name** : Environmental Monitoring

**Project Location**: Caprolactam Plant

**Lot ID: 2214671**

Date Received : Mar 30, 2022

Date Reported : Apr 06, 2022

Report Number : 2279268-3

Page 1 of 1

<b>Sample Number</b>	2214671-2						
<b>Sampled Date</b>	Mar 30, 2022 1:21 PM						
<b>Sample Description</b>	Groundwater						
<b>Location</b>	บ่อน้ำดื่มที่บ้านหน้าพัน ร.7						
<b>Date Analysis Commenced</b>	Mar 31, 2022						
<b>Condition of Sample</b>	Contained in two glass vials and five plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Metals Testing</b>							
Mercury	mg/L	0.0001	0.0005	Not Detected	0.7	Based on APHA (2017), 3112	Bangkok

**Guideline** : Notification of the Ministry of Industry B.E. 2559 (2016) on Soil and Groundwater Contamination Criteria, Monitoring of Soil and Groundwater Quality, Report Submission and Report Preparation of Soil and Groundwater Quality, and Proposal Report of Soil and Groundwater Controlling and Reduction Measures

**Sampled By** : Narunat thammasaro , Panupong Manit

Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Technical Management

*Sawitree N.*

Sawitree Naisangiam  
Assistant Manager

ทะเบียนเลขที่ ว-204-จ-4709

Approved by

*Kanokkorn Anek*

Kanokkorn Anek  
Senior Manager

ทะเบียนเลขที่ ว-204-ค-6111

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## ภาคผนวก ง.7

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ใบรับรองผลการวิเคราะห์คุณภาพสิ่งแวดล้อม  
ด้านนิเวศวิทยาและการประมง



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

Client : UBE Chemicals (Asia) Public Company Limited

Address : 140/6 Moo 4 Tambol Tapong , Amphur Muang , Rayong , Thailand , 21000

Project Name : Environmental Monitoring

Project Location : Caprolactam Plant

รายงานผลการวิเคราะห์แพลงก์ตอนพืช

ตาราง ผลการวิเคราะห์แพลงก์ตอนพืช (เก็บตัวอย่างวันที่ 29 มีนาคม 2565)

ชนิดแพลงก์ตอนพืช	ปริมาณแพลงก์ตอนพืช (หน่วยต่อลูกบาศก์เมตร)	
	2214669-1	2214669-2
<b>Division Cyanophyta</b>		
<b>Class Cyanophyceae</b>		
<b>Order Nostocales</b>		
<b>Family Oscillatoriaceae</b>		
1. <i>Oscillatoria tenuis</i>	2,573,000	1,896,000
<b>Family Nostocaceae</b>		
2. <i>Pseudanabaena</i> sp.	98,000	123,000
<b>Division Chromophyta</b>		
<b>Class Bacillariophyceae</b>		
<b>Order Biddulphiales</b>		
<b>Suborder Coscinodiscineae</b>		
<b>Family Thalassiosiraceae</b>		
3. <i>Cyclotella striata</i>	135,000	212,000
4. <i>Lauderia annulata</i>	392,000	89,000

ตาราง ผลการวิเคราะห์แพลงก์ตอนพืช (เก็บตัวอย่างวันที่ 29 มีนาคม 2565)

(ต่อ)

ชนิดแพลงก์ตอนพืช	ปริมาณแพลงก์ตอนพืช (หน่วยต่อลูกบาศก์เมตร)	
	2214669-1	2214669-2
5. <i>Skeletonema costatum</i>	441,000	-
<b>Family Leptocyliodraceae</b>		
6. <i>Corethron criophilum</i>	98,000	-
<b>Family Coscinodiscaceae</b>		
7. <i>Coscinodiscus</i> sp.	86,000	-
<b>Family Asterolampraceae</b>		
8. <i>Asteromphalus flabellatus</i>	25,000	-
<b>Family Hemidiscaceae</b>		
<b>Suborder Rhizosoleniineae</b>		
<b>Family Rhizosoleniaceae</b>		
9. <i>Dactyliosolen antarcticus</i>	-	22,000
10. <i>Dactyliosolen fragillissima</i>	294,000	401,000
11. <i>Guinardia delicatula</i>	2,940,000	1,450,000
12. <i>Guinardia flaccida</i>	490,000	268,000
13. <i>Guinardia striata</i>	184,000	123,000
14. <i>Proboscia alata</i>	2,450,000	914,000
15. <i>Pseudosolenia calcar</i>	172,000	-
16. <i>Rhizosolenia acuminata</i>	74,000	212,000
17. <i>Rhizosolenia formosa</i>	123,000	-
18. <i>Rhizosolenia imbricata</i>	-	11,000
19. <i>Rhizosolenia setigera</i>	37,000	-
<b>Suborder Biddulphiineae</b>		
<b>Family Hemiaulaceae</b>		
20. <i>Cerataulina bicornis</i>	37,000	67,000
21. <i>Cerataulina pelagica</i>	429,000	-
22. <i>Climacodium frauenfeldianum</i>	-	22,000
23. <i>Hemiaulus hauckii</i>	49,000	-

ตาราง ผลการวิเคราะห์แพลงก์ตอนพืช (เก็บตัวอย่างวันที่ 29 มีนาคม 2565)

(ต่อ)

ชนิดแพลงก์ตอนพืช	ปริมาณแพลงก์ตอนพืช (หน่วยต่อลูกบาศก์เมตร)	
	2214669-1	2214669-2
24. <i>Hemiaulus indicus</i>	86,000	-
<b>Family Chaetoceraceae</b>		
25. <i>Bacteriastrum comosum</i>	147,000	-
26. <i>Bacteriastrum delicatulum</i>	72,000	-
27. <i>Bacteriastrum furcatum</i>	123,000	33,000
28. <i>Bacteriastrum</i> sp.	-	33,000
29. <i>Chaetoceros affinis</i>	49,000	-
30. <i>Chaetoceros coarctatus</i>	25,000	-
31. <i>Chaetoceros compressus</i>	1,348,000	123,000
32. <i>Chaetoceros contortus</i>	46,918,000	29,659,000
33. <i>Chaetoceros costatus</i>	86,000	-
34. <i>Chaetoceros curvisetus</i>	6,615,000	892,000
35. <i>Chaetoceros didymus</i>	343,000	22,000
36. <i>Chaetoceros diversus</i>	196,000	56,000
37. <i>Chaetoceros laciniosus</i>	539,000	-
38. <i>Chaetoceros lorenzianus</i>	360,000	56,000
39. <i>Chaetoceros mitra</i>	196,000	134,000
40. <i>Chaetoceros peruvianus</i>	245,000	78,000
41. <i>Chaetoceros pseudocurvisetus</i>	1,225,000	357,000
42. <i>Chaetoceros radicans</i>	-	234,000
43. <i>Chaetoceros rostratus</i>	208,000	45,000
44. <i>Chaetoceros</i> sp.	429,000	1,227,000
<b>Family Lithodesmaceae</b>		
45. <i>Ditylum sol</i>	12,000	-

ตาราง ผลการวิเคราะห์แพลงก์ตอนพืช (เก็บตัวอย่างวันที่ 29 มีนาคม 2565)

(ต่อ)

ชนิดแพลงก์ตอนพืช	ปริมาณแพลงก์ตอนพืช (หน่วยต่อลูกบาศก์เมตร)	
	2214669-1	2214669-2
<b>Order Bacillariales</b>		
<b>Suborder Fragilariineae</b>		
<b>Family Thalassionemataceae</b>		
46. <i>Thalassionema frauenfeldii</i>	331,000	33,000
47. <i>Thalassionema nitzschioides</i>	735,000	78,000
<b>Suborder Bacillariineae</b>		
<b>Family Naviculaceae</b>		
48. <i>Amphora exgua</i>	-	11,000
49. <i>Amphora robusta</i>	221,000	112,000
50. <i>Haslea tromphii</i>	12,000	-
51. <i>Haslea wawriake</i>	-	22,000
52. <i>Pleurosigma angulatum</i>	49,000	11,000
53. <i>Pleurosigma elongatum</i>	-	22,000
54. <i>Pleurosigma narmanii</i>	-	11,000
55. <i>Trachyneis</i> sp.	25,000	45,000
<b>Family Bacillariaceae</b>		
56. <i>Nitzschia lorenziana</i>	-	11,000
57. <i>Pseudo-nitzschia heimii</i>	98,000	201,000
58. <i>Pseudo-nitzschia</i> sp.	588,000	781,000
<b>Class Dinophyceae</b>		
<b>Order Gymnodiniales</b>		
<b>Family Gymnodiniaceae</b>		
59. <i>Gymnodinium</i> sp.	-	11,000
<b>Order Gonyaulacalea</b>		
<b>Family Ceratiaceae</b>		
60. <i>Ceratium boehmii</i>	-	11,000
61. <i>Ceratium deflexum</i>	12,000	-

**ตาราง ผลการวิเคราะห์แพลงก์ตอนพืช** (เก็บตัวอย่างวันที่ 29 มีนาคม 2565)

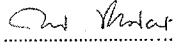
(ต่อ)

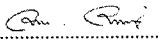
ชนิดแพลงก์ตอนพืช	ปริมาณแพลงก์ตอนพืช (หน่วยต่อลูกบาศก์เมตร)	
	2214669-1	2214669-2
62. <i>Ceratium furca</i>	86,000	134,000
63. <i>Ceratium trichoceros</i>	12,000	11,000
<b>Family Gonyaulaceae</b>		
64. <i>Gonyaulax turbynei</i>	61,000	-
<b>Order Peridinales</b>		
<b>Family Peridiniaceae</b>		
65. <i>Peridinium gatunense</i>	-	89,000
<b>Family Protoperidiniaceae</b>		
66. <i>Prorocentrum mexicanum</i>	37,000	45,000
67. <i>Prorocentrum micans</i>	110,000	223,000
68. <i>Prorocentrum sigmoides</i>	25,000	-
69. <i>Protoperidinium angustum</i>	-	78,000
70. <i>Protoperidinium cornicum</i>	-	22,000
71. <i>Protoperidinium curtipes</i>	-	11,000
72. <i>Protoperidinium latispinum</i>	25,000	-
73. <i>Protoperidinium pellucidum</i>	37,000	11,000
74. <i>Protoperidinium</i> sp.	98,000	45,000
<b>ชนิดแพลงก์ตอนพืช</b>	<b>58</b>	<b>52</b>
<b>ปริมาณแพลงก์ตอนพืช</b>	<b>72,911,000</b>	<b>40,788,000</b>
<b>ดัชนีความหลากหลายแพลงก์ตอนพืช</b>	<b>1.6848</b>	<b>1.3931</b>
<b>ดัชนีความสม่ำเสมอแพลงก์ตอนพืช</b>	<b>0.4149</b>	<b>0.3526</b>

**Sample Location :**

1. สถานี 2214669-1 : ท่าเรือ TPI
2. สถานี 2214669-2 : ทะเลเปิดจุดที่ 1

**Condition of Sample :** contained in one plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

  
 (นางสาวกนกวรรณ ขาวค่อน)  
 ผู้วิเคราะห์

  
 (นายอลงกต อินทรชาติ)  
 หัวหน้าสถานีวิจัยประมงศรีราชา



สถานีวิจัยประมงศรีราชา

101/12 หมู่ 9 ต. บางพระ

อ. ศรีราชา จ. ชลบุรี 20110

โทร./โทรสาร. (038) 311379

Client : UBE Chemicals (Asia) Public Company Limited

Address : 140/6 Moo 4 Tambol Tapong , Amphur Muang , Rayong , Thailand , 21000

Project Name : Environmental Monitoring

Project Location : Caprolactam Plant

#### รายงานผลการวิเคราะห์แพลงก์ตอนสัตว์

ตาราง ผลการวิเคราะห์แพลงก์ตอนสัตว์ (เก็บตัวอย่างวันที่ 29 มีนาคม 2565)

ชนิดแพลงก์ตอนสัตว์	ปริมาณแพลงก์ตอนสัตว์ (หน่วยต่อลูกบาศก์เมตร)	
	2214669-1	2214669-2
Phylum Protozoa		
Subphylum Ciliophora		
Class Ciliata		
Subclass Spirotricha		
Order Tintinnida		
Family Codonellidae		
1. <i>Tintinnopsis beroidea</i>	-	11,000
Family Codonellopsidae		
2. <i>Stenosemella nivalis</i>	12,000	-
Family Coxiellidae		
3. <i>Helicostomella fusiformis</i>	-	22,000
Family Cyttarocylidae		
4. <i>Favella panamensis</i>	-	11,000

ตาราง ผลการวิเคราะห์แพลงก์ตอนสัตว์ (เก็บตัวอย่างวันที่ 29 มีนาคม 2565)

(ต่อ)

ชนิดแพลงก์ตอนสัตว์	ปริมาณแพลงก์ตอนสัตว์ (หน่วยต่อลูกบาศก์เมตร)	
	2214669-1	2214669-2
Family Petalotrichidae		
5. <i>Metacylis pithos</i>	12,000	78,000
Family Tintinnidae		
6. <i>Eutintinnus</i> sp.	12,000	-
Phylum Arthropoda		
Class Crustacea		
Subclass Copepoda		
7. Copepod nauplii	123,000	100,000
Order Cyclopoida		
8. Cyclopoid copepod	25,000	11,000
Order Harpacticoida		
9. Harpacticoid copepod	-	11,000
Phylum Chordata		
Subphylum Urochordata		
Class Larvacea		
Family Oikopleuridae		
10. <i>Oikopleura</i> sp.	-	22,000
ชนิดแพลงก์ตอนสัตว์	5	8
ปริมาณแพลงก์ตอนสัตว์	184,000	266,000
ดัชนีความหลากหลายแพลงก์ตอนสัตว์	1.0746	1.6668
ดัชนีความสม่ำเสมอแพลงก์ตอนสัตว์	0.6677	0.8016

Sample Location : 1. สถานี 2214669-1 : ท่าเรือ TPI  
2. สถานี 2214669-2 : ทะเลเปิดจุดที่ 1

Condition of Sample : contained in one plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

(นางสาวกนกวรรณ ขวาค่อน)

ผู้วิเคราะห์

(นายอลงกต อินทรชาติ)

หัวหน้าสถานีวิจัยประมงศรีราชา



สถานีวิจัยประมงศรีราชา

101/12 หมู่ 9 ต. บางพระ

อ. ศรีราชา จ. ชลบุรี 20110

โทร./โทรสาร. (038) 311379

Client : UBE Chemicals (Asia) Public Company Limited

Address : 140/6 Moo 4 Tambol Tapong , Amphur Muang , Rayong , Thailand , 21000

Project Name : Environmental Monitoring

Project Location : Caprolactam Plant

#### รายงานผลการวิเคราะห์สัตว์หน้าดิน

ตาราง ผลการวิเคราะห์สัตว์หน้าดิน (เก็บตัวอย่างวันที่ 29 มีนาคม 2565)

ชนิดสัตว์หน้าดิน	ปริมาณสัตว์หน้าดิน (ตัว/ตารางเมตร)	
	2214593-1	2214593-2
Phylum Annelida		
Class Polychaeta		
Order Opheliida		
Family Opheliidae		
<i>Ophelina</i> sp. (ไส้เดือนทะเล)	15	-
Order Phyllodocida		
Family Glyceridae		
<i>Glycera</i> sp. (ไส้เดือนทะเล)	-	30
Family Nereididae		
<i>Nereis</i> sp. (ไส้เดือนทะเล)	-	15
Phylum Arthropoda		
Class Malacostraca		
Order Amphipoda		
Family Ampeliscidae		
<i>Ampelisca</i> sp. (แอมพีพอด)	-	15

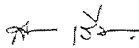



ตาราง ผลการวิเคราะห์สัตว์หน้าดิน (เก็บตัวอย่างวันที่ 29 มีนาคม 2565) (ต่อ)

ชนิดสัตว์หน้าดิน	ปริมาณสัตว์หน้าดิน (ตัว/ตารางเมตร)	
	2214593-1	2214593-2
Phylum Mollusca Class Bivalvia Order Cardiida Family Cardiidae <i>Ctenocardia</i> sp. (หอยสองฝาชนิดหนึ่ง)	15	-
Phylum Echinodermata Class Echinoidea Order Camarodonta Family Temnopleuridae <i>Temnopleurus</i> sp. (เม่นทะเล)	15	-
Class Holothuroidea Order Holothuriida Family Holothuriidae <i>Holothuria</i> sp. (ปลิงทะเล)	-	15
ชนิดสัตว์หน้าดิน	3	4
ปริมาณสัตว์หน้าดิน	45	75
ค่าดัชนีความหลากหลายสัตว์หน้าดิน	1.0986	1.3322

Sample Location : 1. สถานี 2214593-1 : ท่าเรือ TPI  
2. สถานี 2214593-2 : ทะเลเปิดจุดที่ 1

Condition of Sample : contained in one plastic zip bag

  
.....  
(นายซาโจน์ เริ่มคำริห์)  
ผู้วิเคราะห์

  
.....  
(นายอภิลกต อินทรชาติ)  
หัวหน้าสถานีวิจัยประมงศรีราชา

ภาคผนวก ง.8

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ใบรับรองผลการตรวจวัดสารเบนซีน ภายในสถานประกอบการ



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.	: 0032/65
For	: UBE Chemicals (Asia) Public Company Limited	Sampling Date	: 05/01/2022
Address	: 140/6 Moo 4, Ta-Phong Sub-District, Muang District, Rayong Province 21000	Received Date	: 07/01/2022
		Test Date	: 10/01/2022
Tel/Fax	: 0-3892-8700 / 0-3892-8965	Report Date	: 15/01/2022

SAMPLE DESCRIPTION / SAMPLING INFORMATION

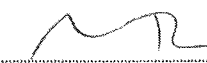
Sample Designated As	: Workplace Air	Sampling Method	: Sorbent Adsorption
Sampling By	: SECOT Co., Ltd.	Sample Condition	: Normal

Sampling Location	Sampling Date/Time	Compound	Analytical Method	ND	RESULT	STANDARD
				ppm	ppm	ppm
1320-V27	05/01/2022 09:00-13:00	Benzene	NIOSH 1501/GC FID	< 0.02	0.02	1
1320-P17	05/01/2022 09:05-13:05	Benzene	NIOSH 1501/GC FID	< 0.02	ND	1

Analyst By :

  
(Miss Narisa Poowasanpetch)

Approved By :

  
(Mrs. Araya Tipparuk)

Technical Management Team

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

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

3. Notification of the Department of Labour Protection and Welfare, B.E.2563 (2020).

4. ND = non-detectable.



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.	: 0924/65
For	: UBE Chemicals (Asia) Public Company Limited	Sampling Date	: 03/05/2022
Address	: 140/6 Moo 4, Ta-Phong Sub-District, Muang District, Rayong Province 21000	Received Date	: 05/05/2022
Tel/Fax	: 0-3892-8700 / 0-3892-8965	Test Date	: 09/05/2022
		Report Date	: 19/05/2022

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	RESULT	STANDARD
				ppm	ppm	ppm
1320-V27	03/05/2022	Benzene	NIOSH 1501/GC FID	< 0.02	ND	1
	09:23-11:36					
1320-P17	03/05/2022	Benzene	NIOSH 1501/GC FID	< 0.02	ND	1
	09:21-11:35					

Analyst By :

Sudaporn Soonthorn  
(Miss Sudaporn Soonthorn)

Approved By :

Narisa Poowasanpetch  
(Miss Narisa Poowasanpetch)

Technical Management Team

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

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

3. Notification of the Department of Labour Protection and Welfare, B.E.2560 (2017).

4. ND = non-detectable.

ภาคผนวก จ

ใบแสดงการสอบเทียบเครื่องมือ

THE LINDE GROUP

Linde

## CERTIFICATE OF ANALYSIS

Customer Detail:  
Secot Co., Ltd.

Production Order Number: 90133629

Material Number: 433000-AL-44

Certification Date: 10-Feb-2016

Expiry Date: 10-Feb-2024

Cylinder Description:

Aluminum 50 L

The measurement of this reference material is traceable to SI through the reference standard which is traceable to Swiss National Standard of Mass. The Assay of this Standard has been performed in accordance with the EPA Traceability Protocol EPA-600/R-12/531 for the Assay and Certification of Gaseous Calibration Standards using procedure G1. The results are expressed on a mole/mole basis, unless otherwise specified. The reported uncertainty is based on a standard uncertainty multiplied by coverage factor k=2, providing a level of confidence of approximately 95%.

Certificate Number:

0349/16

Analyst:

THITIRAT LOYRAT

Cylinder Number:

D595101

Nominal Cylinder Content:

6.900 M<sup>3</sup>

Approve:

SUKANYA KAMUTHARAT

Nominal Pressure:

145.0 Bar

Valve Outlet:

CGA 350 Brass

To Re-Order Please Quote:

433000-AL-44

Comment:

- It is recommended that this product be not used below 5% of actual contents or should not be used when its gas pressure is below 150psig.
- Other impurities that detect by analytical condition of this mixture shall be report if it is more than 10% of minimum minor component.
- Keep and use in well-ventilated and secure area.

บริษัท สินเท็ค (ประเทศไทย) จำกัด (มหาชน)

P.C. Registration no. 0107517000785

ชั้น 15 อาคารทาวเวอร์ เอ 2/3 หมู่ 14 ถนนบางนา-ตราด กม. 6.5 บางนา

Bangplee, Samutprakarn 10540, Tel (66) 2338-6100 โทรสาร (66) 2338-6333

โรงงานผลิต: 105 หมู่ 5 ถนนบางนา-ตราด ต.บางนาใหม่ อ.เมืองสมุทรปราการ 24180

โทรศัพท์ (66) 38.570-479-93

โทรสาร (66) 38.570-323

Linde (Thailand) Public Company Limited

P.C. Registration no. 0107517000785

15<sup>th</sup> Floor, Bangna Tower A, 2/3 Moo 14, Bangna Trad Km. 6.5 Road, Bangkaew

Bangplee, Samutprakarn 10540, Tel (66) 2338-6100 โทรสาร (66) 2338-6333

Wellgrow Plant: 105 Moo 5, T.Bangsamak, A.Bangpakong, Chachoengsao 24180

Thailand, Tel (66) 38.570-479-93

Fax (66) 38.570-323

THE LINDE GROUP

Linde

## CERTIFICATE OF ANALYSIS

## Analytical Result

Component	Request Concentration	Certified Concentration	Certified Uncertainty	Method	Assay Date
Carbon Monoxide In Nitrogen	40.0 ppm	40.1 ppm	± 1 % relative	(6) I-PB-352	09-Feb-2016

## Reference Standard used in Assay

Reference Standard	Cylinder No.	Concentration	Expired Date
Carbon Monoxide In Nitrogen	103090SG	50.02 ± 0.25 ppm	26-Nov-2019

## Analytical Instruments used in Assay

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Digi LAB Excalibur HE Series	FTIR-CO	25-Jan-2016

Method of Analysis

- Gas Chromatograph
- Paramagnetic Oxygen Analyser
- Electrochemical Oxygen Analyser
- Electrochemical Moisture Analyser
- Total Hydrocarbon Analyser
- Other specified

Cylinder Number D595101

Production Order Number 90133629

Certification Date: 10-Feb-2016

Expiration Date: 10-Feb-2024

Linde (Thailand) Public Company Limited

P.C. Registration no. 0107517000785

ชั้น 15 อาคารทาวเวอร์ เอ 2/3 หมู่ 14 ถนนบางนา-ตราด กม. 6.5 บางนา

Bangplee, Samutprakarn 10540, Tel (66) 2338-6100 โทรสาร (66) 2338-6333

Wellgrow Plant: 105 Moo 5, T.Bangsamak, A.Bangpakong, Chachoengsao 24180

Thailand, Tel (66) 38.570-479-93

Fax (66) 38.570-323

THE LINDE GROUP

Linde

Certificate of Analysis  
Special Gases Mixture

## Customer Details

Name: Secot Co., Ltd. Address: 239, Rimklongprapa Rd., Bangsue, Bangkok 10800 Customer Tag No.:

## Certificate Details

Number: 0225/22 Date of Issue: 31-Jan-2022 Expiry date: 31-Jan-2024  
Material Details  
Production Order: 90169721 Material Code: 614500-SK-44 Cylinder No.: A009325K  
Gas content: 5.52 M<sup>3</sup> Filling pressure: 145.0 bar Valve: CGA 660 SS  
Cylinder Owner: LINDE Cylinder Material: Spectra seal Cylinder Size: 40 L

## Laboratory Report

## Analytical Result

Component Nitric Oxide  
Normal Concentration 80.0 ppm  
Analysis Result<sup>1</sup> 83.3 ppm  
Uncertainty<sup>2</sup> ± 1% relative  
Method of Analysis<sup>3</sup> (6) I-PB-352  
Assay Date 24-Jan & 31-Jan-22  
Other NOx impurity In Nitrogen Less than 4.1 ppm

## Reference Standard used in Assay

Reference Standard Nitric Oxide In Nitrogen  
Cylinder number 122820SG Concentration 50.87 ± 0.25 ppm Expiry date: 6-May-2023

## Analytical Instruments used in Assay

Instrument/Make/Model FTIR Spectrometers Nicolet iS50  
Analytical Principle FTIR-NO  
Last Multipoint Calibration 10-Jan-2022

## Recommend usage condition

Minimum utilization: 5% of actual content or before expire date whichever comes first.  
Storage condition: Keep in well ventilation and secure area.

## Comments

When reordering, please quote the material number

## Note:

- All results expressed in this report are on mole/mole basis, unless otherwise specified. The Assay of this Standard has been performed in accordance with the EPA Traceability Protocol EPA-600/R-12/531 for the Assay and Certification of Gaseous Calibration Standards using procedure G1.
- The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%. The measurement of this material is traceable to the SI through the reference gas standard which is traceable to Swiss National Standard of Mass or other recognised national metrology institutes.
- (1) Gas Chromatography, (2) Paramagnetic Oxygen Analyzer, (3) Electrochemical Oxygen Analyzer, (4) Electrochemical Moisture Analyzer, (5) Total Hydrocarbon Analyzer, (6) Other - Specified

Page 1 of 1

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บริษัท ลินด์ (ประเทศไทย) จำกัด (มหาชน)

เลขที่เอกสาร: 01507000105

ชั้น 15 ถนนพหลโยธิน ต. 2/3 หมู่ 14 ถนนพหลโยธิน แขวง 6.5 แขวงบาง

อ.บางพลี อ.สมุทรปราการ 10540 โทรศัพท์ (66) 2338-6100 โทรสาร (66) 2338-6333

โรงงานผลิต: 05 หมู่ 5 ต.บางพลี อ.บางพลี จ.สมุทรปราการ 24180

โทรศัพท์ (66) 38.570-479-93

โทรสาร (66) 38.570-323

Sukanya Parinyasontorn

Signatory for and on behalf of Linde (Thailand) Co., Ltd.

Linde (Thailand) Public Company Limited

P.L.C. Registration No. 010753700195

15<sup>th</sup> Floor, Bangna Tower A, 2/3 Moo 14, Bangna Trad Km. 6.5 Road, Bangkok

Bangplee, Samutprakarn 10540, Tel (66) 2338-6100 Fax (66) 2338-6333

Wellgrow Plant: 105 Moo 5, T.Bangsamak, A.Bangpakong, Chachoengsao 24180

Thailand, Tel (66) 38.570-479-93

Fax (66) 38.570-323

PB-002/F006

Iss:K/2, 15 Oct 2021



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

Calibration Location : SECOT Co., Ltd. Calibration Date : Jan 13, 2022  
Hi-Vol Pump No. : BH-007 Indicator No. : CM-01  
Amb. Temp (°C) : 25 Press (mmHg) : 760  
Calibration by : Mr. Punkawin K.

Plate	Indicate (X) ( cm. )	True H <sub>2</sub> O ( in. )	Actual Flow (Y) (cfm)	XY	X <sup>2</sup>	Remark
18	18.20	12.50	58.84	1,070.89	331.24	
13	15.00	10.00	52.94	794.10	225.00	
10	11.80	7.80	46.90	553.42	139.24	
7	7.60	5.00	37.81	287.36	57.76	
5	4.40	3.00	29.58	130.15	19.36	
Sum	57.00	38.30	226.07	2,835.92	772.60	

Calibrated by : Punkawin Approved by : W. Hayan

[Jan 2022/BH-007/21/01/2022]

CAL-FROM001



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

Calibration Location : SECOT Co.,Ltd. Calibration Date : Jan 13, 2022  
 Hi-Vol Pump No. : BH-002 Indicator No. : CM-01  
 Amb. Temp (°C) : 25 Press (mmHg) : 760  
 Calibration by : Mr.Punkawin K.

Plate	Indicate (X) ( cm. )	True H <sub>2</sub> O ( in. )	Actual Flow (Y) (cfm)	XY	X <sup>2</sup>	Remark
18	16.20	11.90	57.45	930.69	262.44	
13	13.40	9.30	51.10	684.74	179.56	
10	11.00	7.40	45.72	502.92	121.00	
7	7.00	4.90	37.44	262.08	49.00	
5	4.20	3.00	29.58	124.24	17.64	
Sum	51.80	36.50	221.29	2,504.67	629.64	

Calibrated by : Punkawin Approved by : Wittaya K.

Sheet No. : CAL-M5008/01/22



## CONTROL UNIT CALIBRATION (Metric units, mm)

Date 13 Jan 22

Barometric press, Pb Initial Final Average  
 759 759 759 mmHg

### Dry Gas Meter Data

Console No. M50-08

Metering System ID

DGM Number 971415

DGM Model ES-110

Calibrated by : Montri P.

### Reference Dry Gas Meter Data

Serial No. 358794

Model S110

Correction factor (Yr) 0.9966

Last Calibration Date 8 Jan 22

Orifice manometer setting, ΔH mm H2O	Ref. DGM Volume V <sub>r</sub> Liters	DGM Volume V <sub>m</sub> Liters	Temperature (°C)				Time Θ min	DGM Correction factor (Y)	ΔH@ mm
			Ref DGM T <sub>r</sub>	Dry Gas Meter					
				Inlet T <sub>i</sub>	Outlet T <sub>o</sub>	Avg T <sub>m</sub>			
12.5	100.0	101.7	23	23	22	22.5	9.23	0.9771	49.1298
25.0	100.1	100.9	23	23	22	22.5	6.73	0.9847	52.1391
50.0	100.0	100.0	23	23	22	22.5	4.88	0.9902	55.0134
76.0	100.0	98.8	23	23	22	22.5	3.93	0.9997	54.2067
100.0	100.0	99.1	23	23	22	22.5	3.93	0.9945	52.8042
150.0	100.2	97.3	23	23	22	22.5	2.82	1.0099	54.6989

Average 0.9927 52.9987

Approved by : (Miss Katesarin Vorradetwittaya)





## PITOT TUBE CALIBRATION

Calibration Location: SECOT

Calibration Date : 14/01/2022

Calibrated duct No.: 1

Calibration Standard Pitot tube data

Pitot No. : Std-01

Coefficient (Cp) : 1

Type S Pitot No. : PS10-02

Calibrated by : Mr. Montri P.

## A Side Calibration

Run No.	$\Delta P_{std}$ (mm H <sub>2</sub> O)	$\Delta P_s$ (mm H <sub>2</sub> O)	Cp(s)	Deviation, $\delta$ Cp(s) - Cp(A)
1	7.55	10.75	0.8380	0.0095
2	7.55	11.00	0.8285	-0.0001
3	7.55	11.25	0.8192	-0.0094

 $C_{P(A),avg}$  0.8286

## B Side Calibration

Run No.	$\Delta P_{std}$ (mm H <sub>2</sub> O)	$\Delta P_s$ (mm H <sub>2</sub> O)	Cp(s)	Deviation, $\delta$ Cp(s) - Cp(B)
1	7.55	10.75	0.8380	0.0000
2	7.55	10.75	0.8380	0.0000
3	7.55	10.75	0.8380	0.0000

 $C_{P(B),avg}$  0.8380

 $|CP(A) - CP(B)| = 0.0095$ 
 $C_{P(Avg)} = 0.8333$ 

 Approved by :   
 (Miss Katesarin Vorradetwittaya)

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


## PITOT TUBE CALIBRATION

Calibration Location: SECOT

Calibration Date : 14/01/2022

Calibrated duct No.: 1

Calibration Standard Pitot tube data

Pitot No. : Std-01

Coefficient (Cp) : 1

Type S Pitot No. : PS20-02

Calibrated by : Mr. Montri P.

## A Side Calibration

Run No.	$\Delta P_{std}$ (mm H <sub>2</sub> O)	$\Delta P_s$ (mm H <sub>2</sub> O)	Cp(s)	Deviation, $\delta$ Cp(s) - Cp(A)
1	7.55	10.55	0.8460	0.0085
2	7.55	11.00	0.8285	-0.0090
3	7.55	10.75	0.8380	0.0006

 $C_{P(A),avg}$  0.8375

## B Side Calibration

Run No.	$\Delta P_{std}$ (mm H <sub>2</sub> O)	$\Delta P_s$ (mm H <sub>2</sub> O)	Cp(s)	Deviation, $\delta$ Cp(s) - Cp(B)
1	7.55	11.00	0.8285	-0.0097
2	7.55	10.50	0.8480	0.0098
3	7.55	10.75	0.8380	-0.0001

 $C_{P(B),avg}$  0.8382

 $|CP(A) - CP(B)| = 0.0007$ 
 $C_{P(Avg)} = 0.8378$ 

 Approved by :   
 (Miss Katesarin Vorradetwittaya)

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



## SOUND LEVEL METER CALIBRATION

Calibration Location: SECOT

Calibration Date: Jan 5, 22

## SOUND LEVEL CALIBRATOR

Brand	Model	Serial No.	Calibrated (dB)	Frequency (Hz)		
CASELLA	CEL120/2	2839225	114.0	1000		
No.	Brand	Model	Serial No.	Microphone Serial No.	SLM Reading (dB)	dB Adjust
3	CASELLA	CEL-246	1443758	1443758	113.7	0.3
4	CASELLA	CEL-246	1443817	1443817	113.8	0.2
5	CASELLA	CEL-246	1443838	1443838	113.8	0.2
6	CASELLA	CEL-246	3173108	3173108	113.5	0.5
7	CASELLA	CEL-246	3173125	3173125	113.6	0.4

Calibrated by :

Approved by :



## SOUND LEVEL METER CALIBRATION

Calibration Location: SECOT

Calibration Date: Mar 9, 22

## SOUND LEVEL CALIBRATOR

Brand	Model	Serial No.	Calibrated (dB)	Frequency (Hz)		
CASELLA	CEL120/2	2839225	114.0	1000		
No.	Brand	Model	Serial No.	Microphone Serial No.	SLM Reading (dB)	dB Adjust
6	CASELLA	CEL-246	3173108	3173108	114.0	0.0
7	CASELLA	CEL-246	3173125	3173125	114.0	0.0
8	CASELLA	CEL-246	3173135	3173135	114.0	0.0

Calibrated by :

Approved by :



ELECTRICAL AND ELECTRONICS INSTITUTE  
FOUNDATION FOR INDUSTRIAL DEVELOPMENT

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

Phraek Sa, Mueang Samut Prakan, Samut Prakan 10280

Tel: +66 2709 4860-8 Fax: +66 2324 0917-8



Certificate No.: CP20210097EA  
Operation No.: CP2021120018

Certificate of Calibration

Equipment: Sound Calibrator

Manufacturer: CASELLA

Model/Type: CEL-120/1

Serial No.: 0254955

ID No.: -

Customer: SECOT Co.,Ltd.

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

Received Date: 21 December 2021

Calibrated Date: 24 December 2021

Issued Date: 28 December 2021

Calibrated by: Ms. Juntaporn Kunhakom

Approved by:

( Mr. Sittichai Swaksuriyawong )  
Group Manager

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

The reported uncertainty of measurement was based on standard uncertainty multiplied by a coverage factor  $k = 2.00$ , providing a level of confidence of approximately 95%. This certificate may not be reproduced other than in full except with the prior written approval of the Electrical and Electronics Institute, Foundation for Industrial Development.



ELECTRICAL AND ELECTRONICS INSTITUTE  
FOUNDATION FOR INDUSTRIAL DEVELOPMENT

Certificate No.: CP20210097EA

Calibration Report

Equipment: Sound Calibrator  
Manufacturer: CASELLA  
Model/Type: CEL-120/1  
Serial No.: 0254955  
ID No.: -  
Ambient Temperature:  $(23 \pm 2) ^\circ\text{C}$   
Relative Humidity:  $(50 \pm 15) \%$   
Pressure:  $(101.3 \pm 1.5) \text{ kPa}$

Method of Calibration :-

IEC 60942:2017

Condition of this result of calibration

1. Reference standards instrument :-

Instrument	Model	Serial No.	Cert. No.	Due Date
1) Standard microphone	4180	2661000	AA-1010-21	13 June 2022
2) Waveform Generator	33511B	MY52302264	0144RF21	17 June 2022
3) Audio Analyzing DMM	2015-P	4079144	E1U210398	2 February 2022
4) Pressure humidity and Temperature Transmitter	PTU301	F0640002	CL1-P210047 0255TE21	16 June 2022 7 July 2022

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; ONSC Accredited Calibration No.0119

Result of Calibration:-

1. Function : Sound pressure level

Normal	Specified Sound	Measured value	Deviated value <sup>[1]</sup>	Acceptance limit <sup>[2]</sup>
Frequency (Hz)	Pressure level (dB)	(dB)	(dB)	(dB)
1000	94	93.92	-0.08	$\pm 0.25$
1000	114	113.95	-0.05	$\pm 0.25$

2. Function : Frequency

Normal Sound	Specified Frequency	Measured value	Deviated value <sup>[2]</sup>	Acceptance limit <sup>[3]</sup>
Pressure Level (dB)	(Hz)	(Hz)	(%)	(%)
94	1000	1000.0	0.0	$\pm 0.7$
114	1000	1000.0	0.0	$\pm 0.7$



ELECTRICAL AND ELECTRONICS INSTITUTE  
FOUNDATION FOR INDUSTRIAL DEVELOPMENT

Certificate No.: CP20210097EA

Calibration Report

3. Function : Total distortion + noise

Normal	Normal	Measured value <sup>[4]</sup>	Acceptance limit <sup>[5]</sup>
Sound Pressure level (dB)	Frequency (Hz)	(%)	(%)
94	1000	2.5	2.5
114	1000	0.4	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.

-- End of Report --

# CERTIFICATE OF CALIBRATION

ISSUED BY Noisemeters

DATE OF ISSUE 06/04/22

CERTIFICATE NUMBER 172690

NoiseMeters

NoiseMeters  
Acoustic House  
Bridlington Road  
Hunmanby  
YO14 0PH  
United Kingdom  
www.noisemeters.com

Page 1 of 1

Test engineer:  
Nigel Smith  
Electronically signed:

## doseBadge Reader

### Instrument

Manufacturer: Cirrus Research plc  
Model Number: RC:110A

Serial Number: 95168  
Notes:

### Calibration Procedure

The tests were carried out in accordance with the requirements of IEC 60942:2003 where applicable.

Date of Calibration: 06 April 2022

### Functionality Results

Function	Result
Keypad	Pass
Battery Power	Pass
Display	Pass
Communication	Pass
2 way IR link	Pass
Clock	Pass

### Calibration Results

	Level (dB)	Frequency (Hz)	Distortion (% THD + Noise)
Initial	113.90	993.3	0.46
Adjusted	114.00	993.3	0.46
Uncertainty	± 0.11	± 0.14	± 0.10
Tolerances	± 0.60	± 2.00	± 4.00

### Environmental Conditions

Pressure: 98.30 kPa  
Temperature: 22.6 °C  
Humidity: 42.3 %

### 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%.

ภาคผนวก จ

## วิธีการตรวจวัดและวิเคราะห์คุณภาพสิ่งแวดล้อม

ตารางที่ จ-1 วิธีการตรวจวัดและวิเคราะห์คุณภาพสิ่งแวดล้อม

โครงการโรงงานผลิตคาโปรแลคตัม บริษัท อุเบะ เคมิคอลส์ (เอเชีย) จำกัด (มหาชน)

พารามิเตอร์	วิธีการตรวจวัด	วิธีการวิเคราะห์
<b>1. คุณภาพอากาศในบรรยากาศ</b>		
- ความเร็วและทิศทางลม (Wind Speed/ Wind Direction)	Wind Vane and Cup Anemometer	ASTM : D5741-96
- ฝุ่นละอองรวม (TSP)	High Volume Air Sampler	Pre-Post Weight Difference
- ฝุ่นละอองขนาดเล็กไม่เกิน 10 ไมครอน (PM-10)	Size Selective Inlet High Volume Air Sampler	Pre-Post Weight Difference
- ก๊าซไนโตรเจนไดออกไซด์ (NO <sub>2</sub> )	Instrumental Reference Method	Chemiluminescence
- ก๊าซซัลเฟอร์ไดออกไซด์ (SO <sub>2</sub> )	Instrumental Reference Method	UV Fluorescence
- ก๊าซคาร์บอนมอนอกไซด์ (CO)	Instrumental Reference Method	Non-Dispersive Infrared Detection
<b>2. คุณภาพอากาศจากปล่องระบายอากาศ</b>		
- ฝุ่นละออง (PM)	Isokinetic Stack Sampling Technique	Pre-Post Weight Difference (U.S. EPA Method 5)
- ก๊าซซัลเฟอร์ไดออกไซด์ (SO <sub>2</sub> )	Impingement Absorption	Barium-thorin Titration Method (U.S. EPA Method 6)
- ก๊าซออกไซด์ของไนโตรเจน (NO <sub>x</sub> )	Vacuum Flask	Phenoldisulfonic Acid Method (U.S. EPA Method 7)
- ก๊าซคาร์บอนมอนอกไซด์ (CO)	Bag Sampling	Non-dispersive Infrared Detection (U.S. EPA Method 10)
- ก๊าซแอมโมเนียที่ละลาย (NH <sub>3</sub> Slip)	Impingement Absorption	CTM-027/Ion Chromatography
<b>3. ระดับเสียง</b>		
- ระดับเสียงเฉลี่ย 24 ชั่วโมง (Leq(24))	Sound Pressure Level Meter	-
- ระดับเสียงเปอร์เซ็นต์ไทล์ที่ 90 (L <sub>90</sub> )	Sound Pressure Level Meter	-
- ระดับเสียงสูงสุด (Lmax)	Sound Pressure Level Meter	-
- การจัดทำ Noise Contour Map	Sound Pressure Level Meter	โปรแกรม SURFER
- ระดับเสียงที่ความถี่ต่างๆ	Octave Band Analyzer	-
- ระดับเสียงเฉลี่ย 12 ชั่วโมง (Leq(12))	Sound Pressure Level Meter	-
- ปริมาณเสียงสะสมที่ตัวพนักงาน (TWA)	Noise Dosimeter	-

## ตารางที่ ก-1 วิธีการตรวจวัดและวิเคราะห์คุณภาพสิ่งแวดล้อม

## โครงการโรงงานผลิตคาปรีแลคตัม บริษัท อุเบะ เคมิคอลส์ (เอเชีย) จำกัด (มหาชน) (ต่อ)

พารามิเตอร์	วิธีการตรวจวัด	วิธีการวิเคราะห์
<b>4. คุณภาพน้ำทิ้ง</b>		
- อัตราการไหล (Flow Rate)	Flow Meter	-
- อุณหภูมิ (Temperature)	Grab Sampling	Thermometer
- ความเป็นกรด-ด่าง (pH)	Grab Sampling	Electrometric Method
- ของแข็งแขวนลอย (SS)	Grab Sampling	Dried at 103-105 °C
- ปริมาณของแข็งละลายน้ำทั้งหมด (TDS)	Grab Sampling	Dried at 103-105 °C
- บีโอดี (BOD <sub>5</sub> )	Grab Sampling	5-Day BOD Test, Membrane Electrode
- น้ำมันและไขมัน (Oil & Grease)	Grab Sampling	Partition-Gravimetric
- ซีโอดี (COD)	Grab Sampling	Close Reflux, Titrimetric
<b>5. คุณภาพน้ำทะเล</b>		
- ความเร็วกระแสน้ำ (Velocity)	Flow Meter	-
- อุณหภูมิ (Temperature)	Grab Sampling	Thermometer
- ความเป็นกรด-ด่าง (pH)	Grab Sampling	Electrometric Method
- ความลึกน้ำ (Depth)	Grab Sampling	Meter Line
- ความโปร่งแสง (Transparency)	Grab Sampling	Secchi Disc
- ของแข็งแขวนลอย (SS)	Grab Sampling	Dried at 103-105 °C
- ปริมาณออกซิเจนละลาย (DO)	Grab Sampling	Membrane Electrode
- ปริมาณของแข็งละลายน้ำทั้งหมด (TDS)	Grab Sampling	Dried at 103-105 °C
- บีโอดี (BOD <sub>5</sub> )	Grab Sampling	5-Day BOD Test, Membrane Electrode
- น้ำมันและไขมัน (Oil & Grease)	Grab Sampling	Partition-Gravimetric
- ซีโอดี (COD)	Grab Sampling	Close Reflux, Titrimetric
- ความขุ่น (Turbidity)	Grab Sampling	Nephelometric
- ความเค็ม (Salinity)	Grab Sampling	Electrical Conductivity
- ไนโตรเจนในรูปแอมโมเนีย (NH <sub>3</sub> -N)	Grab Sampling	Distillation and Titrimetric
- แบคทีเรียในกลุ่มโคลิฟอร์มทั้งหมด (Total Coliform Bacteria)	Grab Sampling	Multiple Tube Fermentation Technique
- ฟอสเฟต (PO <sub>4</sub> -P)	Grab Sampling	Ascorbic Acid

ตารางที่ ฉ-1 วิธีการตรวจวัดและวิเคราะห์คุณภาพสิ่งแวดล้อม

โครงการโรงงานผลิตคาโปรแลคตัม บริษัท อุเบะ เคมิคอลส์ (เอเชีย) จำกัด (มหาชน) (ต่อ)

พารามิเตอร์	วิธีการตรวจวัด	วิธีการวิเคราะห์
<b>5. คุณภาพน้ำทะเล (ต่อ)</b> - โปรอท (Hg)	Grab Sampling	Cold-Vapour Fluorescence
<b>6. คุณภาพน้ำใต้ดิน</b> - ความเป็นกรด-ด่าง (pH)	Grab Sampling	Electrometric Method
- ปริมาณของแข็งละลายน้ำทั้งหมด (TDS)	Grab Sampling	Dried at 103-105 °C
- ไนเตรต-ไนโตรเจน (NO <sub>3</sub> -N)	Grab Sampling	Cadmium Reduction Electrometric
- คลอไรด์ (Cl <sup>-</sup> )	Grab Sampling	Argentometric
- เหล็กทั้งหมด (Fe)	Grab Sampling	Digestion, Direct-Air Acetylene Flame
- โปรอท (Hg)	Grab Sampling	Cold-Vapor Atomic Absorption Spectrometric
- ความกระด้างทั้งหมด (Hardness)	Grab Sampling	EDTA Titrimetric
- แบคทีเรียในกลุ่มโคลิฟอร์มทั้งหมด (Total Coliform Bacteria)	Grab Sampling	Multiple Tube Fermentation Technique
<b>7. นิเวศวิทยาทางทะเลและการประมง</b> - แพลงก์ตอนและสัตว์หน้าดิน	Grab Sampling	Counting Technique
<b>8. สารเบนซีนในพื้นที่ที่มีการทำงานเกี่ยวข้องกับสารเบนซีน</b>	Sorbent Tube	Gas Chromatography (NIOSH 1501)



ภาคผนวก ข

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ใบอนุญาตขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน  
จากกรมโรงงานอุตสาหกรรม



ที่ อก ๐๓๑๐(๑)/ ๑๗๔ ๕

กรมโรงงานอุตสาหกรรม  
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท  
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๐๕ กุมภาพันธ์ ๒๕๖๕

เรื่อง เปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท ซีคอฟ จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน  
ลงวันที่ ๒๘ มกราคม ๒๕๖๕

ตามหนังสือที่อ้างถึง บริษัท ซีคอฟ จำกัด ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ว-๒๓๔๙  
สถานที่ตั้งเลขที่ ๒๓๔ ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพมหานคร ขอเปลี่ยนแปลง  
บุคลากรของห้องปฏิบัติการวิเคราะห์ ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้

๑. ให้ยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๔ ราย

- |                                      |                             |
|--------------------------------------|-----------------------------|
| ๑) นางสาวโชติมาส ไทยเจริญ            | ทะเบียนเลขที่ ว-๒๓๔๙-จ-๖๐๐๖ |
| ๒) นางสาวณัฐศิริ เลิศธีรพัฒน์        | ทะเบียนเลขที่ ว-๒๓๔๙-จ-๖๐๒๓ |
| ๓) นางสาวเกษวิรินทร์ ศิลศึก          | ทะเบียนเลขที่ ว-๒๓๔๙-จ-๖๔๒๔ |
| ๔) นางสาวจิรนนท์ จิตุหะศรี ปิยะธนากร | ทะเบียนเลขที่ ว-๒๓๔๙-จ-๗๒๓๒ |

๒. ให้เพิ่มผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๑ ราย

- |                            |                             |
|----------------------------|-----------------------------|
| นางสาวณัฐศิริ เลิศธีรพัฒน์ | ทะเบียนเลขที่ ว-๒๓๔๙-จ-๐๐๐๑ |
|----------------------------|-----------------------------|

๓. ให้เพิ่มเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๒ ราย

- |                                    |                             |
|------------------------------------|-----------------------------|
| ๑) นางสาวสุดาพร สุนทร              | ทะเบียนเลขที่ ว-๒๓๔๙-จ-๐๐๐๑ |
| ๒) นางสาวสัญญาณัฐณ์ อินทรประสิทธิ์ | ทะเบียนเลขที่ ว-๒๓๔๙-จ-๐๐๐๒ |

อนึ่ง หนังสือฉบับนี้จะหมดอายุพร้อมหนังสือต่ออายุรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน  
ที่ อก ๐๓๑๐(๑)/๑๗๔๐๔ ลงวันที่ ๒๑ ตุลาคม ๒๕๖๓ คือในวันที่ ๒ พฤษภาคม ๒๕๖๖ ทั้งนี้ สามารถยื่นคำ  
ขอผ่านระบบอิเล็กทรอนิกส์ได้ที่หน้าเว็บไซต์กรมโรงงานอุตสาหกรรม ตาม QR Code ท้ายหนังสือฉบับนี้

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

  
(นางจินดา เดชะศรีรินทร์)

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน  
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม



ยื่นคำขอผ่านระบบอิเล็กทรอนิกส์

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๔๙

ไปรษณีย์อิเล็กทรอนิกส์ saraban@diw.mail.go.th



ที่ อก ๐๓๑๐(๑)/ ๑๗๔ ๐ ๕

กรมโรงงานอุตสาหกรรม  
ถนนพระรามที่ ๖ เขตราชเทวี  
กรุงเทพมหานคร ๑๐๔๐๐

๒๑ ตุลาคม ๒๕๖๓

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท ซีคอฟ จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน  
ลงวันที่ ๒๔ มีนาคม ๒๕๖๓

สิ่งที่ส่งมาด้วย ๑. รายชื่อผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๑ แผ่น

๒. รายชื่อเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๑ แผ่น

๓. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๒ แผ่น

ตามหนังสือที่อ้างถึง บริษัท ซีคอฟ จำกัด ขอต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการ  
วิเคราะห์เอกชน เลขทะเบียน ว-๒๓๔๙ สถานที่ตั้งเลขที่ ๒๓๔ ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ  
กรุงเทพมหานคร ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท ซีคอฟ จำกัด ต่ออายุหนังสือรับขึ้นทะเบียน  
ห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๑๐ ราย ตามสิ่งที่ส่งมาด้วย ๑

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๓๑ ราย ตามสิ่งที่ส่งมาด้วย ๒

ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย จำนวน ๔๖ รายการ น้ำใต้ดิน  
จำนวน ๑๒๓ รายการ อากาศเสีย จำนวน ๒๗ รายการ สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว จำนวน ๓๔ รายการ  
และดิน จำนวน ๑๒๒ รายการ รวมทั้งสิ้นจำนวน ๓๕๒ รายการ ตามสิ่งที่ส่งมาด้วย ๓

หนังสือฉบับนี้จะหมดอายุในวันที่ ๒ พฤษภาคม ๒๕๖๖ หากประสงค์จะต่ออายุหนังสือ  
รับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อ  
กรมโรงงานอุตสาหกรรมภายใน ๓๐ วัน ก่อนวันสิ้นสุดอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน  
ซึ่งคำขอต่ออายุดังกล่าวขอรับได้ที่กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

  
(นางจินดา เดชะศรีรินทร์)

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน  
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๒๐๒ ๔๐๐๒ ๐ ๒๒๐๒ ๔๑๔๖

โทรสาร ๐ ๒๒๕๕ ๓๒๐๘ ๐ ๒๒๕๕ ๓๔๑๕

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท ซีคोट จำกัด

เลขทะเบียน ว-๒๓๙

ที่ อก ๐๓๑๐(๑)/ ๑ ๑ ๘ ๐ ๕

ลงวันที่ ๒๑ ตุลาคม ๒๕๖๓

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๑๐ ราย

๑) นางสาวฤดี เกรียงไกรอุดม	ทะเบียนเลขที่ ว-๒๓๙-ก-๕๘๒๐
๒) นางสาวอารยา ทิพรักษ์	ทะเบียนเลขที่ ว-๒๓๙-ก-๕๘๖๓
๓) นายขรรชัย เกรียงไกรอุดม	ทะเบียนเลขที่ ว-๒๓๙-ก-๕๙๗๕
๔) นางสาวเพชรดา อินทร์	ทะเบียนเลขที่ ว-๒๓๙-ก-๕๙๗๖
๕) นางสาวปรีดา สมใจ	ทะเบียนเลขที่ ว-๒๓๙-ก-๕๙๗๘
๖) นางสาวอริยญา มาตา	ทะเบียนเลขที่ ว-๒๓๙-ก-๕๙๗๙
๗) นางสาวดาวาลย์ วงศ์เจริญ	ทะเบียนเลขที่ ว-๒๓๙-ก-๕๙๘๐
๘) นางสาวมณีนววรรณ เกตะวันดี	ทะเบียนเลขที่ ว-๒๓๙-ก-๕๙๘๒
๙) นางสาวนริสา ภูวสรเพ็ญ	ทะเบียนเลขที่ ว-๒๓๙-ก-๖๔๑๙
๑๐) นางสาวศิริวรรณ นิยมสง่า	ทะเบียนเลขที่ ว-๒๓๙-ก-๖๔๒๐

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท ซีคोट จำกัด

เลขทะเบียน ว-๒๓๙

ที่ อก ๐๓๑๐(๑)/ ๑ ๑ ๘ ๐ ๕

ลงวันที่ ๒๑ ตุลาคม ๒๕๖๓

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๓๑ ราย

๑) นางสาวสุรชวดี ชัยธรรม	ทะเบียนเลขที่ ว-๒๓๙-จ-๕๘๒๕
๒) นางสาวสุธาทิพย์ เทียนเตี้ย	ทะเบียนเลขที่ ว-๒๓๙-จ-๕๘๒๙
๓) นางสาวสุนันทา ศิริวัฒนานนท์	ทะเบียนเลขที่ ว-๒๓๙-จ-๕๘๘๓
๔) นายบวร ดิษฐ์ยะ	ทะเบียนเลขที่ ว-๒๓๙-จ-๕๘๘๖
๕) นางสาวเกศรินทร์ วรเดชาวิทยา	ทะเบียนเลขที่ ว-๒๓๙-จ-๕๙๙๑
๖) นายอนันต์ ภูมิวันนา	ทะเบียนเลขที่ ว-๒๓๙-จ-๖๐๐๑
๗) นายจิตพล สมประสงค์	ทะเบียนเลขที่ ว-๒๓๙-จ-๖๐๐๒
๘) นางสาวศศิธร พรหมประเสริฐ	ทะเบียนเลขที่ ว-๒๓๙-จ-๖๐๐๓
๙) นายศิวะนนท์ กุลวงษ์	ทะเบียนเลขที่ ว-๒๓๙-จ-๖๐๐๕
๑๐) นางสาวโชติมาส ไทยเจริญ	ทะเบียนเลขที่ ว-๒๓๙-จ-๖๐๐๖
๑๑) นางสาวปิยขวัญ สุระโคตร	ทะเบียนเลขที่ ว-๒๓๙-จ-๖๔๒๑
๑๒) นางสาวณัฐศิริ เลิศธีรพัฒน์	ทะเบียนเลขที่ ว-๒๓๙-จ-๖๔๒๓
๑๓) นางสาวเกษรวิมล คิลศึก	ทะเบียนเลขที่ ว-๒๓๙-จ-๖๔๒๔
๑๔) นางสาวอลิษา คณิรานนท์	ทะเบียนเลขที่ ว-๒๓๙-จ-๗๒๓๑
๑๕) นางสาวจิรนนท์ จิตตะศรี ปิยะธนากร	ทะเบียนเลขที่ ว-๒๓๙-จ-๗๒๓๒
๑๖) นางสาวสิริวรรณ แก้วชิงดวง	ทะเบียนเลขที่ ว-๒๓๙-จ-๗๒๓๓
๑๗) นางสาวปัทมวรรณ สุวรรณวิโรจน์	ทะเบียนเลขที่ ว-๒๓๙-จ-๗๒๓๔
๑๘) นางสาวกนิษฐา เจริญเชื้อ	ทะเบียนเลขที่ ว-๒๓๙-จ-๗๒๓๖
๑๙) นายจิรากร ลิ้มศิลา	ทะเบียนเลขที่ ว-๒๓๙-จ-๗๒๓๗
๒๐) นายชนาธิป สิงห์เกษมศักดิ์	ทะเบียนเลขที่ ว-๒๓๙-จ-๗๒๓๘
๒๑) นายวัชรภานต์ ประมาคะเต	ทะเบียนเลขที่ ว-๒๓๙-จ-๗๒๔๐
๒๒) นายทอง เฮงขวัญกุล	ทะเบียนเลขที่ ว-๒๓๙-จ-๗๒๔๒
๒๓) นางสาวกฤษณา จันทุม	ทะเบียนเลขที่ ว-๒๓๙-จ-๗๘๐๒
๒๔) นางสาวพรนภา บุตรธรรม	ทะเบียนเลขที่ ว-๒๓๙-จ-๗๘๐๓
๒๕) นางสาวธาริณี อาจปลิว	ทะเบียนเลขที่ ว-๒๓๙-จ-๗๘๐๔
๒๖) นายธนโชติ ช่างล้อ	ทะเบียนเลขที่ ว-๒๓๙-จ-๗๘๐๖
๒๗) นางสาวพัชรา สมานันท์	ทะเบียนเลขที่ ว-๒๓๙-จ-๘๑๘๓
๒๘) นางสาวจุฑารัตน์ แจ่มเรือน	ทะเบียนเลขที่ ว-๒๓๙-จ-๘๔๕๓
๒๙) นางสาวจณิสตา กุ้ยอ่อน	ทะเบียนเลขที่ ว-๒๓๙-จ-๘๔๕๗
๓๐) นางสาววริญญา เขียนมัน	ทะเบียนเลขที่ ว-๒๓๙-จ-๘๔๕๘
๓๑) นางสาวจิรารัตน์ นริตมนต์	ทะเบียนเลขที่ ว-๒๓๙-จ-๘๔๕๙

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท ซีคอป จำกัด

เลขทะเบียน ว-๒๓๙

ที่ อก ๐๓๑๐(๑)/ ๑๑ ๘ ๐ ๔

ลงวันที่ ๒๑ ตุลาคม ๒๕๖๓

ขอขยายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๕๒ รายการ

นำเลย จำนวน 46 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
2	Arsenic	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
3	Barium	1) Digestion, Direct Nitrous Oxide-Acetylene Flame Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
4	α-BHC	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
5	β-BHC	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
6	γ-BHC	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
7	δ-BHC	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
8	Biochemical Oxygen Demand	1) 5-Day BOD Test, Azide Modification Method <sup>[4]</sup> 2) 5-Day BOD Test, Membrane Electrode Method <sup>[4]</sup>
9	Cadmium	1) Digestion, Direct Air-Acetylene Flame Method <sup>[4]</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>[4]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>



(นางริกาญจน์ จิตรสกุลไธ)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

10 Chemical...

-๒-

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
10	Chemical Oxygen Demand	1) Open Reflux, Titrimetric method <sup>[4]</sup> 2) Close Reflux, Colorimetric method <sup>[4]</sup> 3) Closed Reflux, Titrimetric Method <sup>[4]</sup>
11	Chlordane	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
12	Chromium	1) Digestion, Direct Air-Acetylene Flame Method <sup>[4]</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>[4]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
13	Color	ADMI Weighted-Ordinate Spectrophotometric Method <sup>[4]</sup>
14	Copper	1) Digestion, Direct Air-Acetylene Flame Method <sup>[4]</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>[4]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
15	Cyanide	Distillation, Colorimetric method <sup>[4]</sup>
16	2,4-D	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
17	4,4'-DDD	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
18	4,4'-DDE	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
19	4,4'-DDT	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
20	Dieldrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>



(นางริกาญจน์ จิตรสกุลไธ)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

และทะเบียนห้องปฏิบัติการ

21 Endosulfan I...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
21	Endosulfan I	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
22	Endosulfan II	2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
23	Endosulfan Sulfate	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
24	Endrin	2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
25	Endrin Aldehyde	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
26	Formaldehyde	2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
27	Free Chlorine	Distillation, Colorimetric Method <sup>[3]</sup>
28	Heptachlor	1) Iodometric Method <sup>[4]</sup>
29	Heptachlor epoxide	2) DPD Colorimetric Method <sup>[4]</sup>
30	Hexavalent Chromium	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
31	Lead	2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
		1) Colorimetric Method <sup>[4]</sup>
		2) Extraction, Air-Acetylene Flame Method <sup>[4]</sup>
		3) Digestion, Direct Air-Acetylene Flame Method <sup>[4]</sup>
		2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>[4]</sup>
		3) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>

วิมล

(นางริกาญจน์ อัครสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีวิเคราะห์ทดสอบมลพิษ

32 Manganese...

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

วิมล

(นางริกาญจน์ อัครสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีวิเคราะห์ทดสอบมลพิษ

น้ำไดคิน...

น้ำใต้ดิน จำนวน 123 รายการ

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

วิมล

16 Beryllium...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
16	Beryllium	Digestion, Inductively Coupled Plasma Spectrometric Method <sup>[4]</sup>
17	Bis(2-chloroethyl)ether	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
18	Bis(2-ethylhexyl)phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
19	Bromodichloromethane	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
20	Bromoform	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
21	Butanol	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
22	Butyl benzyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
23	Cadmium	1) Digestion, Direct Air-Acetylene Flame Method <sup>[4]</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>[4]</sup> 3) Digestion, Inductively Coupled Plasma Spectrometric Method <sup>[4]</sup>
24	Carbazole	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
25	Carbon disulfide	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
26	Carbon tetrachloride	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
27	Chlordane	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
28	p-Chloroaniline	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
29	Chlorobenzene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
30	Chlorodibromomethane	Purge and Trap Gas Chromatographic/Mass spectrometric Method <sup>[4]</sup>
31	Chloroform	Purge and Trap Gas Chromatographic/Mass spectrometric Method <sup>[4]</sup>

วิมล

(นางริกาญจน์ ฉัตรสกุลวิไล)

32 2-Chlorophenol...

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
32	2-Chlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
33	Chromium	1) Digestion, Direct Air-Acetylene Flame Method <sup>[4]</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>[4]</sup> 3) Digestion, Inductively Coupled Plasma Spectrometric Method <sup>[4]</sup>
34	Chromium (III)	1) Digestion, Direct Air-Acetylene Flame Method; Colorimetric Method; Calculation <sup>[4]</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method; Colorimetric Method; Calculation <sup>[4]</sup> 3) Digestion, Inductively Coupled Plasma Spectrometric Method; Colorimetric Method; Calculation <sup>[4]</sup>
35	Chromium (VI)	1) Colorimetric Method <sup>[4]</sup> 2) Extraction, Air-Acetylene Flame Method <sup>[4]</sup>
36	Chrysene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
37	Cyanide	1) Distillation, Titrimetric Method <sup>[4]</sup> 2) Distillation, Colorimetric Method <sup>[4]</sup>
38	2,4-D	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup>
39	DDD	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
40	DDE	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
41	DDT	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>

วิมล

42 Dibenz(a,h)...

(นางรวิภาญจน์ จิตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ  
และทะเบียนห้องปฏิบัติการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
42	Dibenz(a,h)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
43	Di-n-butyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
44	1,2-Dichlorobenzene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
45	1,3-Dichlorobenzene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
46	1,4-Dichlorobenzene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
47	3,3'-Dichlorobenzidine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
48	1,1-Dichloroethane	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
49	1,2-Dichloroethane	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
50	1,1-Dichloroethylene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
51	cis-1,2-Dichloroethylene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
52	trans-1,2-Dichloroethylene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
53	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
54	1,2-Dichloropropane	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
55	1,3-Dichloropropane	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
56	1,3-Dichloropropene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
57	Dieldrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
58	Diethyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>

วิมล

59 2,4-Dimethylphenol...

(นางรวิภาญจน์ จิตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ  
และทะเบียนห้องปฏิบัติการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
59	2,4-Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
60	2,4-Dinitrophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
61	2,4-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
62	2,6-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
63	Di-n-Octyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
64	Endosulfan	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
65	Endrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
66	Ethylbenzene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
67	Fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
68	Fluorene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
69	Heptachlor	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
70	Heptachlor epoxide	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
71	Hexachlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
72	Hexachloro-1,3-butadiene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>

73 n-Hexane...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
73	n-Hexane	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
74	$\alpha$ -HCH	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
75	$\beta$ -HCH	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
76	$\gamma$ -HCH	1) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[4]</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
77	Hexachlorocyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
78	Hexachloroethane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
79	Indeno(1,2,3-cd)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
80	Isophorone	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
81	Lead	1) Digestion, Direct Air-Acetylene Flame Method <sup>[4]</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>[4]</sup> 3) Digestion, Inductively Coupled Plasma Spectrometric Method <sup>[4]</sup>
82	Manganese	1) Digestion, Direct Air-Acetylene Flame Method <sup>[4]</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>[4]</sup> 3) Digestion, Inductively Coupled Plasma Spectrometric Method <sup>[4]</sup>
83	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>[4]</sup>
84	Methanol	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>

85 Methoxychlor...

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

97 pH...

วิมล  
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และประเมินผลกระทบต่อสุขภาพ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
97	pH	Electrometric method <sup>[4]</sup>
98	Phenanthrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
99	Phenol	1) Distillation, Chloroform Extraction Method <sup>[4]</sup> 2) Distillation, Direct Photometric Method <sup>[4]</sup> 3) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
100	Pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
101	Selenium	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
102	Silver	1) Digestion, Direct Air-Acetylene Flame Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup>
103	Styrene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
104	1,1,2,2-Tetrachloroethane	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
105	Tetrachloroethylene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
106	Toluene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
107	TPH (C <sub>5</sub> -C <sub>8</sub> )	Purge and Trap, Gas Chromatographic/ Mass spectrometric Method <sup>[7,9]</sup>
108	TPH (C <sub>8</sub> -C <sub>16</sub> )	1) Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[6,8]</sup> 2) Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass spectrometric Method <sup>[6,9]</sup>
109	TPH (C <sub>16</sub> -C <sub>35</sub> )	1) Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[6,8]</sup> 2) Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass spectrometric Method <sup>[6,9]</sup>
110	1,2,4-Trichlorobenzene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
111	1,1,1-Trichloroethane	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>

112 1,1,2-Trichloroethane...

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
112	1,1,2-Trichloroethane	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
113	Trichloroethylene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
114	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
115	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
116	1,3,5-Trimethylbenzene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
117	Vanadium	Digestion, Inductively Coupled Plasma Spectrometric Method <sup>[4]</sup>
118	Vinyl chloride	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
119	m-Xylene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
120	o-Xylene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
121	p-Xylene	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
122	Xylene (Total)	Purge and Trap Gas Chromatographic/ Mass spectrometric Method <sup>[4]</sup>
123	Zinc	1) Digestion, Direct Air-Acetylene Flame Method <sup>[4]</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>[4]</sup> 3) Digestion, Inductively Coupled Plasma Spectrometric Method <sup>[4]</sup>

## อากาศเสีย (ปล่อยระบาย) จำนวน 27 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Antimony	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>



(นางริกาญจน์ จิตตรสกุสวไล)

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2 Arsenic...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
2	Arsenic	1) Isokinetic Sampling, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
3	Beryllium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
4	Cadmium	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
5	Carbon monoxide	Instrumental Analyzer Method <sup>[5]</sup>
6	Chlorine	1) Absorption Sampling, Ion Chromatographic Method <sup>[5]</sup> 2) Isokinetic Sampling, Ion Chromatographic Method <sup>[5]</sup>
7	Chromium	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
8	Cobalt	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
9	Copper	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
10	Cresol	Adsorption Sampling, Gas Chromatographic Method <sup>[5]</sup>
11	Dioxin/Furans	Isokinetic Sampling, Analysis by ISO/IEC 17025 Accredited Laboratory or Analysis by Department of Industrial Works Registered Laboratory (Dioxins/Furans Analysis Approved) <sup>[5]</sup>
12	Hydrogen chloride	1) Absorption Sampling, Ion Chromatographic Method <sup>[5]</sup> 2) Isokinetic Sampling, Ion Chromatographic Method <sup>[5]</sup>
13	Hydrogen Fluoride	1) Absorption Sampling, Ion Chromatographic Method <sup>[5]</sup> 2) Isokinetic Sampling, Ion Chromatographic Method <sup>[5]</sup>



(นางริกาญจน์ จิตตรสกุสวไล)

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14 Hydrogen Sulfide...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
14	Hydrogen Sulfide	Absorption Sampling, Iodometric Method <sup>[5]</sup>
15	Lead	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
16	Manganese	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
17	Mercury	Isokinetic Sampling, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>[5]</sup>
18	Nickel	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
19	Opacity	Ringelmann's Method <sup>[2]</sup>
20	Oxide of Nitrogen	1) Absorption Sampling, Ion Chromatographic Method <sup>[5]</sup> 2) Absorption Sampling, Phenoldisulfonic acid Method <sup>[5]</sup> 3) Instrumental Analyzer Method <sup>[5]</sup>
21	Selenium	1) Isokinetic Sampling, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
22	Sulfur dioxide	1) Isokinetic Sampling, Barium-Thorin Titrimetric Method <sup>[5]</sup> 2) Instrumental Analyzer Method <sup>[5]</sup>
23	Sulfuric acid	Isokinetic Sampling, Barium-Thorin Titrimetric Method <sup>[5]</sup>
24	Tin	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
25	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method <sup>[5]</sup>

26 Vanadium...

  
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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
26	Vanadium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
27	Xylene	1) Adsorption Sampling, Gas Chromatographic Method <sup>[5]</sup> 2) Adsorption Sampling, Gas Chromatographic/Mass Spectrometric Method <sup>[5]</sup>

## สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว จำนวน 34 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[1,9,22]</sup> 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,26]</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,26]</sup>
2	Antimony	1) Waste Extraction, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[1,6,16]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 3) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[7,16]</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
3	Arsenic	1) Waste Extraction, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[1,6,16]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 3) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[7,16]</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
4	Barium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>[1,6,15]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup>

  
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และทะเบียนห้องปฏิบัติการ

3) Digestion...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
5	Beryllium	3) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,15]</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
6	Cadmium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
7	Chlordane	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>[1,6,15]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 3) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,15]</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
8	Chromium	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[1,9,22]</sup> 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,26]</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,26]</sup>
9	Chromium (III)	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>[1,6,15]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 3) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,15]</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
		1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method; Waste Extraction, Colorimetric Method; Calculation Method <sup>[1,6,15,17]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction, Colorimetric Method; Calculation Method <sup>[1,6,16,17]</sup>

3) Digestion...

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
10	Chromium (VI)	3) Digestion, Flame Atomic Absorption Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method <sup>[7,8,15,17]</sup> 4) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method <sup>[7,8,14,17]</sup>
11	Cobalt	1) Waste Extraction, Colorimetric Method <sup>[1,17]</sup> 2) Alkaline Digestion, Colorimetric Method <sup>[8,17]</sup>
12	Copper	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
13	2,4-D	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>[1,6,15]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 3) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,15]</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
14	DDD	1) Waste Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,24]</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[24]</sup>
15	DDE	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[1,9,22]</sup> 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,26]</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,26]</sup>
		1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[1,9,22]</sup> 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,26]</sup>

3) Soxhlet...

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
16	DDT	3) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,26]</sup> 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[1,9,22]</sup> 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,26]</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,26]</sup>
17	Dieldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[1,9,22]</sup> 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,26]</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,26]</sup>
18	Endrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[1,9,22]</sup> 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,26]</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,26]</sup>
19	Heptachlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[1,9,22]</sup> 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,26]</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 4) Soxhlet...

4) Soxhlet...

(นางริกาญจน์ ฉัตรสกุลวิไล)

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
20	Lead	4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,26]</sup> 1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>[1,6,15]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 3) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,15]</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
21	Lindane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[1,9,22]</sup> 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,26]</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,26]</sup>
22	Mercury	1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>[1,18]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 3) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>[19]</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
23	Methoxychlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[1,9,22]</sup> 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,26]</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,22]</sup> 4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,26]</sup>
24	Molybdenum	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>

25 Nickel...

(นางริกาญจน์ ฉัตรสกุลวิไล)

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
25	Nickel	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>[1,6,15]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 3) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,15]</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
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 <sup>[1,9,23]</sup> 2) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,23]</sup>
27	Pentachlorophenol	1) Waste Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,24]</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[24]</sup>
28	pH	Electrometric Method <sup>[30,31]</sup>
29	Selenium	1) Waste Extraction, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[1,6,20]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 3) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[7,20]</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
30	Silver	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
31	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
32	Trichloroethylene	1) Waste Extraction, Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[1,12,25]</sup> 2) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[12,25]</sup>

วิมล  
(นางริกาญจน์ ฉัตรสกุลวิไล)

33 Vanadium...

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
33	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
34	Zinc	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>[1,6,15]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 3) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,15]</sup> 4) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>

## ดิน จำนวน 122 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,26]</sup>
2	Acetone	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[13,25]</sup>
3	Aldrin	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>[11,22]</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[11,26]</sup>
4	Anthracene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,26]</sup>
5	Antimony	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[7,16]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
6	Arsenic	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[7,16]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
7	Atrazine	Ultrasonic Extraction, Gas Chromatographic Method <sup>[11,22]</sup>
8	Barium	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,15]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>

วิมล

9 Benz(a)anthracene...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ  
และทะเบียนห้องปฏิบัติการ

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

27

27 Chlordane...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์มลพิษ  
และทะเบียนห้องปฏิบัติการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
27	Chlordane	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>[11,22]</sup> 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
28	p-Chloroaniline	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[13,25]</sup>
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[13,25]</sup>
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[13,25]</sup>
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[13,25]</sup>
32	2-Chlorophenol	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup>
33	Chromium	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,15]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
34	Chromium (III)	1) Digestion, Flame Atomic Absorption Spectrometric Method; Colorimetric Method; Calculation Method <sup>[7,8,15,17]</sup> 2) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation Method <sup>[7,8,14,17]</sup>
35	Chromium (VI)	Alkaline Digestion, Colorimetric Method <sup>[8,17]</sup>
36	Chrysene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup>
37	Cyanide	1) Extraction, Distillation, Titrimetric Method <sup>[27,28,29]</sup> 2) Extraction, Distillation, Colorimetric Method <sup>[27,28,29]</sup>
38	2,4-D	Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[24]</sup>
39	DDD	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>[11,22]</sup> 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
40	DDE	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>[11,22]</sup> 2) Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>

41

41 DDT...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์มลพิษ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
41	DDT	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>(11,22)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,26)</sup>
42	Dibenz(a,h)anthracene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,26)</sup>
43	Di-n-butyl phthalate	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,26)</sup>
44	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,25)</sup>
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,25)</sup>
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,25)</sup>
47	3,3'-Dichlorobenzidine	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,26)</sup>
48	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,25)</sup>
49	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,25)</sup>
50	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,25)</sup>
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,25)</sup>
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,25)</sup>
53	2,4-Dichlorophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,26)</sup>
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,25)</sup>
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,25)</sup>
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,25)</sup>



(นางริกาญจน์ จิตรสกุลวไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

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57 Dieldrin...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
57	Dieldrin	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>(11,22)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,26)</sup>
58	Diethyl phthalate	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,26)</sup>
59	2,4-Dimethylphenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,26)</sup>
60	2,4-Dinitrophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,26)</sup>
61	2,4-Dinitrotoluene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,26)</sup>
62	2,6-Dinitrotoluene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,26)</sup>
63	Di-n-Octyl phthalate	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,26)</sup>
64	Endosulfan	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>(11,22)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,26)</sup>
65	Endrin	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>(11,22)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,26)</sup>
66	Ethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(13,25)</sup>
67	Fluoranthene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,26)</sup>
68	Fluorene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(10,26)</sup>
69	Heptachlor	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>(11,22)</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(11,26)</sup>



(นางริกาญจน์ จิตรสกุลวไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

และทะเบียนห้องปฏิบัติการ

70 Heptachlor epoxide...



ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
70	Heptachlor epoxide	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>[11,22]</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[11,26]</sup>
71	Hexachlorobenzene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,26]</sup>
72	Hexachloro-1,3-butadiene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,26]</sup>
73	n-Hexane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[13,25]</sup>
74	$\alpha$ -HCH	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>[11,22]</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[11,26]</sup>
75	$\beta$ -HCH	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>[11,22]</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[11,26]</sup>
76	$\gamma$ -HCH	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>[11,22]</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[11,26]</sup>
77	Hexachlorocyclopentadiene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,26]</sup>
78	Hexachloroethane	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,26]</sup>
79	Indeno(1,2,3-cd)pyrene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,26]</sup>
80	Isophorone	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,26]</sup>
81	Lead	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,15]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
82	Manganese	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,15]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>



(นางริณญาณ์ จันทรกุลไชย)

ผู้อำนวยการศูนย์มาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

และทะเบียนห้องปฏิบัติการ

83 Mercury...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
83	Mercury	1) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>[19]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
84	Methanol	Ultrasonic Extraction, Direct Aqueous Injection, Gas Chromatographic Method <sup>[11,21]</sup>
85	Methoxychlor	1) Ultrasonic Extraction, Gas Chromatographic Method <sup>[11,22]</sup> 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[11,26]</sup>
86	Methyl bromide	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[13,25]</sup>
87	Methylene chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[13,25]</sup>
88	2-Methylphenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[11,26]</sup>
89	2-Methylnaphthalene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[11,26]</sup>
90	Methyl tert-butyl ether	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[13,25]</sup>
91	Naphthalene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,26]</sup>
92	Nickel	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,15]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
93	Nitrobenzene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,26]</sup>
94	N-Nitrosodiphenylamine	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,26]</sup>
95	Polychlorinated Biphenyls - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260	Soxhlet Extraction, Gas Chromatographic Method <sup>[10,23]</sup>



(นางริณญาณ์ จันทรกุลไชย)

ผู้อำนวยการศูนย์มาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

และทะเบียนห้องปฏิบัติการ

96 Pentachlorophenol...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
96	Pentachlorophenol	Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[24]</sup>
97	Phenanthrene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup>
98	Phenol	Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
99	Pyrene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup>
100	Selenium	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[7,20]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
101	Silver	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,15]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
102	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[13,25]</sup>
103	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[13,25]</sup>
104	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[13,25]</sup>
105	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[13,25]</sup>
106	TPH (C <sub>5</sub> -C <sub>8</sub> )	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[13,25]</sup>
107	TPH (C <sub>8</sub> -C <sub>16</sub> )	1) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,21]</sup> 2) Soxhlet Extraction, Gas Chromatographic/ Mass spectrometric Method <sup>[10,21]</sup>
108	TPH (C <sub>16</sub> -C <sub>35</sub> )	1) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,21]</sup> 2) Soxhlet Extraction, Gas Chromatographic/ Mass spectrometric Method <sup>[10,21]</sup>
109	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[13,25]</sup>
110	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[13,25]</sup>

(นางริกาญจน์ อัครสกุลวิไล)

ผู้อำนวยการศูนย์มาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

111 1,1,2-Trichloroethane...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
111	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[13,25]</sup>
112	Trichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[13,25]</sup>
113	2,4,5-Trichlorophenol	Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
114	2,4,6-Trichlorophenol	Ultrasonic Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
115	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[13,25]</sup>
116	Vanadium	Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
117	Vinyl chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[13,25]</sup>
118	m-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[13,25]</sup>
119	o-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[13,25]</sup>
120	p-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[13,25]</sup>
121	Xylene (Total)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[13,25]</sup>
122	Zinc	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,15]</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>

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วิภา

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วิภา

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ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ  
และทะเบียนห้องปฏิบัติการ

ภาคผนวก ข

ใบรับรองความสามารถห้องปฏิบัติการและขอขยาย  
การรับรองห้องปฏิบัติการทดสอบ ตาม ISO/IEC 17025  
จากสำนักงานมาตรฐานอุตสาหกรรม (สมอ.)



ใบรับรองเลขที่ 20T173/1151

## ใบรับรองห้องปฏิบัติการ

อาศัยอำนาจตามความในพระราชบัญญัติการมาตรฐานแห่งชาติ พ.ศ. ๒๕๕๑

เลขาธิการสำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม

ออกใบรับรองฉบับนี้ให้

บริษัท ชีคอฟ จำกัด

มีห้องปฏิบัติการตั้งอยู่เลขที่

239 ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพมหานคร

ได้รับการรับรองความสามารถห้องปฏิบัติการทดสอบ

ตามมาตรฐานเลขที่ มอก. 17025-2561 (ISO/IEC 17025 : 2017)

ข้อกำหนดทั่วไปว่าด้วยความสามารถห้องปฏิบัติการทดสอบและสอบเทียบ

หมายเลขการรับรองที่ ทดสอบ ๐๓๙๔

โดยมีสาขาการรับรองตามรายละเอียดแนบท้ายใบรับรอง

ตั้งแต่วันที่ ๙ กันยายน พ.ศ. ๒๕๖๓

ถึง วันที่ ๘ กันยายน พ.ศ. ๒๕๖๖

ออกให้ ณ วันที่ ๒๓ กันยายน ๒๕๖๓

(นายวีระกิตติ์ วันทกิจอนันต์)

รองเลขาธิการ ปฏิบัติราชการแทน

เลขาธิการสำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม



กระทรวงอุตสาหกรรม สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม

รายละเอียดแนบท้ายใบรับรองห้องปฏิบัติการทดสอบ

ใบรับรองเลขที่ 20T173/1151

ชื่อห้องปฏิบัติการ

ที่อยู่

หมายเลขการรับรองที่

สถานภาพห้องปฏิบัติการ

ห้องปฏิบัติการทดสอบ บริษัท ชีคอฟ จำกัด

239 ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพมหานคร

ทดสอบ 0394

☒ ถาวร ☐ นอกสถานที่ ☐ชั่วคราว ☐เคลื่อนที่

สาขาการทดสอบ	รายการทดสอบ	วิธีทดสอบ
สาขาล้างแวล้อม 1. น้ำและน้ำเสีย (water and wastewater)	<ul style="list-style-type: none"> <li>- Arsenic 0.000 5 mg/l to 0.090 0 mg/l</li> <li>- Arsenic 0.05 mg/l to 4.50 mg/l</li> <li>- Barium 0.02 mg/l to 4.50 mg/l</li> <li>- Cadmium 0.01 mg/l to 4.50 mg/l</li> <li>- Chromium 0.01 mg/l to 4.50 mg/l</li> <li>- Copper 0.02 mg/l to 4.50 mg/l</li> <li>- Iron 0.05 mg/l to 9.00 mg/l</li> <li>- Lead 0.03 mg/l to 4.50 mg/l</li> <li>- Manganese 0.01 mg/l to 9.00 mg/l</li> <li>- Nickel 0.01 mg/l to 4.50 mg/l</li> <li>- Zinc 0.02 mg/l to 9.00 mg/l</li> </ul>	<ul style="list-style-type: none"> <li>- Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WEF, 23<sup>rd</sup> edition, 2017, Part 3030 F and Part 3114 C</li> <li>- Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WEF, 23<sup>rd</sup> edition, 2017, Part 3030 E and Part 3120 B</li> </ul>

ฉบับที่ 1 ตั้งแต่วันที่ 9 กันยายน 2563

หน้า 1/5

กระทรวงอุตสาหกรรม สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม

รายละเอียดแนบท้ายใบรับรองห้องปฏิบัติการทดสอบ

ใบรับรองเลขที่ 20T173/1151

หมายเลขการรับรองที่ ทดสอบ 0394

สถานภาพห้องปฏิบัติการ ☒ถาวร ☐นอกสถานที่ ☐ชั่วคราว ☐เคลื่อนที่

สาขาการทดสอบ	รายการทดสอบ	วิธีทดสอบ
สาขาส่งแวดล้อม		
1. น้ำและน้ำเสีย (ต่อ) (water and wastewater) (cont.)	- COD 100 mg/l to 4 000 mg/l	- Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WEF, 23 <sup>rd</sup> edition, 2017, Part 5220 D
2. คุณภาพอากาศ (air quality)		
2.1 บริเวณทำงาน (workplace)	- Total dust 0.10 mg/filter to 2.00 mg/filter  - Respirable dust 0.10 mg/filter to 2.00 mg/filter  - Benzene 1.10 µg/tube to 420 µg/tube  - Toluene 1.10 µg/tube to 420 µg/tube  - Total xylenes 2.20 µg/tube to 840 µg/tube • m,p-xylene 1.10 µg/tube to 420 µg/tube • o-xylene 1.10 µg/tube to 420 µg/tube	- NIOSH Manual of Analytical Methods (NMAM), method 0500, 4 <sup>th</sup> edition, 15 <sup>th</sup> August 1994 (Exclude Sampling)  - NIOSH Manual of Analytical Method(NMAM), method 0600, 4 <sup>th</sup> edition, 15 <sup>th</sup> January 1998 (Exclude Sampling)  - NIOSH Manual of Analytical Methods (NMAM) , method 1501, 4 <sup>th</sup> edition, 15 <sup>th</sup> March 2003 (Exclude Sampling)

ฉบับที่ 1 ตั้งแต่วันที่ 9 กันยายน 2563

หน้า 2/5

กระทรวงอุตสาหกรรม สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม

รายละเอียดแนบท้ายใบรับรองห้องปฏิบัติการทดสอบ

ใบรับรองเลขที่ 20T173/1151

หมายเลขการรับรองที่ ทดสอบ 0394

สถานภาพห้องปฏิบัติการ ☒ถาวร ☐นอกสถานที่ ☐ชั่วคราว ☐เคลื่อนที่

สาขาการทดสอบ	รายการทดสอบ	วิธีทดสอบ
สาขาส่งแวดล้อม		
2. คุณภาพอากาศ (ต่อ) (air quality) (cont.)		
2.2 อากาศในปล่องระบาย อากาศ (stack)	- Sulfur dioxide 1.00 mg/L to 16 000 mg/L (solution)	- US.EPA , Code of Federal Regulations, 40 CFR 60 appendix A, Method 6, July 2019 (Exclude Sampling)
2.3 บรรยากาศทั่วไป (ambient air)	- Hydrogen fluoride 5 µg/sample to 400 µg/sample  - Hydrogen chloride 5 µg/sample to 400 µg/sample  - Volatile organic compounds (VOCs) • Chloroethene 0.05 µg/m <sup>3</sup> to 51.00 µg/m <sup>3</sup> • 1,3 - butadiene 0.04 µg/m <sup>3</sup> to 44.00 µg/m <sup>3</sup> • Bromomethane 0.08 µg/m <sup>3</sup> to 77.00 µg/m <sup>3</sup> • Acrolein 0.05 µg/m <sup>3</sup> to 45.00 µg/m <sup>3</sup> • Acrylonitrile 0.04 µg/m <sup>3</sup> to 43.00 µg/m <sup>3</sup> • Dichloromethane 0.14 µg/m <sup>3</sup> to 69.00 µg/m <sup>3</sup> • Carbon disulfide 0.06 µg/m <sup>3</sup> to 62.00 µg/m <sup>3</sup> • Trichloromethane 0.20 µg/m <sup>3</sup> to 97.00 µg/m <sup>3</sup>	- In-house method : WI-7.2-1-22 based on US.EPA, Code of Federal Regulations, 40 CFR 60 appendix A Method 26, 2019 (Exclude Sampling)  - In-house method :WI-7.2-1-24 based on US.EPA , Compendium Method TO - 15, EPA / 625 / R-96 / 010b, January 1999 (Include sampling)

ฉบับที่ 1 ตั้งแต่วันที่ 9 กันยายน 2563

หน้า 3/5

กระทรวงอุตสาหกรรม สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม

รายละเอียดแนบท้ายใบรับรองห้องปฏิบัติการทดสอบ  
ใบรับรองเลขที่ 20T173/1151

หมายเลขการรับรองที่ ทดสอบ 0394  
สถานภาพห้องปฏิบัติการ ☒ ถาวร ☐ นอกสถานที่ ☐ชั่วคราว ☐เคลื่อนที่


สาขาการทดสอบ	รายการทดสอบ	วิธีทดสอบ
<p>สาขาสิ่งแวดล้อม</p> <p>2. คุณภาพอากาศ (ต่อ) (air quality) (cont.)</p> <p>2.3 บรรยากาศทั่วไป (ต่อ) (ambient air) (cont.)</p>	<p>- Volatile organic compounds (VOCs) (cont.)</p> <ul style="list-style-type: none"> <li>1,2 - dichloroethane 0.08 <math>\mu\text{g}/\text{m}^3</math> to 80.00 <math>\mu\text{g}/\text{m}^3</math></li> <li>Benzene 0.06 <math>\mu\text{g}/\text{m}^3</math> to 63.00 <math>\mu\text{g}/\text{m}^3</math></li> <li>Carbon tetrachloride 0.25 <math>\mu\text{g}/\text{m}^3</math> to 125 <math>\mu\text{g}/\text{m}^3</math></li> <li>Trichloroethylene 0.21 <math>\mu\text{g}/\text{m}^3</math> to 107 <math>\mu\text{g}/\text{m}^3</math></li> <li>1,2 - dichloropropane 0.18 <math>\mu\text{g}/\text{m}^3</math> to 92.00 <math>\mu\text{g}/\text{m}^3</math></li> <li>Tetrachloroethylene 0.27 <math>\mu\text{g}/\text{m}^3</math> to 135 <math>\mu\text{g}/\text{m}^3</math></li> <li>1,2 - dibromoethane 0.31 <math>\mu\text{g}/\text{m}^3</math> to 153 <math>\mu\text{g}/\text{m}^3</math></li> <li>1,1,2,2 - tetrachloroethane 0.69 <math>\mu\text{g}/\text{m}^3</math> to 137 <math>\mu\text{g}/\text{m}^3</math></li> </ul>	<p>- In-house method :WI-7.2-1-24 US.EPA , Compendium Method TO - 15, EPA / 625 / R-96 / 010b, January 1999 (Include sampling)</p>

รายละเอียดแนบท้ายใบรับรองห้องปฏิบัติการทดสอบ  
ใบรับรองเลขที่ 20T173/1151

หมายเลขการรับรองที่ ทดสอบ 0394  
สถานภาพห้องปฏิบัติการ ☒ ถาวร ☐ นอกสถานที่ ☐ชั่วคราว ☐เคลื่อนที่

สาขาการทดสอบ	รายการทดสอบ	วิธีทดสอบ
<p>สาขาสิ่งแวดล้อม</p> <p>2. คุณภาพอากาศ (ต่อ) (air quality) (cont.)</p> <p>2.3 บรรยากาศทั่วไป (ต่อ) (ambient air) (cont.)</p>	<p>- Volatile organic compounds (VOCs) (cont.)</p> <ul style="list-style-type: none"> <li>Benzyl chloride 0.52 <math>\mu\text{g}/\text{m}^3</math> to 103 <math>\mu\text{g}/\text{m}^3</math></li> <li>1,4 - dichlorobenzene 0.24 <math>\mu\text{g}/\text{m}^3</math> to 120 <math>\mu\text{g}/\text{m}^3</math></li> </ul>	<p>- In-house method :WI-7.2-1-24 US.EPA , Compendium Method TO - 15, EPA / 625 / R-96 / 010b, January 1999 (Include sampling)</p>

ออกให้ ณ วันที่ ๑3 กันยายน ๒๕๖3

  
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