

ภาคผนวก ค

ใบรับรองผลการตรวจวิเคราะห์คุณภาพสิ่งแวดล้อม

ภาคผนวก ค-1

คุณภาพอากาศในบรรยากาศ



Analysis / Test Report



TESTING
No.0042

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595451

Date Received : Oct 29, 2025

Date Reported : Nov 04, 2025

Report Number : 3427230-1C6

Page 1 of 1

Sample Description	Air Quality				
Location	โรงเรียนบ้านสุรศักดิ์ (GPS 47P 0735497, 1445317)				
Date Analysis Commenced	Oct 30, 2025				
Condition of Sample	Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one quartz filter paper (8x10 inch) placed in plastic bag				

Sample Number	Sampled Date	Sampling Condition		Total Suspended Particulate (mg/m3)	Particulate Matter (PM-10) (mg/m3)
		Pressure (mm Hg)	Temperature (°C)		
2595451-1	Oct 20 - Oct 21, 2025	755	30.1	0.040	0.020
2595451-2	Oct 21 - Oct 22, 2025	755	30.3	0.035	0.016
2595451-3	Oct 22 - Oct 23, 2025	755	29.8	0.030	0.011
2595451-4	Oct 23 - Oct 24, 2025	755	30.1	0.037	0.013
2595451-5	Oct 24 - Oct 25, 2025	755	31.2	0.028	0.012
2595451-6	Oct 25 - Oct 26, 2025	755	31.1	0.024	0.016
2595451-7	Oct 26 - Oct 27, 2025	755	30.9	0.020	0.016
Guideline	-	-	-	0.33	0.12

Reference Method

Total Suspended Particulate : United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008

Particulate Matter (PM-10) : United States Environmental Protection Agency 40 CFR, method 50, Appendix J, revised as of July 1, 2008

Guideline : Notification of the National Environmental Board. No.24, 2004 (B.E.2547) dated September 22, 2004

Sampled By : Anurak Tongkhajonsakda

Approved by

Thanita K.

Thanita Kulsuriwong
Scientist (4)

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

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Analysis / Test Report



TESTING
No.0042

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595451

Date Received : Oct 29, 2025

Date Reported : Nov 04, 2025

Report Number : 3427230-2C6

Page 1 of 1

Sample Description	Air Quality				
Location	โรงเรียนชุมชนวัดหน้าศาลออก (GPS 47P 0738199, 1443916)				
Date Analysis Commenced	Oct 30, 2025				
Condition of Sample	Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one quartz filter paper (8x10 inch) placed in plastic bag				

Sample Number	Sampled Date	Sampling Condition		Total Suspended Particulate (mg/m3)	Particulate Matter (PM-10) (mg/m3)
		Pressure (mm Hg)	Temperature (°C)		
2595451-8	Oct 20 - Oct 21, 2025	755	30.1	0.038	0.027
2595451-9	Oct 21 - Oct 22, 2025	755	30.3	0.028	0.023
2595451-10	Oct 22 - Oct 23, 2025	755	29.8	0.026	0.015
2595451-11	Oct 23 - Oct 24, 2025	755	30.1	0.030	0.017
2595451-12	Oct 24 - Oct 25, 2025	755	31.2	0.027	0.015
2595451-13	Oct 25 - Oct 26, 2025	755	31.1	0.030	0.022
2595451-14	Oct 26 - Oct 27, 2025	755	30.9	0.031	0.022
Guideline	-	-	-	0.33	0.12

Reference Method

Total Suspended Particulate : United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008

Particulate Matter (PM-10) : United States Environmental Protection Agency 40 CFR, method 50, Appendix J, revised as of July 1, 2008

Guideline : Notification of the National Environmental Board. No.24, 2004 (B.E.2547) dated September 22, 2004

Sampled By : Anurak Tongkhajonsakda

Approved by

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No.0042

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595451

Date Received : Oct 29, 2025

Date Reported : Nov 04, 2025

Report Number : 3427230-3C6

Page 1 of 1

Sample Description	Air Quality
Location	โรงเรือนป่านระเว้ง (ราชพฤกษ์ปิ่นมณี) (GPS 47P 0739512, 1447941)
Date Analysis Commenced	Oct 30, 2025
Condition of Sample	Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one quartz filter paper (8x10 inch) placed in plastic bag

Sample Number	Sampled Date	Sampling Condition		Total Suspended Particulate (mg/m3)	Particulate Matter (PM-10) (mg/m3)
		Pressure (mm Hg)	Temperature (°C)		
2595451-15	Oct 20 - Oct 21, 2025	755	30.1	0.063	0.030
2595451-16	Oct 21 - Oct 22, 2025	755	30.3	0.095	0.041
2595451-17	Oct 22 - Oct 23, 2025	755	29.8	0.055	0.027
2595451-18	Oct 23 - Oct 24, 2025	755	30.1	0.051	0.023
2595451-19	Oct 24 - Oct 25, 2025	755	31.2	0.046	0.022
2595451-20	Oct 25 - Oct 26, 2025	755	31.1	0.071	0.037
2595451-21	Oct 26 - Oct 27, 2025	755	30.9	0.047	0.027
Guideline	-	-	-	0.33	0.12

Reference Method

Total Suspended Particulate : United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008

Particulate Matter (PM-10) : United States Environmental Protection Agency 40 CFR, method 50, Appendix J, revised as of July 1, 2008

Guideline : Notification of the National Environmental Board. No.24, 2004 (B.E.2547) dated September 22, 2004

Sampled By : Anurak Tongkhajonsakda

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Analysis / Test Report



TESTING
No.0042

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595451

Date Received : Oct 29, 2025

Date Reported : Nov 04, 2025

Report Number : 3427230-4C6

Page 1 of 1

Sample Description	Air Quality
Location	วัดจอมพลเจ้าพระยา (GPS 47P 0738170, 1442937)
Date Analysis Commenced	Oct 30, 2025
Condition of Sample	Drawn into one glass filter paper (8x10 inch) placed in plastic bag and one quartz filter paper (8x10 inch) placed in plastic bag

Sample Number	Sampled Date	Sampling Condition		Total Suspended Particulate (mg/m3)	Particulate Matter (PM-10) (mg/m3)
		Pressure (mm Hg)	Temperature (°C)		
2595451-22	Oct 20 - Oct 21, 2025	755	30.1	0.031	0.022
2595451-23	Oct 21 - Oct 22, 2025	755	30.3	0.032	0.020
2595451-24	Oct 22 - Oct 23, 2025	755	29.8	0.032	0.016
2595451-25	Oct 23 - Oct 24, 2025	755	30.1	0.036	0.018
2595451-26	Oct 24 - Oct 25, 2025	755	31.2	0.033	0.019
2595451-27	Oct 25 - Oct 26, 2025	755	30.1	0.034	0.020
2595451-28	Oct 26 - Oct 27, 2025	755	30.9	0.029	0.020
Guideline	-	-	-	0.33	0.12

Reference Method

Total Suspended Particulate : United States Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008

Particulate Matter (PM-10) : United States Environmental Protection Agency 40 CFR, method 50, Appendix J, revised as of July 1, 2008

Guideline : Notification of the National Environmental Board. No.24, 2004 (B.E.2547) dated September 22, 2004

Sampled By : Anurak Tongkhajonsakda

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140

P/O : GTS4-4210500514

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595448

Date Received : Oct 29, 2025

Date Reported : Nov 04, 2025

Report Number: 3427177-1C6

Page 1 of 1

Sample Description Air Quality
Location โรงเรียนบ้านสุรศักดิ์ (GPS 47P 0735497, 1445317)
Parameter Nitrogen dioxide (ppm)
Measurement Date Oct 20, 2025 - Oct 27, 2025
Measurement by Anurak Tongkhajonsakda

Time	2595448-1 Oct 20, 2025	2595448-2 Oct 21, 2025	2595448-3 Oct 22, 2025	2595448-4 Oct 23, 2025	2595448-5 Oct 24, 2025	2595448-6 Oct 25, 2025	2595448-7 Oct 26, 2025
11:00 AM - 12:00 PM	0.0020	0.0026	0.0029	0.0023	0.0036	0.0023	0.0016
12:00 PM - 01:00 PM	0.0011	0.0015	0.0036	0.0022	0.0021	0.0031	0.0018
01:00 PM - 02:00 PM	0.0016	0.0031	0.0038	0.0031	0.0023	0.0017	0.0015
02:00 PM - 03:00 PM	0.0016	0.0019	0.0027	0.0051	0.0025	0.0015	0.0018
03:00 PM - 04:00 PM	0.0017	0.0026	0.0045	0.0044	0.0020	0.0023	0.0019
04:00 PM - 05:00 PM	0.0024	0.0018	0.0025	0.0024	0.0029	0.0020	0.0020
05:00 PM - 06:00 PM	0.0016	0.0022	0.0028	0.0020	0.0038	0.0019	0.0015
06:00 PM - 07:00 PM	0.0017	0.0022	0.0020	0.0019	0.0034	0.0063	0.0016
07:00 PM - 08:00 PM	0.0019	0.0019	0.0016	0.0017	0.0026	0.0064	0.0016
08:00 PM - 09:00 PM	0.0020	0.0019	0.0022	0.0021	0.0018	0.0031	0.0019
09:00 PM - 10:00 PM	0.0018	0.0020	0.0022	0.0042	0.0019	0.0020	0.0018
10:00 PM - 11:00 PM	0.0020	0.0021	0.0021	0.0045	0.0019	0.0020	0.0023
11:00 PM - 12:00 AM	0.0023	0.0022	0.0022	0.0064	0.0020	0.0022	0.0044
12:00 AM - 01:00 AM	0.0027	0.0029	0.0028	0.0070	0.0020	0.0023	0.0029
01:00 AM - 02:00 AM	0.0036	0.0018	0.0052	0.0057	0.0039	0.0029	0.0037
02:00 AM - 03:00 AM	0.0048	0.0030	0.0032	0.0034	0.0024	0.0041	0.0030
03:00 AM - 04:00 AM	0.0020	0.0026	0.0020	0.0038	0.0016	0.0026	0.0016
04:00 AM - 05:00 AM	0.0020	0.0024	0.0023	0.0031	0.0013	0.0044	0.0016
05:00 AM - 06:00 AM	0.0019	0.0022	0.0015	0.0020	0.0013	0.0022	0.0022
06:00 AM - 07:00 AM	0.0020	0.0021	0.0016	0.0031	0.0016	0.0018	0.0018
07:00 AM - 08:00 AM	0.0014	0.0028	0.0017	0.0014	0.0016	0.0021	0.0015
08:00 AM - 09:00 AM	0.0013	0.0032	0.0017	0.0015	0.0023	0.0019	0.0014
09:00 AM - 10:00 AM	0.0013	0.0028	0.0018	0.0018	0.0014	0.0024	0.0015
10:00 AM - 11:00 AM	0.0015	0.0036	0.0021	0.0028	0.0026	0.0018	0.0013
Average	0.0020	0.0024	0.0025	0.0032	0.0023	0.0027	0.0020
1hr - Maximum	0.0048	0.0036	0.0052	0.0070	0.0039	0.0064	0.0044
Standard 1hr - Average	0.170	0.170	0.170	0.170	0.170	0.170	0.170

Standard : Notification of the National Environment Board No. 33, 2009 (B.E. 2552).

Reference Method : U.S. Environmental Protection Agency Method Part 50 App. F (Chemiluminescence)

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Approved by

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140

P/O : GTS4-4210500514

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595448

Date Received : Oct 29, 2025

Date Reported : Nov 04, 2025

Report Number: 3442217-1C6

Page 1 of 1

Sample Description Air Quality
Location โรงเรียนชุมชนวัดหน้าศาลตะวันออก (GPS 47P 073) 199, 1443916x
Parameter Nitrogen dioxide (ppm)
Measurement Date Oct 20, 2025 - Oct 27, 2025
Measurement by Anurak Tongkhajonsakda

Time	259544(-) Oct 20, 2025	259544(-) 9 Oct 21, 2025	259544(-) 10 Oct 22, 2025	259544(-) 11 Oct 23, 2025	259544(-) 12 Oct 24, 2025	259544(-) 13 Oct 25, 2025	259544(-) 14 Oct 26, 2025
10:00 AM - 11:00 AM	0.0017	0.001	0.0012	0.0016	0.0010	0.0010	0.0011
11:00 AM - 12:00 PM	0.0015	0.001	0.0013	0.0011	0.0010	0.0011	0.0010
12:00 PM - 01:00 PM	0.0013	0.0015	0.0013	0.0012	0.0011	0.0011	0.0010
01:00 PM - 02:00 PM	0.0012	0.0013	0.0013	0.0011	0.0010	0.0011	0.0010
02:00 PM - 03:00 PM	0.0013	0.0013	0.0012	0.0011	0.0010	0.0012	0.0011
03:00 PM - 04:00 PM	0.0012	0.0013	0.0012	0.0010	0.0011	0.0014	0.0011
04:00 PM - 05:00 PM	0.0013	0.0013	0.0011	0.0010	0.0011	0.0020	0.0012
05:00 PM - 06:00 PM	0.0013	0.0013	0.0012	0.0010	0.0011	0.0017	0.0011
06:00 PM - 07:00 PM	0.0013	0.0016	0.0012	0.0010	0.0011	0.0016	0.0010
07:00 PM - 08:00 PM	0.0015	0.0040	0.0012	0.0011	0.0011	0.0020	0.0011
08:00 PM - 09:00 PM	0.0017	0.0074	0.0013	0.0011	0.0010	0.0023	0.0017
09:00 PM - 10:00 PM	0.0019	0.004	0.0019	0.0012	0.0010	0.0027	0.0023
10:00 PM - 11:00 PM	0.0025	0.0061	0.0036	0.0011	0.001	0.0032	0.002
11:00 PM - 12:00 AM	0.0035	0.0061	0.0024	0.0010	0.0019	0.0029	0.0032
12:00 AM - 01:00 AM	0.0042	0.0075	0.0035	0.001	0.0025	0.0030	0.0031
01:00 AM - 02:00 AM	0.0042	0.0049	0.0032	0.0033	0.0026	0.0034	0.0034
02:00 AM - 03:00 AM	0.0047	0.004	0.002	0.0024	0.002	0.0029	0.0034
03:00 AM - 04:00 AM	0.0054	0.0043	0.0035	0.0025	0.0029	0.0031	0.0049
04:00 AM - 05:00 AM	0.0061	0.0045	0.0059	0.0034	0.0047	0.002	0.003
05:00 AM - 06:00 AM	0.0066	0.0067	0.0091	0.0061	0.001	0.0042	0.009
06:00 AM - 07:00 AM	0.0136	0.0117	0.0115	0.0039	0.0103	0.0096	0.0055
07:00 AM - 08:00 AM	0.0031	0.003	0.0046	0.001	0.0025	0.0074	0.0021
08:00 AM - 09:00 AM	0.0019	0.001	0.002	0.001	0.0014	0.0024	0.0014
09:00 AM - 10:00 AM	0.001	0.0016	0.0015	0.0012	0.0012	0.0014	0.0011
Average	0.0031	0.0040	0.0029	0.001	0.0023	0.0027	0.0024
1hr - Maximum	0.0136	0.0117	0.0115	0.0061	0.0103	0.0096	0.009
Standard 1hr - Average	0.170	0.170	0.170	0.170	0.170	0.170	0.170

Standard : Notification of the National Environment Board No. 33, 2009 (B.E. 2552x).

Reference Method : U.S. Environmental Protection Agency Method Part 50 App. F (Chemiluminescence)

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Approved by

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140

P/O : GTS4-4210500514

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595448

Date Received : Oct 29, 2025

Date Reported : Nov 04, 2025

Report Number: 3442217-1C6

Page 1 of 1

Sample Description Air Quality
Location โรงเรียนบ้านระเวิง (ราชพฤกษ์ปิ่นมณี) (GPS 4xP 0x39512, 144x941)
Parameter Nitrogen dioxide (ppm)
Measurement Date Oct 20, 2025 - Oct 2x, 2025
Measurement by Anurak Tongkhaensakda

Time	2595447-15 Oct 20, 2025	2595447-16 Oct 21, 2025	2595447-1x Oct 22, 2025	2595447-17 Oct 23, 2025	2595447-19 Oct 24, 2025	2595447-20 Oct 25, 2025	2595447-21 Oct 26, 2025
12:00 PM - 01:00 PM	0.0014	0.00x4	0.0050	0.0020	0.0022	0.0142	0.0061
01:00 PM - 02:00 PM	0.0072	0.00x3	0.0107	0.0019	0.0114	0.0127	0.00x1
02:00 PM - 03:00 PM	0.00x2	0.009x	0.0096	0.0015	0.0123	0.0152	0.0112
03:00 PM - 04:00 PM	0.0096	0.0106	0.0071	0.0017	0.015x	0.0134	0.0101
04:00 PM - 05:00 PM	0.0097	0.0096	0.007x	0.0025	0.0124	0.0100	0.0072
05:00 PM - 06:00 PM	0.0091	0.0065	0.0064	0.0026	0.0093	0.0093	0.0096
06:00 PM - 0x:00 PM	0.0096	0.0059	0.0090	0.0026	0.0072	0.0075	0.00x4
0x:00 PM - 07:00 PM	0.0092	0.00x5	0.0065	0.0037	0.00xx	0.0072	0.0067
07:00 PM - 09:00 PM	0.0073	0.00x5	0.0054	0.0051	0.00x5	0.0099	0.00x5
09:00 PM - 10:00 PM	0.010x	0.0062	0.006x	0.0034	0.00x6	0.0146	0.0063
10:00 PM - 11:00 PM	0.0122	0.0063	0.00x6	0.0036	0.0073	0.0134	0.004x
11:00 PM - 12:00 AM	0.0075	0.007x	0.0100	0.0029	0.0072	0.0140	0.0049
12:00 AM - 01:00 AM	0.0117	0.0119	0.0103	0.0032	0.0153	0.0123	0.0060
01:00 AM - 02:00 AM	0.0110	0.00x4	0.0130	0.0029	0.0164	0.0113	0.0055
02:00 AM - 03:00 AM	0.0075	0.0090	0.0125	0.0024	0.0149	0.010x	0.005x
03:00 AM - 04:00 AM	0.0071	0.007x	0.0101	0.0030	0.0130	0.0121	0.00x3
04:00 AM - 05:00 AM	0.0103	0.0100	0.0100	0.0044	0.0112	0.0095	0.00x3
05:00 AM - 06:00 AM	0.0101	0.0092	0.0105	0.0043	0.0123	0.0095	0.0102
06:00 AM - 0x:00 AM	0.0116	0.0102	0.0070	0.0043	0.0113	0.0114	0.0125
0x:00 AM - 07:00 AM	0.0096	0.0096	0.0112	0.0037	0.0149	0.0103	0.0122
07:00 AM - 09:00 AM	0.0109	0.0092	0.0107	0.003x	0.0133	0.0144	0.00x7
09:00 AM - 10:00 AM	0.0114	0.0066	0.00x7	0.005x	0.0156	0.011x	0.00xx
10:00 AM - 11:00 AM	0.0116	0.0067	0.0095	0.0031	0.0144	0.0103	0.009x
11:00 AM - 12:00 PM	0.0070	0.0050	0.0105	0.002x	0.0121	0.0130	0.0074
Average	0.0094	0.0072	0.0091	0.0032	0.0115	0.011x	0.00x9
1hr - Maj imum	0.0122	0.0119	0.0130	0.005x	0.0164	0.0152	0.0125
Standard 1hr - Average	0.1x0	0.1x0	0.1x0	0.1x0	0.1x0	0.1x0	0.1x0

Standard : Notification of the National Environment Board No. 33, 2009 (B.E. 2552).

Reference Method : U.S. Environmental Protection Agency Method Part 50 App. F (Chemiluminescence)

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Thailand 21140

P/O : GTS4-4210500514

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595448

Date Received : Oct 29, 2025

Date Reported : Nov 04, 2025

Report Number: 3442220-1C7

Page 1 of 1

Sample Description Air Quality
Location วัดจอมพลเจ้าพระยา GPS 4(P 0(3)1(0, 144293(x
Parameter Nitrogen dioxide (ppm)
Measurement Date Oct 20, 2025 - Oct 2(, 2025
Measurement by Anurak Tongkhaensakda

Time	259544(-)22 Oct 20, 2025	259544(-)23 Oct 21, 2025	259544(-)24 Oct 22, 2025	259544(-)25 Oct 23, 2025	259544(-)27 Oct 24, 2025	259544(-)2((x Oct 25, 2025	259544(-)2 (x Oct 27, 2025
09:00 AM - 10:00 AM	0.002(	0.0034	0.0024	0.0033	0.0025	0.0039	0.0037
10:00 AM - 11:00 AM	0.002(	0.0037	0.002(	0.0035	0.0027	0.0039	0.0034
11:00 AM - 12:00 PM	0.0037	0.0045	0.0035	0.004(	0.0031	0.0039	0.003(
12:00 PM - 01:00 PM	0.0071	0.0053	0.0049	0.0044	0.0041	0.003(	0.003(
01:00 PM - 02:00 PM	0.0051	0.0074	0.003(	0.003(	0.0049	0.0049	0.0039
02:00 PM - 03:00 PM	0.003(	0.0059	0.0032	0.002(	0.003(	0.0059	0.003(
03:00 PM - 04:00 PM	0.0032	0.0040	0.0029	0.0031	0.0032	0.0037	0.0035
04:00 PM - 05:00 PM	0.003(	0.0037	0.002(	0.0033	0.003(	0.0035	0.0033
05:00 PM - 07:00 PM	0.003(	0.0039	0.0023	0.0025	0.0031	0.0034	0.0034
07:00 PM - 0(:00 PM	0.003(	0.0043	0.0035	0.0021	0.0033	0.0043	0.0031
0(:00 PM - 0) :00 PM	0.0024	0.003(	0.002(	0.0023	0.002(	0.0034	0.0031
0) :00 PM - 09:00 PM	0.0033	0.003(	0.0024	0.002(	0.0022	0.0033	0.0034
09:00 PM - 10:00 PM	0.0034	0.0031	0.0029	0.0020	0.0024	0.0034	0.0032
10:00 PM - 11:00 PM	0.0041	0.002(	0.0021	0.0019	0.002(	0.0042	0.0033
11:00 PM - 12:00 AM	0.003(	0.0025	0.0023	0.0015	0.0027	0.0035	0.0032
12:00 AM - 01:00 AM	0.003(	0.002(	0.0044	0.0021	0.002(	0.0037	0.0031
01:00 AM - 02:00 AM	0.003(	0.0027	0.0043	0.0022	0.0027	0.0037	0.0032
02:00 AM - 03:00 AM	0.0053	0.0041	0.0051	0.0039	0.0033	0.0032	0.0042
03:00 AM - 04:00 AM	0.002(	0.0031	0.0075	0.0037	0.003(	0.0037	0.0039
04:00 AM - 05:00 AM	0.0037	0.002(	0.0044	0.0025	0.0042	0.004(	0.0037
05:00 AM - 07:00 AM	0.002(	0.0029	0.0027	0.0025	0.0029	0.0053	0.003(
07:00 AM - 0(:00 AM	0.002(	0.002(	0.002(	0.0031	0.002(	0.0040	0.0051
0(:00 AM - 0) :00 AM	0.002(	0.0025	0.0031	0.0033	0.002(	0.003(	0.0040
0) :00 AM - 09:00 AM	0.0030	0.002(	0.0031	0.005(	0.0030	0.003(	0.0037
Average	0.0037	0.0037	0.0034	0.0030	0.0031	0.0039	0.0037
1hr - Maj imum	0.0071	0.0074	0.0075	0.005(	0.0049	0.0059	0.0051
Standard 1hr - Average	0.1(0	0.1(0	0.1(0	0.1(0	0.1(0	0.1(0	0.1(0

Standard : Notification of the National Environment Board No. 33, 2009 (B.E. 2552).

Reference Method : U.S. Environmental Protection Agency Method Part 50 App. F (Chemiluminescence)

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Life Sciences

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13430-61/ EMAIL



Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140

P/O : GTS4-4210500514

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595449

Date Received : Oct 29, 2025

Date Reported : Nov 04, 2025

Report Number: 3427192-1C6

Page 1 of 1

Sample Description	Air Quality						
Location	โรงเรียนบ้านสุรศักดิ์ (GPS 47P 0735497, 1445317)						
Parameter	Sulfur Dioxide (ppm)						
Measurement Date	Oct 20, 2025 - Oct 27, 2025						
Measurement by	Anurak Tongkhajonsakda						
	2595449-1 Oct 20, 2025	2595449-2 Oct 21, 2025	2595449-3 Oct 22, 2025	2595449-4 Oct 23, 2025	2595449-5 Oct 24, 2025	2595449-6 Oct 25, 2025	2595449-7 Oct 26, 2025
Time							
11:00 AM - 12:00 PM	0.0025	0.0028	0.0026	0.0026	0.0026	0.0026	0.0026
12:00 PM - 01:00 PM	0.0032	0.0027	0.0026	0.0026	0.0026	0.0026	0.0026
01:00 PM - 02:00 PM	0.0030	0.0027	0.0026	0.0026	0.0026	0.0026	0.0026
02:00 PM - 03:00 PM	0.0030	0.0027	0.0026	0.0026	0.0026	0.0026	0.0026
03:00 PM - 04:00 PM	0.0030	0.0026	0.0026	0.0026	0.0026	0.0026	0.0026
04:00 PM - 05:00 PM	0.0029	0.0026	0.0026	0.0027	0.0026	0.0027	0.0026
05:00 PM - 06:00 PM	0.0030	0.0026	0.0026	0.0026	0.0026	0.0026	0.0027
06:00 PM - 07:00 PM	0.0030	0.0027	0.0026	0.0026	0.0026	0.0027	0.0026
07:00 PM - 08:00 PM	0.0030	0.0027	0.0027	0.0026	0.0027	0.0026	0.0026
08:00 PM - 09:00 PM	0.0030	0.0027	0.0026	0.0027	0.0027	0.0026	0.0027
09:00 PM - 10:00 PM	0.0030	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027
10:00 PM - 11:00 PM	0.0029	0.0028	0.0026	0.0027	0.0027	0.0027	0.0027
11:00 PM - 12:00 AM	0.0029	0.0028	0.0027	0.0027	0.0027	0.0027	0.0027
12:00 AM - 01:00 AM	0.0029	0.0028	0.0027	0.0027	0.0027	0.0027	0.0026
01:00 AM - 02:00 AM	0.0029	0.0027	0.0027	0.0027	0.0027	0.0026	0.0027
02:00 AM - 03:00 AM	0.0029	0.0027	0.0027	0.0027	0.0027	0.0027	0.0027
03:00 AM - 04:00 AM	0.0029	0.0027	0.0028	0.0027	0.0026	0.0027	0.0027
04:00 AM - 05:00 AM	0.0029	0.0027	0.0027	0.0026	0.0027	0.0026	0.0027
05:00 AM - 06:00 AM	0.0029	0.0027	0.0027	0.0026	0.0026	0.0028	0.0027
06:00 AM - 07:00 AM	0.0028	0.0027	0.0027	0.0027	0.0026	0.0027	0.0028
07:00 AM - 08:00 AM	0.0028	0.0027	0.0027	0.0027	0.0026	0.0028	0.0027
08:00 AM - 09:00 AM	0.0029	0.0027	0.0028	0.0027	0.0027	0.0027	0.0028
09:00 AM - 10:00 AM	0.0028	0.0027	0.0027	0.0026	0.0027	0.0027	0.0027
10:00 AM - 11:00 AM	0.0027	0.0027	0.0027	0.0026	0.0027	0.0026	0.0027
Average	0.0029	0.0027	0.0027	0.0026	0.0026	0.0027	0.0027
1hr - Maximum	0.0032	0.0028	0.0028	0.0027	0.0027	0.0028	0.0028
Standard 1hr - Average	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Standard 24 hrs - Average	0.12	0.12	0.12	0.12	0.12	0.12	0.12

Standard : Notification of the National Environment Board No.10, 1995 (B.E.2538), No. 21, 2001 (B.E.2544) and No.24, 2004 (B.E.2547).

Reference Method : U.S. Environmental Protection Agency, EPA Method Part 53 and 58

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Life Sciences

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140

P/O : GTS4-4210500514

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595449

Date Received : Oct 29, 2025

Date Reported : Nov 04, 2025

Report Number: 3442222-1C7

Page 1 of 1

Sample Description	Air 6 uality						
Location	โรงเรียนชุมชนวัดบ้านศาลาละโวอ (GPS 4(P 0(3) 199, 1443917x						
Parameter	Sulfur Dioxide (ppm)						
Measurement Date	Oct 20, 2025 - Oct 27, 2025						
Measurement by	Anurak Tongkhajonsakda						
	2595449-1 Oct 20, 2025	2595449-2 Oct 21, 2025	2595449-3 Oct 22, 2025	2595449-4 Oct 23, 2025	2595449-5 Oct 24, 2025	2595449-6 Oct 25, 2025	2595449-7 Oct 26, 2025
Time							
10:00 AM - 11:00 AM	0.0005	0.0000	0.0007	0.0007	0.0007	0.0007	0.0007
11:00 AM - 12:00 PM	0.0012	0.0000	0.0007	0.0007	0.0007	0.0007	0.0007
12:00 PM - 01:00 PM	0.0010	0.0000	0.0007	0.0007	0.0007	0.0007	0.0007
01:00 PM - 02:00 PM	0.0010	0.0000	0.0007	0.0007	0.0007	0.0007	0.0007
02:00 PM - 03:00 PM	0.0010	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007
03:00 PM - 04:00 PM	0.0009	0.0007	0.0007	0.0000	0.0007	0.0000	0.0007
04:00 PM - 05:00 PM	0.0010	0.0007	0.0007	0.0007	0.0007	0.0007	0.0000
05:00 PM - 07:00 PM	0.0010	0.0000	0.0007	0.0007	0.0007	0.0000	0.0007
07:00 PM - 08:00 PM	0.0010	0.0000	0.0000	0.0007	0.0000	0.0007	0.0007
08:00 PM - 09:00 PM	0.0010	0.0000	0.0007	0.0000	0.0000	0.0007	0.0000
09:00 PM - 10:00 PM	0.0010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
10:00 PM - 11:00 PM	0.0009	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
11:00 PM - 12:00 AM	0.0009	0.0000	0.0000	0.0000	0.0000	0.0000	0.0007
12:00 AM - 01:00 AM	0.0009	0.0000	0.0000	0.0000	0.0000	0.0007	0.0000
01:00 AM - 02:00 AM	0.0009	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
02:00 AM - 03:00 AM	0.0009	0.0000	0.0000	0.0000	0.0007	0.0000	0.0000
03:00 AM - 04:00 AM	0.0009	0.0000	0.0000	0.0007	0.0000	0.0007	0.0000
04:00 AM - 05:00 AM	0.0009	0.0000	0.0000	0.0007	0.0007	0.0000	0.0000
05:00 AM - 07:00 AM	0.0000	0.0000	0.0000	0.0000	0.0007	0.0000	0.0000
07:00 AM - 08:00 AM	0.0000	0.0000	0.0000	0.0000	0.0007	0.0000	0.0000
08:00 AM - 09:00 AM	0.0009	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
09:00 AM - 10:00 AM	0.0000	0.0000	0.0000	0.0007	0.0000	0.0000	0.0000
10:00 AM - 11:00 AM	0.0000	0.0000	0.0000	0.0007	0.0000	0.0007	0.0000
Average	0.0009	0.0000	0.0000	0.0007	0.0007	0.0000	0.0000
1hr - Maximum	0.0012	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Standard 1hr - Average	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Standard 24 hrs - Average	0.12	0.12	0.12	0.12	0.12	0.12	0.12

Standard : Notification of the National Environment Board No.10, 1995 (B.E.2538), No. 21, 2001 (B.E.2544) and No.24, 2004 (B.E.2547).

Reference Method : U.S. Environmental Protection Agency, EPA Method Part 53 and 58

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Life Sciences

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140

P/O : GTS4-4210500514

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595449

Date Received : Oct 29, 2025

Date Reported : Nov 04, 2025

Report Number: 3442223-1C7

Page 1 of 1

Sample Description Air 6 uality
Location โรงเรียนบ้านระเวียง อําเภอรําไพพรรณี (GPS 4) P 0) 39512, 144) 941(
Parameter Sulfur Dioxide ppm(
Measurement Date Oct 20, 2025 - Oct 2), 2025
Measurement by Anurak Tongkhajonsakda

Time	2595449-15 Oct 20, 2025	2595449-17 Oct 21, 2025	2595449-1) 1 Oct 22, 2025	2595449-18 Oct 23, 2025	2595449-19 Oct 24, 2025	2595449-20 Oct 25, 2025	2595449-21 Oct 27, 2025
12:00 PM - 01:00 PM	0.0035	0.0030	0.0031	0.0030	0.0031	0.0030	0.0029
01:00 PM - 02:00 PM	0.0043	0.0030	0.0030	0.0031	0.0031	0.0030	0.0030
02:00 PM - 03:00 PM	0.0045	0.0030	0.0030	0.0030	0.0031	0.0030	0.0030
03:00 PM - 04:00 PM	0.0047	0.0030	0.0031	0.0031	0.0031	0.0030	0.0029
04:00 PM - 05:00 PM	0.004	0.0030	0.0031	0.0030	0.0031	0.0030	0.0029
05:00 PM - 07:00 PM	0.004	0.0030	0.0031	0.0031	0.0031	0.0030	0.0029
07:00 PM - 0) :00 PM	0.004	0.0030	0.0030	0.0030	0.0031	0.0030	0.0029
0) :00 PM - 08:00 PM	0.004	0.0030	0.0030	0.0030	0.0031	0.0030	0.0029
08:00 PM - 09:00 PM	0.004	0.0031	0.0030	0.0031	0.0031	0.0030	0.0029
09:00 PM - 10:00 PM	0.004	0.0030	0.0031	0.0032	0.0032	0.0030	0.0029
10:00 PM - 11:00 PM	0.004	0.0031	0.0031	0.0031	0.0032	0.0032	0.0029
11:00 PM - 12:00 AM	0.004	0.0030	0.0033	0.0031	0.0032	0.0031	0.0029
12:00 AM - 01:00 AM	0.004	0.0030	0.0034	0.0031	0.0031	0.0031	0.0030
01:00 AM - 02:00 AM	0.004	0.0031	0.0032	0.0032	0.0033	0.0030	0.0030
02:00 AM - 03:00 AM	0.004	0.0030	0.0031	0.0032	0.0035	0.0030	0.0030
03:00 AM - 04:00 AM	0.0048	0.0030	0.0031	0.0031	0.0033	0.0030	0.0030
04:00 AM - 05:00 AM	0.0048	0.0032	0.0034	0.0031	0.0033	0.0030	0.0029
05:00 AM - 07:00 AM	0.0048	0.0032	0.0032	0.0031	0.0032	0.0030	0.0029
07:00 AM - 0) :00 AM	0.0048	0.0032	0.0032	0.0031	0.0031	0.0030	0.0030
0) :00 AM - 08:00 AM	0.0051	0.0032	0.0032	0.0032	0.0031	0.0030	0.0031
08:00 AM - 09:00 AM	0.0049	0.0031	0.0031	0.0032	0.0031	0.0030	0.0030
09:00 AM - 10:00 AM	0.0042	0.0030	0.0031	0.0032	0.0031	0.0030	0.0031
10:00 AM - 11:00 AM	0.0031	0.0031	0.0031	0.0032	0.0031	0.0030	0.0032
11:00 AM - 12:00 PM	0.0030	0.0030	0.0031	0.0032	0.0030	0.0029	0.0030
Average	0.0045	0.0031	0.0031	0.0031	0.0032	0.0030	0.0030
1hr - Maximum	0.0051	0.0032	0.0034	0.0032	0.0035	0.0032	0.0032
Standard 1hr - Average	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Standard 24 hrs - Average	0.12	0.12	0.12	0.12	0.12	0.12	0.12

Standard : Notification of the National Environment Board No.10, 1995 B.E.2538(, No. 21, 2001 B.E.2544(and No.24, 2004 B.E.254) (.
Reference Method : U.S. Environmental Protection Agency, EPA Method Part 53 and 58

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140

P/O : GTS4-4210500514

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595449

Date Received : Oct 29, 2025

Date Reported : Nov 04, 2025

Report Number: 3442224-1C7

Page 1 of 1

Sample Description Air 6 uality
Location รัดจอมพลเจ้าพระยา GPS 4(P 0(3)1(0, 144293(x
Parameter Sulfur Dioxide ppmx
Measurement Date Oct 20, 2025 - Oct 2(, 2025
Measurement by Anurak Tongkhajonsakda

Time	2595449-22 Oct 20, 2025	2595449-23 Oct 21, 2025	2595449-24 Oct 22, 2025	2595449-25 Oct 23, 2025	2595449-27 Oct 24, 2025	2595449-2(1 Oct 25, 2025	2595449-2) 2 Oct 27, 2025
09:00 AM - 10:00 AM	0.0041	0.0037	0.003(	0.0037	0.003(	0.0037	0.0035
10:00 AM - 11:00 AM	0.0049	0.0037	0.0037	0.003(	0.003(	0.0037	0.0037
11:00 AM - 12:00 PM	0.0051	0.0037	0.0037	0.0037	0.003(	0.0037	0.0037
12:00 PM - 01:00 PM	0.0052	0.0037	0.003(	0.003(	0.003(	0.0037	0.0035
01:00 PM - 02:00 PM	0.0053	0.0037	0.003(	0.0037	0.003(	0.0037	0.0035
02:00 PM - 03:00 PM	0.0053	0.0037	0.003(	0.003(	0.003(	0.0037	0.0035
03:00 PM - 04:00 PM	0.0053	0.0037	0.0037	0.0037	0.003(	0.0037	0.0035
04:00 PM - 05:00 PM	0.0053	0.0037	0.0037	0.0037	0.003(	0.0037	0.0035
05:00 PM - 07:00 PM	0.0053	0.003(	0.0037	0.003(	0.003(	0.0037	0.0035
07:00 PM - 0(:00 PM	0.0053	0.0037	0.003(	0.003(	0.003(	0.0037	0.0035
0(:00 PM - 0) :00 PM	0.0053	0.003(	0.003(	0.003(	0.003(	0.003(	0.0035
0) :00 PM - 09:00 PM	0.0053	0.0037	0.0039	0.003(	0.003(	0.003(	0.0035
09:00 PM - 10:00 PM	0.0053	0.0037	0.0040	0.003(	0.003(	0.003(	0.0037
10:00 PM - 11:00 PM	0.0053	0.003(	0.003(	0.003(	0.0039	0.0037	0.0037
11:00 PM - 12:00 AM	0.0053	0.0037	0.003(	0.003(	0.0041	0.0037	0.0037
12:00 AM - 01:00 AM	0.0054	0.0037	0.003(	0.0039	0.0039	0.0037	0.0037
01:00 AM - 02:00 AM	0.0054	0.003(	0.0040	0.003(	0.0039	0.0037	0.0035
02:00 AM - 03:00 AM	0.0054	0.003(	0.003(	0.003(	0.003(	0.0037	0.0035
03:00 AM - 04:00 AM	0.0054	0.003(	0.003(	0.003(	0.003(	0.0037	0.0037
04:00 AM - 05:00 AM	0.005(	0.003(	0.003(	0.003(	0.003(	0.0037	0.003(
05:00 AM - 07:00 AM	0.0055	0.003(	0.003(	0.003(	0.003(	0.0037	0.0037
07:00 AM - 0(:00 AM	0.004	0.0037	0.003(	0.003(	0.003(	0.0037	0.003(
0(:00 AM - 0) :00 AM	0.003(	0.003(	0.003(	0.003(	0.003(	0.0037	0.003(
0) :00 AM - 09:00 AM	0.0037	0.0037	0.003(	0.003(	0.0037	0.0035	0.0037
Average	0.0051	0.003(	0.003(	0.003(	0.003(	0.0037	0.0037
1hr - Maximum	0.005(	0.003(	0.0040	0.003(	0.0041	0.003(	0.003(
Standard 1hr - Average	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Standard 24 hrs - Average	0.12	0.12	0.12	0.12	0.12	0.12	0.12

Standard : Notification of the National Environment Board No.10, 1995 B.E.253) x, No. 21, 2001 B.E.2544x and No.24, 2004 B.E.254(x.
Reference Method : U.S. Environmental Protection Agency, EPA Method Part 53 and 5))

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Life Sciences

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595450

Date Received : Oct 29, 2025

Date Reported : Nov 04, 2025

Report Number : 3427215-1 C6

Page 1 of 2

Sample Number : 2595450-1 to 7
Parameter : Wind Speed / Wind Direction
Location : โรงเรียนบ้านสุรศักดิ์ (GPS 47P 0735497, 1445317)
Sampling Date : Oct 20 - Oct 27, 2025
Sampling by : Anurak Tongkhajonsakda

Time	Oct 20 - Oct 21, 2025			Oct 21 - Oct 22, 2025			Oct 22 - Oct 23, 2025			Oct 23 - Oct 24, 2025			Oct 24 - Oct 25, 2025			Oct 25 - Oct 26, 2025			Oct 26 - Oct 27, 2025		
	WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)	
11:00 AM - 12:00 PM	0.8	249.0	WSW	1.8	262.0	W	1.4	356.0	N	0.6	245.0	WSW	1.1	144.0	SE	0.7	225.0	SW	1.0	172.0	S
12:00 PM - 01:00 PM	0.4	256.0	WSW	0.9	144.0	SE	0.7	166.0	SSE	2.7	203.0	SSW	1.0	132.0	SE	1.0	170.0	S	1.6	309.0	NW
01:00 PM - 02:00 PM	0.9	128.0	SE	0.4	164.0	SSE	2.1	100.0	E	1.2	7.0	N	0.5	145.0	SE	0.8	217.0	SW	0.5	153.0	SSE
02:00 PM - 03:00 PM	0.0	-	-	0.0	-	-	1.5	264.0	W	0.9	83.0	E	0.3	126.0	SE	1.6	35.0	NE	0.9	188.0	S
03:00 PM - 04:00 PM	0.5	106.0	ESE	0.8	70.0	ENE	0.9	116.0	ESE	0.0	-	-	0.6	197.0	SSW	0.6	71.0	ENE	0.5	267.0	W
04:00 PM - 05:00 PM	0.2	-	-	0.4	247.0	WSW	0.1	-	-	0.8	359.0	N	0.8	146.0	SE	0.2	-	-	0.7	96.0	E
05:00 PM - 06:00 PM	0.0	-	-	0.0	-	-	0.6	68.0	ENE	0.0	-	-	0.7	242.0	WSW	1.5	29.0	NNE	0.6	103.0	ESE
06:00 PM - 07:00 PM	0.0	-	-	0.0	-	-	0.0	-	-	0.0	-	-	0.5	158.0	SSE	0.0	-	-	0.6	161.0	SSE
07:00 PM - 08:00 PM	0.0	-	-	0.0	-	-	0.1	-	-	0.0	-	-	0.0	-	-	0.0	-	-	0.1	-	-
08:00 PM - 09:00 PM	1.6	31.0	NNE	0.0	-	-	1.0	59.0	ENE	0.0	-	-	0.3	243.0	WSW	0.0	-	-	0.5	71.0	ENE
09:00 PM - 10:00 PM	0.7	359.0	N	0.2	-	-	0.1	-	-	0.8	230.0	SW	0.5	263.0	W	0.0	-	-	0.0	-	-
10:00 PM - 11:00 PM	0.0	-	-	0.0	-	-	0.3	83.0	E	0.4	104.0	ESE	0.0	-	-	0.0	-	-	0.1	-	-
11:00 PM - 12:00 AM	0.0	-	-	0.0	-	-	0.3	88.0	E	0.5	169.0	S	0.3	100.0	E	0.0	-	-	0.4	87.0	E
12:00 AM - 01:00 AM	0.0	-	-	0.9	90.0	E	0.4	171.0	S	0.4	154.0	SSE	0.2	-	-	0.0	-	-	0.1	-	-
01:00 AM - 02:00 AM	0.0	-	-	0.0	-	-	0.0	-	-	1.0	174.0	S	0.3	237.0	WSW	0.0	-	-	0.0	-	-
02:00 AM - 03:00 AM	0.0	-	-	0.0	-	-	0.7	92.0	E	0.5	127.0	SE	0.2	-	-	0.3	75.0	ENE	0.4	101.0	E
03:00 AM - 04:00 AM	0.0	-	-	0.0	-	-	1.1	222.0	SW	0.6	175.0	S	0.7	162.0	SSE	0.0	-	-	0.0	-	-
04:00 AM - 05:00 AM	0.0	-	-	0.3	213.0	SSW	0.6	96.0	E	0.7	137.0	SE	1.3	148.0	SSE	0.3	225.0	SW	0.2	-	-
05:00 AM - 06:00 AM	0.0	-	-	0.0	-	-	0.5	214.0	SW	0.7	107.0	ESE	0.6	228.0	SW	0.5	50.0	NE	0.0	-	-
06:00 AM - 07:00 AM	0.0	-	-	0.6	72.0	ENE	1.1	191.0	S	0.8	125.0	SE	0.9	104.0	ESE	0.2	-	-	0.0	-	-
07:00 AM - 08:00 AM	0.0	-	-	0.7	335.0	NNW	1.8	270.0	W	0.7	205.0	SSW	0.2	-	-	0.3	94.0	E	0.4	117.0	ESE
08:00 AM - 09:00 AM	0.6	9.0	N	1.6	102.0	ESE	0.3	230.0	SW	1.0	330.0	NNW	1.2	78.0	ENE	0.1	-	-	0.6	124.0	SE
09:00 AM - 10:00 AM	1.7	203.0	SSW	1.6	145.0	SE	3.2	86.0	E	2.9	240.0	WSW	1.3	230.0	SW	0.6	228.0	SW	1.7	161.0	SSE
10:00 AM - 11:00 AM	1.2	39.0	NE	2.0	98.0	E	1.7	309.0	NW	0.5	132.0	SE	0.9	117.0	ESE	2.0	87.0	E	0.5	137.0	S

Reference Method : Cup Anemometer & Anodized Aluminium Vane Method

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Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location : GTS4

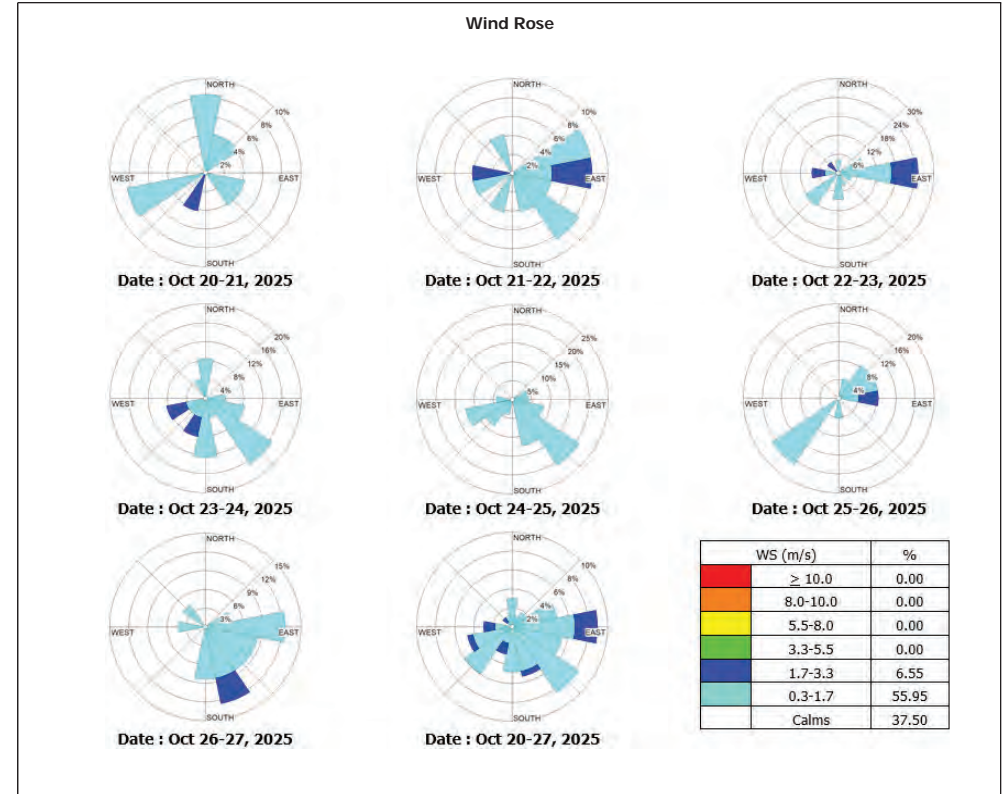
Lot ID: 2595450

Date Received : Oct 29, 2025

Date Reported : Nov 04, 2025

Report Number : 3427215-1 C6

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Location : โรงเรียนบ้านสุรศักดิ์ (GPS 47P 0735497, 1445317)

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Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595450

Date Received : Oct 29, 2025

Date Reported : Nov 04, 2025

Report Number : 3427215-1 C6

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Sample Number : 2595450-8 to 14
Parameter : Wind Speed / Wind Direction
Location : โรงเรียนชุมชนบริษัทยาตลาดตะวันออก (GPS 47P 0738199, 1443916)
Sampling Date : Oct 20 - Oct 27, 2025
Sampling by : Anurak Tongkhajonsakda

Time	Oct 20 - Oct 21, 2025			Oct 21 - Oct 22, 2025			Oct 22 - Oct 23, 2025			Oct 23 - Oct 24, 2025			Oct 24 - Oct 25, 2025			Oct 25 - Oct 26, 2025			Oct 26 - Oct 27, 2025		
	WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)	
10:00 AM - 11:00 AM	0.0	-	-	3.0	7.0	N	1.8	339.0	NNW	2.1	26.0	NNE	0.7	26.0	NNE	1.6	59.0	ENE	0.7	304.0	NW
11:00 AM - 12:00 PM	0.2	-	-	1.3	20.0	NNE	5.6	15.0	NNE	4.0	21.0	NNE	4.1	72.0	ENE	1.4	20.0	NNE	1.3	20.0	NNE
12:00 PM - 01:00 PM	0.3	17.0	NNE	3.8	31.0	NNE	2.5	54.0	NE	4.8	25.0	NNE	3.3	30.0	NNE	2.2	27.0	NNE	2.3	29.0	NNE
01:00 PM - 02:00 PM	0.5	7.0	N	3.4	23.0	NNE	1.5	5.0	N	1.8	33.0	NNE	1.6	69.0	ENE	3.0	53.0	NE	1.7	62.0	ENE
02:00 PM - 03:00 PM	0.0	-	-	1.9	7.0	N	1.6	58.0	ENE	0.6	5.0	N	0.0	-	-	0.6	19.0	NNE	3.5	58.0	ENE
03:00 PM - 04:00 PM	0.7	107.0	ESE	2.0	73.0	ENE	3.0	72.0	ENE	3.2	10.0	N	0.0	-	-	0.4	29.0	NNE	1.9	37.0	NE
04:00 PM - 05:00 PM	0.0	-	-	0.3	27.0	NNE	1.5	86.0	E	1.9	49.0	NE	2.8	24.0	NNE	0.6	19.0	NNE	1.5	22.0	NNE
05:00 PM - 06:00 PM	0.0	-	-	2.4	13.0	NNE	1.6	46.0	NE	0.3	19.0	NNE	0.0	-	-	1.3	78.0	ENE	0.0	-	-
06:00 PM - 07:00 PM	0.0	-	-	0.0	-	-	2.5	46.0	NE	1.1	5.0	N	0.0	-	-	0.0	-	-	0.4	0.0	N
07:00 PM - 08:00 PM	1.2	35.0	NE	0.0	-	-	1.8	16.0	NNE	0.0	-	-	0.8	10.0	N	0.0	-	-	0.7	10.0	N
08:00 PM - 09:00 PM	2.3	63.0	ENE	0.0	-	-	0.6	39.0	NE	0.0	-	-	0.9	28.0	NNE	0.0	-	-	0.2	-	-
09:00 PM - 10:00 PM	1.0	226.0	SW	0.0	-	-	1.8	72.0	ENE	1.0	20.0	NNE	1.3	0.0	N	0.0	-	-	1.5	82.0	E
10:00 PM - 11:00 PM	0.5	182.0	S	0.0	-	-	1.2	10.0	N	0.8	2.0	N	2.7	359.0	N	0.0	-	-	0.2	-	-
11:00 PM - 12:00 AM	0.6	283.0	WNW	1.0	30.0	NNE	3.2	359.0	N	0.0	-	-	0.4	11.0	N	0.0	-	-	0.7	0.0	N
12:00 AM - 01:00 AM	0.0	-	-	0.0	-	-	0.4	359.0	N	0.0	-	-	0.3	358.0	N	0.0	-	-	0.8	6.0	N
01:00 AM - 02:00 AM	0.0	-	-	0.5	358.0	N	1.1	36.0	NE	1.0	359.0	N	2.3	20.0	NNE	0.4	44.0	NE	0.6	347.0	NNW
02:00 AM - 03:00 AM	0.0	-	-	0.0	-	-	0.0	-	-	0.0	-	-	0.4	2.0	N	1.2	18.0	NNE	0.3	0.0	N
03:00 AM - 04:00 AM	0.0	-	-	1.0	20.0	NNE	2.0	93.0	E	2.1	342.0	NNW	3.9	20.0	NNE	0.0	-	-	0.0	-	-
04:00 AM - 05:00 AM	0.0	-	-	0.3	0.0	N	3.2	24.0	NNE	0.0	-	-	1.9	30.0	NNE	0.0	-	-	0.0	-	-
05:00 AM - 06:00 AM	1.4	11.0	N	0.0	-	-	1.5	14.0	NNE	0.0	-	-	2.6	36.0	NE	1.2	356.0	N	0.8	17.0	NNE
06:00 AM - 07:00 AM	0.0	-	-	1.6	30.0	NNE	0.1	-	-	1.8	8.0	N	1.5	22.0	NNE	1.9	30.0	NNE	1.7	304.0	NW
07:00 AM - 08:00 AM	0.5	5.0	N	1.7	36.0	NE	0.6	14.0	NNE	1.3	18.0	NNE	0.0	-	-	1.6	29.0	NNE	0.6	19.0	NNE
08:00 AM - 09:00 AM	1.0	25.0	NNE	0.8	20.0	NNE	2.0	15.0	NNE	2.1	323.0	NW	1.9	162.0	SSE	1.9	64.0	ENE	0.4	34.0	NE
09:00 AM - 10:00 AM	1.2	35.0	NE	0.7	0.0	N	2.5	67.0	ENE	2.2	357.0	N	2.6	23.0	NNE	1.5	0.0	N	0.0	-	-

Reference Method : Cup Anemometer & Anodized Aluminium Vane Method

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Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location : GTS4

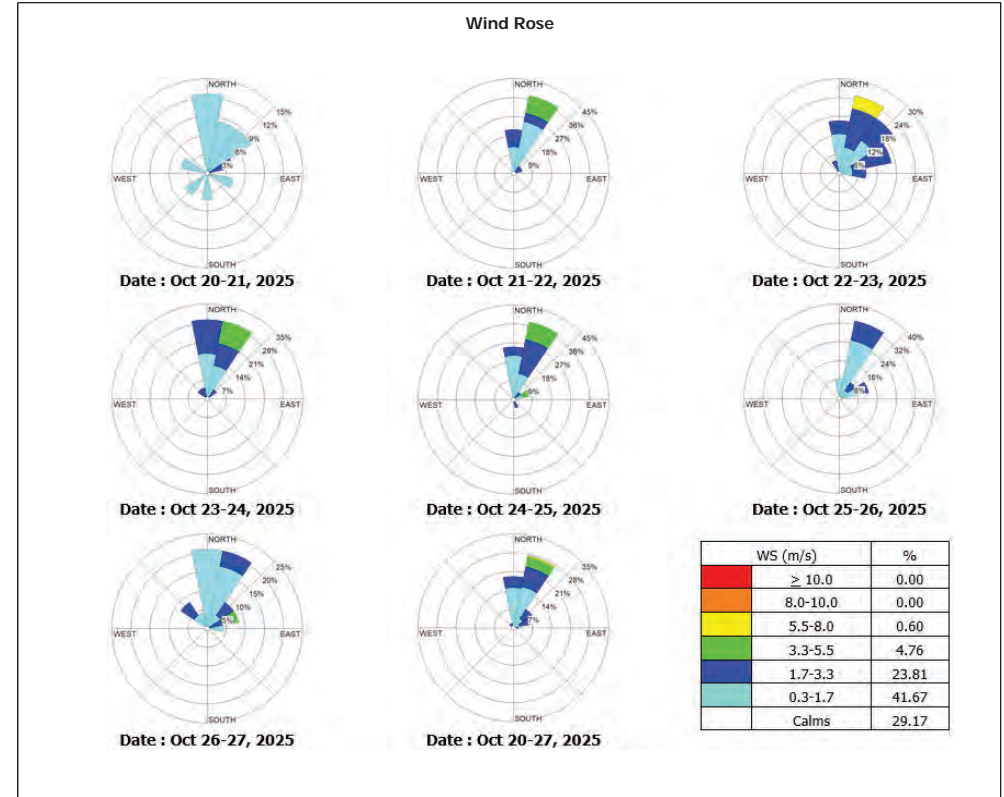
Lot ID: 2595450

Date Received : Oct 29, 2025

Date Reported : Nov 04, 2025

Report Number : 3427215-1 C6

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Location : โรงเรียนชุมชนบริษัทยาตลาดตะวันออก (GPS 47P 0738199, 1443916)

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Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595450

Date Received : Oct 29, 2025

Date Reported : Nov 04, 2025

Report Number : 3427215-1 C6

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Sample Number : 2595450-15 to 21
Parameter : Wind Speed / Wind Direction
Location : โรงเรียนบ้านระเริง (ราษฎร์อุปถัมภ์) (GPS 47P 0739512, 1447941)
Sampling Date : Oct 20 - Oct 27, 2025
Sampling by : Anurak Tongkhajonsakda

Time	Oct 20 - Oct 21, 2025			Oct 21 - Oct 22, 2025			Oct 22 - Oct 23, 2025			Oct 23 - Oct 24, 2025			Oct 24 - Oct 25, 2025			Oct 25 - Oct 26, 2025			Oct 26 - Oct 27, 2025		
	WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)	
12:00 PM - 01:00 PM	0.7	42.0	NE	3.2	43.0	NE	2.3	55.0	NE	3.5	29.0	NNE	1.6	319.0	NW	1.4	4.0	N	0.0	-	-
01:00 PM - 02:00 PM	2.8	12.0	NNE	1.0	16.0	NNE	0.7	66.0	ENE	3.4	26.0	NNE	0.9	29.0	NNE	2.8	34.0	NE	3.5	39.0	NE
02:00 PM - 03:00 PM	0.4	37.0	NE	0.9	308.0	NW	4.0	38.0	NE	2.3	62.0	ENE	1.8	200.0	SSW	3.1	8.0	N	2.8	240.0	WSW
03:00 PM - 04:00 PM	0.7	248.0	WSW	2.6	35.0	NE	1.2	351.0	N	1.5	34.0	NE	1.6	45.0	NE	0.4	111.0	ESE	1.4	11.0	N
04:00 PM - 05:00 PM	1.8	28.0	NNE	0.5	16.0	NNE	2.6	133.0	SE	0.4	50.0	NE	0.0	-	-	1.3	16.0	NNE	1.6	27.0	NNE
05:00 PM - 06:00 PM	0.6	42.0	NE	0.3	28.0	NNE	0.8	231.0	SW	1.7	340.0	NNW	0.9	70.0	ENE	2.2	346.0	NNW	0.0	-	-
06:00 PM - 07:00 PM	0.0	-	-	0.0	-	-	0.3	206.0	SSW	0.8	5.0	N	0.0	-	-	1.7	19.0	NNE	0.4	88.0	E
07:00 PM - 08:00 PM	0.0	-	-	0.5	18.0	NNE	1.7	206.0	SSW	0.0	-	-	0.0	-	-	0.4	53.0	NE	0.0	-	-
08:00 PM - 09:00 PM	0.0	-	-	0.0	-	-	1.5	106.0	ESE	0.0	-	-	0.8	34.0	NE	0.6	21.0	NNE	0.0	-	-
09:00 PM - 10:00 PM	0.5	21.0	NNE	0.0	-	-	4.8	14.0	NNE	0.9	127.0	SE	0.5	56.0	NE	0.0	-	-	0.0	-	-
10:00 PM - 11:00 PM	0.3	28.0	NNE	0.5	49.0	NE	3.6	184.0	S	0.5	69.0	ENE	0.6	31.0	NNE	0.8	332.0	NNW	0.5	18.0	NNE
11:00 PM - 12:00 AM	0.0	-	-	0.0	-	-	0.7	257.0	WSW	1.0	54.0	NE	0.0	-	-	0.0	-	-	0.0	-	-
12:00 AM - 01:00 AM	0.0	-	-	0.8	319.0	NW	0.9	125.0	SE	1.0	63.0	ENE	0.0	-	-	0.3	44.0	NE	0.7	355.0	N
01:00 AM - 02:00 AM	0.0	-	-	0.0	-	-	0.0	-	-	0.0	-	-	0.0	-	-	0.6	352.0	N	0.7	25.0	NNE
02:00 AM - 03:00 AM	0.4	15.0	NNE	0.0	-	-	2.4	125.0	SE	0.3	63.0	ENE	0.4	61.0	ENE	0.0	-	-	0.5	308.0	NW
03:00 AM - 04:00 AM	0.6	32.0	NNE	0.0	-	-	3.6	125.0	SE	1.1	40.0	NE	0.5	44.0	NE	0.0	-	-	0.0	-	-
04:00 AM - 05:00 AM	1.1	7.0	N	0.5	359.0	N	4.0	125.0	SE	1.5	3.0	N	2.0	34.0	NE	0.0	-	-	0.0	-	-
05:00 AM - 06:00 AM	0.8	22.0	NNE	2.6	335.0	NNW	3.1	125.0	SE	0.0	-	-	0.6	38.0	NE	1.8	313.0	NW	2.0	10.0	N
06:00 AM - 07:00 AM	0.0	-	-	1.0	6.0	N	1.8	125.0	SE	2.6	32.0	NNE	0.0	-	-	1.1	340.0	NNW	1.1	334.0	NNW
07:00 AM - 08:00 AM	0.0	-	-	2.4	25.0	NNE	1.5	334.0	NNW	2.1	12.0	NNE	0.0	-	-	1.1	25.0	NNE	1.2	355.0	N
08:00 AM - 09:00 AM	0.8	50.0	NE	3.7	4.0	N	0.0	-	-	1.5	27.0	NNE	2.8	59.0	ENE	0.4	27.0	NNE	1.4	60.0	ENE
09:00 AM - 10:00 AM	1.6	69.0	ENE	1.6	41.0	NE	3.2	64.0	ENE	2.3	35.0	NE	0.0	-	-	2.0	49.0	NE	0.2	-	-
10:00 AM - 11:00 AM	4.1	80.0	E	0.6	45.0	NE	3.3	39.0	NE	2.7	41.0	NE	0.4	327.0	NNW	3.8	351.0	N	0.8	5.0	N
11:00 AM - 12:00 PM	1.0	60.0	ENE	1.7	16.0	NNE	1.4	42.0	NE	2.9	59.0	ENE	1.7	38.0	NE	2.0	67.0	ENE	0.5	11.0	N

Reference Method : Cup Anemometer & Anodized Aluminium Vane Method

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Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location : GTS4

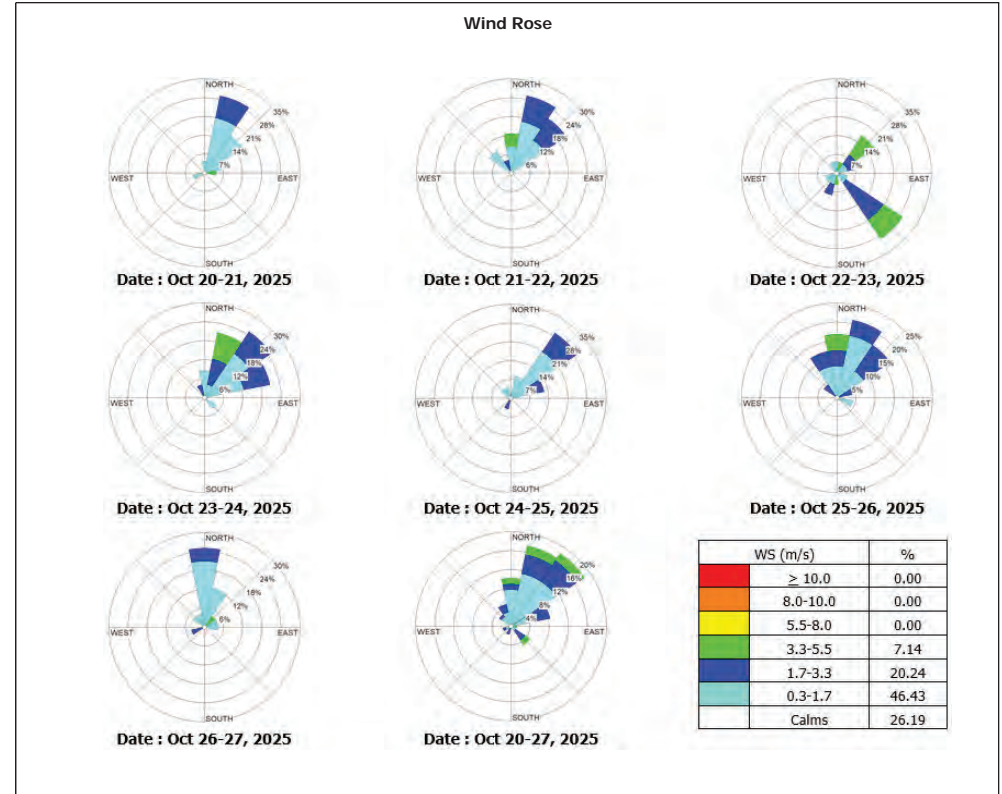
Lot ID: 2595450

Date Received : Oct 29, 2025

Date Reported : Nov 04, 2025

Report Number : 3427215-1 C6

Page 2 of 2



Location : โรงเรียนบ้านระเริง (ราษฎร์อุปถัมภ์) (GPS 47P 0739512, 1447941)

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Approved by

Sarayuht Jittranoit
Assistant General Manager

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595450

Date Received : Oct 29, 2025

Date Reported : Nov 04, 2025

Report Number : 3427215-1 C6

Page 1 of 2

Sample Number : 2595450-22 to 28
Parameter : Wind Speed / Wind Direction
Location : วัดจอมพลเจ้าพระยา (GPS 47P 0738170, 1442937)
Sampling Date : Oct 20 - Oct 27, 2025
Sampling by : Anurak Tongkhajonsakda

Time	Oct 20 - Oct 21, 2025			Oct 21 - Oct 22, 2025			Oct 22 - Oct 23, 2025			Oct 23 - Oct 24, 2025			Oct 24 - Oct 25, 2025			Oct 25 - Oct 26, 2025			Oct 26 - Oct 27, 2025		
	WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)		WS (m/s)	WD (deg)	
09:00 AM - 10:00 AM	1.6	77.0	ENE	0.8	105.0	ESE	1.1	352.0	N	0.9	38.0	NE	1.2	86.0	E	3.7	23.0	NNE	0.8	52.0	NE
10:00 AM - 11:00 AM	1.2	90.0	E	0.0	-	-	0.6	116.0	ESE	1.3	62.0	ENE	2.6	34.0	NE	1.6	130.0	SE	1.4	57.0	ENE
11:00 AM - 12:00 PM	1.1	63.0	ENE	1.1	178.0	S	1.3	73.0	ENE	1.2	49.0	NE	3.2	355.0	N	2.4	95.0	E	1.0	73.0	ENE
12:00 PM - 01:00 PM	1.8	321.0	NW	0.6	147.0	SSE	1.6	73.0	ENE	0.3	85.0	E	1.2	6.0	N	0.4	70.0	ENE	0.6	60.0	ENE
01:00 PM - 02:00 PM	1.0	88.0	E	1.7	240.0	WSW	0.9	91.0	E	1.7	101.0	E	0.0	-	-	1.8	89.0	E	0.5	69.0	ENE
02:00 PM - 03:00 PM	1.8	2.0	N	0.4	285.0	WNW	5.0	71.0	ENE	1.3	124.0	SE	1.3	196.0	SSW	2.1	74.0	ENE	0.9	11.0	N
03:00 PM - 04:00 PM	0.4	60.0	ENE	0.2	-	-	2.1	48.0	NE	4.7	134.0	SE	1.3	166.0	SSE	1.3	171.0	S	0.0	-	-
04:00 PM - 05:00 PM	0.0	-	-	0.0	-	-	2.5	92.0	E	0.8	147.0	SSE	0.0	-	-	1.3	132.0	SE	1.4	359.0	N
05:00 PM - 06:00 PM	0.4	36.0	NE	0.0	-	-	1.8	124.0	SE	0.8	119.0	ESE	0.4	183.0	S	0.8	61.0	ENE	1.2	59.0	ENE
06:00 PM - 07:00 PM	0.7	330.0	NNW	0.0	-	-	1.0	24.0	NNE	0.0	-	-	0.0	-	-	1.0	69.0	ENE	0.0	-	-
07:00 PM - 08:00 PM	0.0	-	-	0.0	-	-	2.9	29.0	NNE	1.5	91.0	E	1.3	242.0	WSW	0.0	-	-	0.0	-	-
08:00 PM - 09:00 PM	0.6	45.0	NE	0.0	-	-	2.1	52.0	NE	0.7	193.0	SSW	0.7	186.0	S	0.0	-	-	0.0	-	-
09:00 PM - 10:00 PM	0.4	68.0	ENE	0.3	344.0	NNW	0.0	-	-	0.0	-	-	0.5	215.0	SW	0.0	-	-	0.0	-	-
10:00 PM - 11:00 PM	0.6	113.0	ESE	0.6	353.0	N	0.0	-	-	0.0	-	-	0.0	-	-	0.0	-	-	0.3	43.0	NE
11:00 PM - 12:00 AM	1.4	84.0	E	0.0	-	-	0.0	-	-	0.0	-	-	0.0	-	-	0.3	61.0	ENE	0.5	333.0	NNW
12:00 AM - 01:00 AM	1.0	17.0	NNE	0.0	-	-	0.8	345.0	NNW	0.5	98.0	E	0.0	-	-	0.6	61.0	ENE	0.7	344.0	NNW
01:00 AM - 02:00 AM	0.1	-	-	0.0	-	-	1.3	94.0	E	0.0	-	-	0.0	-	-	0.0	-	-	0.0	-	-
02:00 AM - 03:00 AM	0.1	-	-	0.0	-	-	0.4	60.0	ENE	0.2	-	-	0.7	359.0	N	1.1	71.0	ENE	0.0	-	-
03:00 AM - 04:00 AM	0.3	87.0	E	0.0	-	-	1.0	33.0	NNE	0.3	141.0	SE	0.4	348.0	NNW	0.4	72.0	ENE	0.6	73.0	ENE
04:00 AM - 05:00 AM	0.7	43.0	NE	0.5	18.0	NNE	0.7	76.0	ENE	0.5	115.0	ESE	0.0	-	-	1.3	133.0	SE	0.0	-	-
05:00 AM - 06:00 AM	1.0	37.0	NE	1.3	18.0	NNE	1.1	80.0	E	1.2	158.0	SSE	1.9	30.0	NNE	2.0	147.0	SSE	0.7	61.0	ENE
06:00 AM - 07:00 AM	0.9	74.0	ENE	4.0	92.0	E	1.2	64.0	ENE	0.6	193.0	SSW	2.7	347.0	NNW	1.6	132.0	SE	1.3	100.0	E
07:00 AM - 08:00 AM	0.7	60.0	ENE	0.8	52.0	NE	1.3	66.0	ENE	1.1	144.0	SE	0.1	-	-	0.0	-	-	0.8	153.0	SSE
08:00 AM - 09:00 AM	1.0	65.0	ENE	1.4	57.0	ENE	2.4	70.0	ENE	0.7	95.0	E	3.4	30.0	NNE	0.0	-	-	0.4	102.0	ESE

Reference Method : Cup Anemometer & Anodized Aluminium Vane Method

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Approved by

Sarayuth Jitranont
Assistant General Manager

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location : GTS4

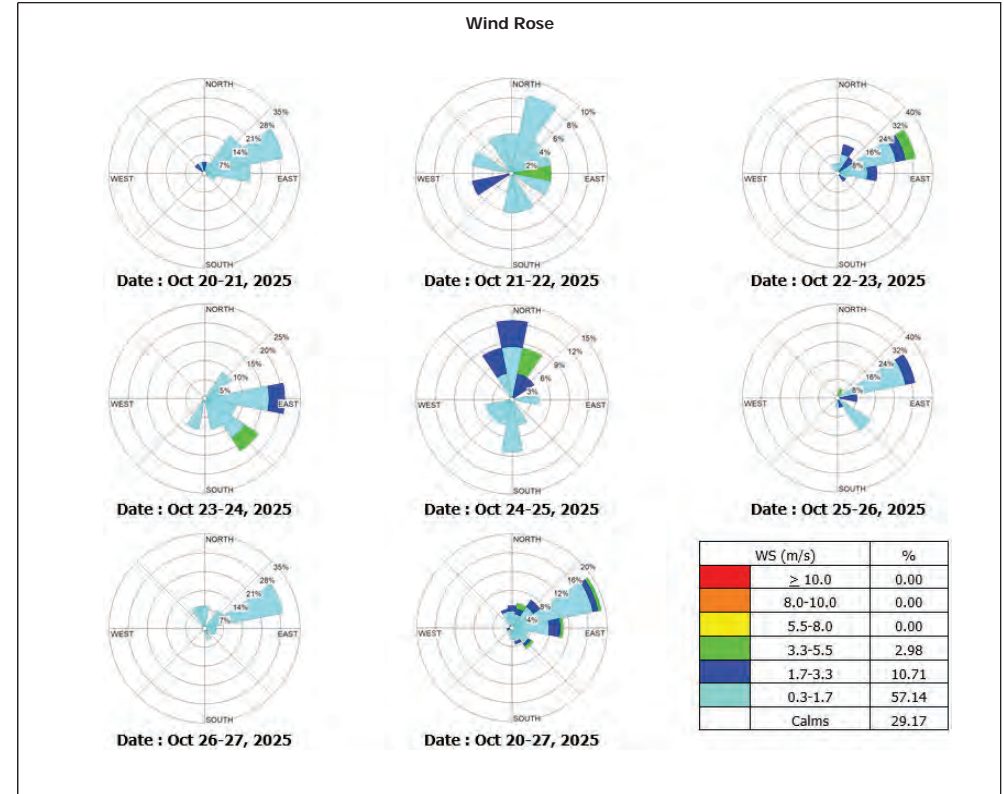
Lot ID: 2595450

Date Received : Oct 29, 2025

Date Reported : Nov 04, 2025

Report Number : 3427215-1 C6

Page 2 of 2



Location : วัดจอมพลเจ้าพระยา (GPS 47P 0738170, 1442937)

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Assistant General Manager

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ภาคผนวก ค-2

คุณภาพอากาศจากปล่องระบายอากาศ



Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140
P/O : 4210502708
Project Name : Monitoring EIA
Project Location : GTS4

Lot ID: 2595459
Date Received :Oct 21, 2025
Date Reported :Oct 30, 2025
Report Number :3427262-1

Page 1 of 1

Sample Number	2595459-1							
Sample Description	Emission from Stationary Source							
Location	แปลง HRSG 11 (GPS 47P 0737118, 1445371)							
Sampled Date	Oct 21, 2025							
Stack Description								
Ambient Temperature	31.2	°C	Diameter	3.00	m	Oxygen	14.34	%
Ambient Pressure	749	mmHg	Shape	Circle		Carbon dioxide	3.71	%
Type of Process	Combustion		Stack Temperature	109	°C	Gas Velocity	15.82	m/s
Type of Fuel	Natural Gas		Moisture	8.59	%	Flow Rate	282658	Nm3/hr

Run No.	Sampling Time	Oxygen (%)	Carbon Dioxide (%)	Oxides of Nitrogen (ppm)		Sulfur Dioxide (ppm)	
				at Actual O ₂	at 7% O ₂	at Actual O ₂	at 7% O ₂
1	11:30 AM - 11:50 AM	14.37	3.70	17.64	37.56	0.37	0.79
2	11:51 AM - 12:11 PM	14.39	3.68	18.04	38.50	0.34	0.72
3	12:12 PM - 12:32 PM	14.27	3.74	17.29	36.23	0.32	0.67
Average (ppm)		14.34	3.71	17.66	37.43	0.34	0.72
Guideline ^{1/} (ppm)				-	60	-	6
Guideline ^{2/} (ppm)				-	120	-	20
Result (mg/Nm ³)				33.22	70.43	0.89	1.90
Emission Rate at Actual O ₂ (g/s)				2.6080		0.0702	
Guideline ^{1/} (g/s)				7.4		1.0	
Method				US EPA Method 7E		US EPA Method 6C	

Sampled By : Saksit Phaisanphisut

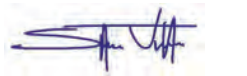
Guideline : ^{1/}Environmental Impact Assessment Report of Gulf TS4 Co., Ltd.

^{2/}Notification of the Ministry of Natural Resources and Environment, 2023 (B.E. 2566) on Emission Standard from Power Plants.

Technical Management


Wichan Choonharat
Manager
ทะเบียนเลขที่ ว-204-ค-0006

Approved by


Sarayuth Jittranont
Assistant General Manager
ทะเบียนเลขที่ ว-204-ค-0003

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140
P/O : 4210502708
Project Name : Monitoring EIA
Project Location : GTS4

Lot ID: 2595459
Date Received :Oct 21, 2025
Date Reported :Oct 30, 2025
Report Number :3427262-1

Page 1 of 1

Sample Number	2595459-1							
Sample Description	Emission from Stationary Source							
Location	แปลง HRSG 11 (GPS 47P 0737118, 1445371)							
Sampled Date	Oct 21, 2025							
Stack Description								
Ambient Temperature	31.2	°C	Diameter	3.00	m	Oxygen	14.34	%
Ambient Pressure	749	mmHg	Shape	Circle		Carbon dioxide	3.71	%
Type of Process	Combustion		Stack Temperature	109	°C	Gas Velocity	15.82	m/s
Type of Fuel	Natural Gas		Moisture	8.59	%	Flow Rate	282658	Nm3/hr

Run No.	Sampling Time	Oxygen (%)	Carbon Dioxide (%)	Carbon Monoxide (ppm)	
				at Actual O ₂	At 7% O ₂
1	11:30 AM - 11:50 AM	14.37	3.70	3.37	7.18
2	11:51 AM - 12:11 PM	14.39	3.68	3.27	6.97
3	12:12 PM - 12:32 PM	14.27	3.74	3.07	6.43
Average (ppm)		14.34	3.71	3.23	6.86
Guideline (ppm)				-	690
Result (mg/Nm ³)				3.70	7.86
Emission Rate at Actual O ₂ (g/s)				0.2908	
Method				US EPA Method 10	

Sampled By : Saksit Phaisanphisut

Guideline : Notification of the Ministry of Industry 2006 (B.E. 2549) Published in the Royal Government Gazette, Vol.123 Special Part 125 D, dated December 4, 2006 (B.E. 2549)

Technical Management


Wichan Choonharat
Manager
ทะเบียนเลขที่ ว-204-ค-0006

Approved by


Sarayuth Jittranont
Assistant General Manager
ทะเบียนเลขที่ ว-204-ค-0003

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Analysis / Test Report



Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O : 4210502708

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595461

Date Received : Oct 22, 2025

Date Reported : Oct 30, 2025

Report Number: 3427264-1

Page 1 of 2

Sample Number	2595461-1
Sampled Date	Oct 21, 2025
Sample Description	Emission from Stationary Source
Location	ปล่อง HRSG 11
Date Analysis Commenced	Oct 24, 2025
Condition of Sample	Extracted into one filter paper placed in plastic petri dish and one plastic bottle

Stack Description

Ambient Pressure	749	mmHg	Diameter	3.00	m	Oxygen	14.4	%
Ambient Temperature	31.2	°C	Shape	Circle		Carbon Dioxide	3.7	%
Type of Process	Combustion		Stack Temperature	109	°C	Gas Velocity	15.8	m/s
Type of Fuel	Natural Gas		Moisture	9.03	%	Flow Rate (Actual O2)	281770	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result at 7 %O ₂	Result at 14.4 % O ₂	Guideline (1)	Guideline (2)	Method	Testing Location
---------	--------------	------	-----	-----------	-----------------------------	---------------------------------	---------------	---------------	--------	------------------

Air Testing

Total Suspended Particulate	11:30 AM - 12:18 PM	mg/m3	-	0.5	<0.5	<0.5	28	60	U.S. Environmental Protection Agency 40 CFR method 5, Appendix A, December 7, 2020 (Include sampling)	Rayong
-----------------------------	---------------------	-------	---	-----	------	------	----	----	---	--------

Guideline :

Guideline (1) Environmental Impact Assessment Report of Gulf TS4 Co., Ltd.

Guideline (2) Notification of the Ministry of Natural Resources and Environment, 2023 (B.E. 2566) on Emission Standard from Power Plants.

Technical Management

Thanitak.

Thanita Kulsuriwong
Scientist (4)

ทะเบียนเลขที่ ว-323-จ-0029

Approved by

D. Chamon.

Dej Changchon
Senior Manager

ทะเบียนเลขที่ ว-323-จ-0001

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13431-61/ EMAIL

S:\Reports_Air Stack_O2_2GL.rpt (3:03PM)



Analysis / Test Report



Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O : 4210502708

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595461

Date Received : Oct 22, 2025

Date Reported : Oct 30, 2025

Report Number: 3427264-1

Page 2 of 2

Sample Number	2595461-1
Sampled Date	Oct 21, 2025
Sample Description	Emission from Stationary Source
Location	ปล่อง HRSG 11
Date Analysis Commenced	Oct 24, 2025
Condition of Sample	Extracted into one filter paper placed in plastic petri dish and one plastic bottle

Stack Description

Ambient Pressure	749	mmHg	Diameter	3.00	m	Oxygen	14.4	%
Ambient Temperature	31.2	°C	Shape	Circle		Carbon Dioxide	3.7	%
Type of Process	Combustion		Stack Temperature	109	°C	Gas Velocity	15.8	m/s
Type of Fuel	Natural Gas		Moisture	9.03	%	Flow Rate (Actual O2)	281770	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result Emission Rate	Guideline (1)	Guideline (2)	Method	Testing Location
---------	--------------	------	-----	-----------	----------------------	---------------	---------------	--------	------------------

Air Testing

Total Suspended Particulate	11:30 AM - 12:18 PM	g/s	-	-	<0.039	1.8	-	Calculated	Rayong
-----------------------------	---------------------	-----	---	---	--------	-----	---	------------	--------

*

Guideline :

Guideline (1) Environmental Impact Assessment Report of Gulf TS4 Co., Ltd.

Guideline (2) Notification of the Ministry of Natural Resources and Environment, 2023 (B.E. 2566) on Emission Standard from Power Plants.

Sampling By : Tinnakorn Kulchart ทะเบียนเลขที่ ว-323-จ-0062

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

Thanitak.

Thanita Kulsuriwong
Scientist (4)

ทะเบียนเลขที่ ว-323-จ-0029

Approved by

D. Chamon.

Dej Changchon
Senior Manager

ทะเบียนเลขที่ ว-323-จ-0001

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S:\Reports_Air Stack_O2_2GL.rpt (3:03PM)



Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140

P/O : 4210502708

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595460

Date Received : Oct 21, 2025

Date Reported : Oct 30, 2025

Report Number : 3427263-1

Page 1 of 1

Sample Number	2595460-1							
Sample Description	Emission from Stationary Source							
Location	ปล่อง HRSG 12							
Sampled Date	Oct 21, 2025							
Stack Description								
Ambient Temperature	31.2	°C	Diameter	3.00	m	Oxygen	14.06	%
Ambient Pressure	749	mmHg	Shape	Circle		Carbon dioxide	3.72	%
Type of Process	Combustion		Stack Temperature	114	°C	Gas Velocity	16.62	m/s
Type of Fuel	Natural Gas		Moisture	10.11	%	Flow Rate	288337	Nm3/hr

Run No.	Sampling Time	Oxygen (%)	Carbon Dioxide (%)	Oxides of Nitrogen (ppm)		Sulfur Dioxide (ppm)	
				at Actual O ₂	at 7% O ₂	at Actual O ₂	at 7% O ₂
1	11:00 AM - 11:20 AM	14.02	3.74	18.44	37.27	0.16	0.32
2	11:21 AM - 11:41 AM	14.06	3.71	18.20	37.00	0.17	0.34
3	11:42 AM - 12:02 PM	14.10	3.70	17.05	34.87	0.16	0.33
Average (ppm)		14.06	3.72	17.90	36.38	0.16	0.33
Guideline ^{1/} (ppm)				-	60	-	6
Guideline ^{2/} (ppm)				-	120	-	20
Result (mg/Nm ³)				33.67	68.45	0.42	0.86
Emission Rate at Actual O ₂ (g/s)				2.6970		0.0337	
Guideline ^{1/} (g/s)				7.4		1.0	
Method				US EPA Method 7E		US EPA Method 6C	

Sampled By : Naratip Thueakchaikam

Guideline : ^{1/}Environmental Impact Assessment Report of Gulf TS4 Co., Ltd.

^{2/}Notification of the Ministry of Natural Resources and Environment, 2023 (B.E. 2566) on Emission Standard from Power Plants.

Technical Management

Wichan Choonharat
Manager
ทะเบียนเลขที่ ว-204-ค-0006

Approved by

Sarayuth Jittranont
Assistant General Manager
ทะเบียนเลขที่ ว-204-ค-0003

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140

P/O : 4210502708

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595460

Date Received : Oct 21, 2025

Date Reported : Oct 30, 2025

Report Number : 3427263-1

Page 1 of 1

Sample Number	2595460-1							
Sample Description	Emission from Stationary Source							
Location	ปล่อง HRSG 12							
Sampled Date	Oct 21, 2025							
Stack Description								
Ambient Temperature	31.2	°C	Diameter	3.00	m	Oxygen	14.06	%
Ambient Pressure	749	mmHg	Shape	Circle		Carbon dioxide	3.72	%
Type of Process	Combustion		Stack Temperature	114	°C	Gas Velocity	16.62	m/s
Type of Fuel	Natural Gas		Moisture	10.11	%	Flow Rate	288337	Nm3/hr

Run No.	Sampling Time	Oxygen (%)	Carbon Dioxide (%)	Carbon Monoxide (ppm)	
				at Actual O ₂	At 7% O ₂
1	11:00 AM - 11:20 AM	14.02	3.74	1.07	2.17
2	11:21 AM - 11:41 AM	14.06	3.71	0.96	1.95
3	11:42 AM - 12:02 PM	14.10	3.70	0.84	1.71
Average (ppm)		14.06	3.72	0.96	1.94
Guideline (ppm)				-	690
Result (mg/Nm ³)				1.10	2.23
Emission Rate at Actual O ₂ (g/s)				0.0878	
Method				US EPA Method 10	

Sampled By : Naratip Thueakchaikam

Guideline : Notification of the Ministry of Industry 2006 (B.E. 2549) Published in the Royal Government Gazette, Vol.123 Special Part 125 D, dated December 4, 2006 (B.E. 2549)

Technical Management

Wichan Choonharat
Manager
ทะเบียนเลขที่ ว-204-ค-0006

Approved by

Sarayuth Jittranont
Assistant General Manager
ทะเบียนเลขที่ ว-204-ค-0003

The above results are valid only for the analyzed/tested sample(s) as indicated in this report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

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Analysis / Test Report



Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O : 4210502708

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595462

Date Received : Oct 21, 2025

Date Reported : Oct 30, 2025

Report Number: 3427265-1

Page 1 of 2

1amSle Npmuer	2595462-1
1amSleb Date	Oct 21, 2025
1amSle DedcriStion	Emission from Stationary Source
Location	ปล่อง HRSG 12
Date s naAdid Commenceb	Oct 22, 2025
Conbition oy 1amSle	Extracted into one filter paper placed in plastic petri dish and one plastic bottle

1tacf DedcriStion

Ambient Pressure	749	mmHg	Diameter	3.00	m	Oxygen	14.1	%
Ambient Temperature	31.2	°C	Shape	Circle		Carbon Dioxide	3.7	%
Type of Process	Combustion		Stack Temperature	114	°C	Gas Velocity	16.6	m/s
Type of Fuel	Natural Gas		Moisture	10.10	%	Flow Rate (Actual O2)	288720	Nm3/hr

s naIate	1amSleb kime	Unit	LOD	LOQ GLO%	%edpIt at T 7 O ₂ at (4. (7 O ₂	Rpibeline ()	Rpibeline ()	Methob	kedting Location
----------	--------------	------	-----	-------------	--	------------------	------------------	--------	---------------------

sir kedting

Total Suspended Particulate	11:00 AM - 11:50 AM	mg/m3	-	0.5	<0.5	<0.5	28	60	U.S. Environmental Protection Agency 40 CFR method 5, Appendix A, December 7, 2020 (Include sampling)	Rayong
-----------------------------	---------------------	-------	---	-----	------	------	----	----	---	--------

Rpibeline :

Guideline (1) Environmental Impact Assessment Report of Gulf TS4 Co., Ltd.

Guideline (2) Notification of the Ministry of Natural Resources and Environment, 2023 (B.E. 2566) on Emission Standard from Power Plants.

kechnical Management

Thanita K.

Thanita Kulsuriwong
Scientist (4)

ทะเบียนเลขที่ ว-323-จ-0029

sSSroveb uA

D. J.

Dej Changchon
Senior Manager

ทะเบียนเลขที่ ว-323-จ-0001

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report may be reproduced in any form without written consent from the laboratory.
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S:\Reports_Air Stack_O2_2GL.rpt (11:07AM)



Analysis / Test Report



Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O : 4210502708

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595462

Date Received : Oct 21, 2025

Date Reported : Oct 30, 2025

Report Number: 3427265-1

Page 2 of 2

1amSle Npmuer	2595462-1
1amSleb Date	Oct 21, 2025
1amSle DedcriStion	Emission from Stationary Source
Location	ปล่อง HRSG 12
Date s naAdid Commenceb	Oct 22, 2025
Conbition oy 1amSle	Extracted into one filter paper placed in plastic petri dish and one plastic bottle

1tacf DedcriStion

Ambient Pressure	749	mmHg	Diameter	3.00	m	Oxygen	14.1	%
Ambient Temperature	31.2	°C	Shape	Circle		Carbon Dioxide	3.7	%
Type of Process	Combustion		Stack Temperature	114	°C	Gas Velocity	16.6	m/s
Type of Fuel	Natural Gas		Moisture	10.10	%	Flow Rate (Actual O2)	288720	Nm3/hr

s naIate	1amSleb kime	Unit	LOD	LOQ GLO%	%edpIt Emiddion %ate	Rpibeline ()	Rpibeline ()	Methob	kedting Location
----------	--------------	------	-----	-------------	-------------------------	------------------	------------------	--------	---------------------

sir kedting

Total Suspended Particulate	11:00 AM - 11:50 AM	g/s	-	-	<0.040	1.8	-	Calculated	Rayong
-----------------------------	---------------------	-----	---	---	--------	-----	---	------------	--------

*

Rpibeline :

Guideline (1) Environmental Impact Assessment Report of Gulf TS4 Co., Ltd.

Guideline (2) Notification of the Ministry of Natural Resources and Environment, 2023 (B.E. 2566) on Emission Standard from Power Plants.

1amSling BA : Sutdamrong Chokpitinan ทะเบียนเลขที่ ว-323-จ-0037

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.

kechnical Management

Thanita K.

Thanita Kulsuriwong
Scientist (4)

ทะเบียนเลขที่ ว-323-จ-0029

sSSroveb uA

D. J.

Dej Changchon
Senior Manager

ทะเบียนเลขที่ ว-323-จ-0001

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report may be reproduced in any form without written consent from the laboratory.
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ภาคผนวก ค-3

ระดับเสียงโดยทั่วไป



Analysis / Test Report



Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O : 4210502708

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595463

Date Received : Oct 29, 2025

Date Reported : Nov 04, 2025

Report Number: 3441916-1

Page 1 of 1

Sample Number 2595463-1
Parameter Noise (Leq 24 hrs.)
Location บริเวณรั้วโครงการ (GPS 47P 0736946, 1445408)
Measurement Date Oct 20 - Oct 21, 2025
Measurement by Anurak Tongkhajonsakda
Sound Level meter Serial No. 623396

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
10:00 AM - 11:00 AM	61.3	77.0	60.7
11:00 AM - 12:00 PM	61.3	67.4	60.6
12:00 PM - 01:00 PM	60.8	69.4	60.1
01:00 PM - 02:00 PM	61.6	68.0	60.9
02:00 PM - 03:00 PM	61.4	66.9	60.8
03:00 PM - 04:00 PM	61.0	68.5	60.0
04:00 PM - 05:00 PM	61.5	69.2	60.5
05:00 PM - 06:00 PM	61.4	73.0	60.6
06:00 PM - 07:00 PM	61.5	65.7	60.9
07:00 PM - 08:00 PM	61.3	64.4	60.7
08:00 PM - 09:00 PM	63.2	87.6	61.4
09:00 PM - 10:00 PM	63.9	84.0	61.9
10:00 PM - 11:00 PM	63.3	66.2	62.5
11:00 PM - 12:00 AM	62.7	66.3	62.0
12:00 AM - 01:00 AM	63.5	65.1	63.0
01:00 AM - 02:00 AM	63.7	66.8	63.2
02:00 AM - 03:00 AM	63.5	65.6	63.0
03:00 AM - 04:00 AM	63.4	66.5	62.9
04:00 AM - 05:00 AM	63.4	65.5	62.9
05:00 AM - 06:00 AM	63.3	69.0	62.7
06:00 AM - 07:00 AM	63.4	72.7	62.8
07:00 AM - 08:00 AM	62.6	66.6	61.9
08:00 AM - 09:00 AM	62.0	65.4	61.4
09:00 AM - 10:00 AM	62.1	68.0	61.3

Leq Average 24 hrs. (dB(A)) 62.5
Lmax (dB(A)) 87.6
L90 (dB(A)) 61.4
Ldn (dB(A)) 69.6
Standard (dB(A)) 70

Reference Method : ISO 1996-1 : 2016

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak

Chonticha Subongkoch
Scientist (3)

Approved by

Supot S

Supot Salamteh
Section Head

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Analysis / Test Report



Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O : 4210502708

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595463

Date Received : Oct 29, 2025

Date Reported : Nov 04, 2025

Report Nu- ber: 344191761

Page 1 of 1

Sample Number 25954m862
Parameter Noise (Leq 24 hrs.)
Location บริเวณรั้วโครงการ (GPS 47P 073m94m 1445408)
Measurement Date Oct 21 6Oct 22, 2025
Measurement by Anurak Tongkhajonsakda
Sound Level meter Serial No. n2339m

TI- e	Leq (dB(A))	L- ax (dB(A))	L90 (dB(A))
10:00 AM 611:00 AM	m1.9	82.1	m1.0
11:00 AM 612:00 PM	m1.5	88.7	m0.m
12:00 PM 601:00 PM	m0.8	75.5	59.9
01:00 PM 602:00 PM	m1.2	72.0	m0.5
02:00 PM 603:00 PM	m1.1	73.2	m0.4
03:00 PM 604:00 PM	m1.2	73.8	m0.5
04:00 PM 605:00 PM	m1.1	73.1	m0.5
05:00 PM 60m00 PM	m1.5	73.1	m0.9
0m00 PM 607:00 PM	m1.7	mm5	m1.2
07:00 PM 608:00 PM	m1.7	m5.5	m1.2
08:00 PM 609:00 PM	m1.8	m1.2	m1.3
09:00 PM 610:00 PM	m2.0	7m1	m1.5
10:00 PM 611:00 PM	m2.3	m5.2	m1.8
11:00 PM 612:00 AM	m2.1	m1.9	m1.5
12:00 AM 601:00 AM	m2.4	m1.4	m1.7
01:00 AM 602:00 AM	m2.4	m5.4	m1.8
02:00 AM 603:00 AM	m2.2	m1.5	m1.7
03:00 AM 604:00 AM	m2.4	m7.8	m1.8
04:00 AM 605:00 AM	m2.3	7m3	m1.m
05:00 AM 60m00 AM	m2.5	7m8	m1.7
0m00 AM 607:00 AM	m2.m	7m0	m2.0
07:00 AM 608:00 AM	m2.1	80.1	m1.3
08:00 AM 609:00 AM	m2.1	75.9	m1.2
09:00 AM 610:00 AM	m2.2	85.0	m1.1

Leq Average 24 hrs. (dB(A)) m1.9
L- ax (dB(A)) 88.7
L90 (dB(A)) m1.2
Ldn (dB(A)) m8.7
Standard (dB(A)) 70

Reference Method : ISO 1996-1 : 201m

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Re- ark : The laboratory has been accepted as an accredited laboratory co- pling with the ISO/IEC 17025.

Technical Management

Chontichak

Chonticha Subongkoch
Scientist (3)

Approved by

Supot S

Supot Sala- teh
Section Head

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Analysis / Test Report



Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O : 4210502708

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595463

Date Received : Oct 29, 2025

Date Reported : Nov 04, 2025

Report Nu- ber: 344191961

Page 1 of 1

Sample Number 25954m864
Parameter Noise (Leq 24 hrs.)
Location บริเวณรั้วโครงการ (GPS 47P 073m94m 1445408)
Measurement Date Oct 22 6Oct 23, 2025
Measurement by Anurak Tongkhajonsakda
Sound Level meter Serial No. m2339m

TI- e	Leq (dB(A))	L- ax (dB(A))	L90 (dB(A))
10:00 AM 611:00 AM	m2.3	82.7	m1.2
11:00 AM 612:00 PM	m2.0	8m2	m0.m
12:00 PM 601:00 PM	m1.3	83.7	m0.1
01:00 PM 602:00 PM	m1.m	74.2	m0.m
02:00 PM 603:00 PM	m1.8	83.m	m0.7
03:00 PM 604:00 PM	m1.2	77.4	m0.3
04:00 PM 605:00 PM	m1.3	75.7	m0.4
05:00 PM 60m00 PM	m1.2	74.7	m0.m
0m00 PM 607:00 PM	m1.4	70.3	m0.9
07:00 PM 608:00 PM	m1.7	74.1	m1.1
08:00 PM 609:00 PM	m2.0	75.0	m1.4
09:00 PM 610:00 PM	m2.0	70.8	m1.4
10:00 PM 611:00 PM	m2.1	73.m	m1.5
11:00 PM 612:00 AM	m2.4	73.m	m1.m
12:00 AM 601:00 AM	m2.3	77.5	m1.m
01:00 AM 602:00 AM	m2.3	77.1	m1.5
02:00 AM 603:00 AM	m2.8	m7.4	m2.9
03:00 AM 604:00 AM	m2.5	73.8	m2.8
04:00 AM 605:00 AM	m2.7	84.3	m2.7
05:00 AM 60m00 AM	m2.3	70.9	m2.7
0m00 AM 607:00 AM	m2.7	71.7	m2.0
07:00 AM 608:00 AM	mm3	79.1	m2.5
08:00 AM 609:00 AM	m2.7	7m5	m2.4
09:00 AM 610:00 AM	m2.9	83.9	m2.m

Leq Average 24 hrs. (dB(A)) m2.8
L- ax (dB(A)) 8m2
L90 (dB(A)) m1.4
Ldn (dB(A)) m9.5
Standard (dB(A)) 70 115

Reference Method : ISO 199m61 : 201m

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Re- ark : The laboratory has been accepted as an accredited laboratory co- pling with the ISO/IEC 17025.

Technical Management

Chontichak

Chonticha Subongkoch
Scientist (3)

Approved by

Supt S

Supot Sala- teh
Section Head

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S:\Reports_Air Noise.rpt (11:56AM)



Analysis / Test Report



Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O : 4210502708

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595463

Date Received : Oct 29, 2025

Date Reported : Nov 04, 2025

Report Nu- ber: 344191961

Page 1 of 1

Sample Number 25954m864
Parameter Noise (Leq 24 hrs.)
Location บริเวณรั้วโครงการ (GPS 47P 073m94m 1445408)
Measurement Date Oct 23 6Oct 24, 2025
Measurement by Anurak Tongkhajonsakda
Sound Level meter Serial No. m2339m

TI- e	Leq (dB(A))	L- ax (dB(A))	L90 (dB(A))
10:00 AM 611:00 AM	m2.8	82.8	m2.m
11:00 AM 612:00 PM	m2.4	77.7	m2.3
12:00 PM 601:00 PM	m2.7	74.0	m1.8
01:00 PM 602:00 PM	m2.1	7m3	m2.2
02:00 PM 603:00 PM	m2.2	77.1	m1.0
03:00 PM 604:00 PM	m1.m	72.9	m0.7
04:00 PM 605:00 PM	m1.9	70.2	m1.0
05:00 PM 60m00 PM	m1.9	74.9	m1.2
0m00 PM 607:00 PM	m1.8	74.7	m1.2
07:00 PM 608:00 PM	m2.2	m5.m	m1.5
08:00 PM 609:00 PM	m2.2	m7.5	m1.7
09:00 PM 610:00 PM	m2.3	m8.8	m1.8
10:00 PM 611:00 PM	m2.3	mm7	m2.m
11:00 PM 612:00 AM	m2.2	mmmm	m2.5
12:00 AM 601:00 AM	m2.m	mmmm	m2.0
01:00 AM 602:00 AM	m2.m	mm5	m2.0
02:00 AM 603:00 AM	m2.5	mm1	m2.8
03:00 AM 604:00 AM	m2.4	m7.0	m2.7
04:00 AM 605:00 AM	m2.2	mm4	m2.5
05:00 AM 60m00 AM	m2.2	70.1	m2.m
0m00 AM 607:00 AM	m2.2	73.2	m2.m
07:00 AM 608:00 AM	m2.5	7m9	m1.8
08:00 AM 609:00 AM	m2.4	83.4	m2.2
09:00 AM 610:00 AM	m2.7	78.9	m2.4

Leq Average 24 hrs. (dB(A)) m2.0
L- ax (dB(A)) 83.4
L90 (dB(A)) m2.3
Ldn (dB(A)) m9.7
Standard (dB(A)) 70 115

Reference Method : ISO 199m61 : 201m

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Re- ark : The laboratory has been accepted as an accredited laboratory co- pling with the ISO/IEC 17025.

Technical Management

Chontichak

Chonticha Subongkoch
Scientist (3)

Approved by

Supt S

Supot Sala- teh
Section Head

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Analysis / Test Report



Lot ID: 2595463

Date Reported : Oct 29, 2025

Date Reported : Nov 04, 2025

Report Nu- ber: 344192061

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O : 4210502708

Project Name : Monitoring EIA

Project Location : GTS4

Page 1 of 1

Sample Number 25954m86m
Parameter Noise (Leq 24 hrs.)
Location บริเวณรั้วโครงการ (GPS 47P 073m94m 1445408)
Measurement Date Oct 24 6Oct 25, 2025
Measurement by Anurak Tongkhajonsakda
Sound Level meter Serial No. m2339m

TI- e	Leq (dB(A))	L- ax (dB(A))	L90 (dB(A))
10:00 AM 611:00 AM	m2.9	m7.4	m2.2
11:00 AM 612:00 PM	m2.9	m1.9	m1.9
12:00 PM 601:00 PM	m1.7	79.4	m0.m
01:00 PM 602:00 PM	m1.m	72.2	m0.5
02:00 PM 603:00 PM	m2.4	70.3	m1.2
03:00 PM 604:00 PM	m2.1	m9.5	m1.1
04:00 PM 605:00 PM	m1.8	71.4	m1.0
05:00 PM 60m00 PM	m1.7	78.4	m0.8
0m00 PM 607:00 PM	m1.m	m9.0	m0.9
07:00 PM 608:00 PM	m1.3	m4.0	m0.8
08:00 PM 609:00 PM	m1.5	mm7	m0.9
09:00 PM 610:00 PM	m1.7	m4.1	m1.1
10:00 PM 611:00 PM	m1.9	m5.5	m1.3
11:00 PM 612:00 AM	m1.9	m4.4	m1.3
12:00 AM 601:00 AM	m2.4	m9.2	m1.8
01:00 AM 602:00 AM	m2.1	m5.4	m1.5
02:00 AM 603:00 AM	m2.2	m5.3	m1.m
03:00 AM 604:00 AM	m2.1	m4.5	m1.m
04:00 AM 605:00 AM	m2.3	m5.2	m1.8
05:00 AM 60m00 AM	m2.4	70.2	m1.8
0m00 AM 607:00 AM	m2.3	70.9	m1.7
07:00 AM 608:00 AM	m2.5	m7.5	m1.9
08:00 AM 609:00 AM	m2.3	72.1	m1.m
09:00 AM 610:00 AM	m2.1	70.7	m1.9

Leq Average 24 hrs. (dB(A))

L- ax (dB(A))

L90 (dB(A))

Ldn (dB(A))

Standard (dB(A))

Reference Method : ISO 199m61 : 201m

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
 2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Re- ark : The laboratory has been accepted as an accredited laboratory co- pling with the ISO/IEC 17025.

Technical Management

Chontichak

Chonticha Subongkoch
Scientist (3)

Approved by

Supot S

Supot Sala- teh
Section Head

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S:\Reports\Air Noise.rpt (11:56AM)



Analysis / Test Report



Lot ID: 2595463

Date Reported : Oct 29, 2025

Date Reported : Nov 04, 2025

Report Nu- ber: 344192161

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O : 4210502708

Project Name : Monitoring EIA

Project Location : GTS4

Page 1 of 1

Sample Number 25954m86m
Parameter Noise (Leq 24 hrs.)
Location บริเวณรั้วโครงการ (GPS 47P 073m94m 1445408)
Measurement Date Oct 25 6Oct 2m 2025
Measurement by Anurak Tongkhajonsakda
Sound Level meter Serial No. m2339m

TI- e	Leq (dB(A))	L- ax (dB(A))	L90 (dB(A))
10:00 AM 611:00 AM	m2.9	m7.9	m1.5
11:00 AM 612:00 PM	m2.5	74.1	m1.2
12:00 PM 601:00 PM	m1.4	72.9	m0.m
01:00 PM 602:00 PM	m2.1	72.7	m0.5
02:00 PM 603:00 PM	m2.4	78.1	m1.2
03:00 PM 604:00 PM	m2.5	73.2	m1.2
04:00 PM 605:00 PM	m2.5	75.8	m1.2
05:00 PM 60m00 PM	m2.8	74.5	m1.4
0m00 PM 607:00 PM	m1.7	73.5	m0.9
07:00 PM 608:00 PM	m1.m	m5.3	m1.0
08:00 PM 609:00 PM	m1.3	m4.1	m0.9
09:00 PM 610:00 PM	m1.m	m7.m	m1.1
10:00 PM 611:00 PM	m1.7	m8.1	m1.2
11:00 PM 612:00 AM	m1.8	m8.8	m1.3
12:00 AM 601:00 AM	m2.4	m7.3	m1.5
01:00 AM 602:00 AM	m2.2	m4.9	m1.7
02:00 AM 603:00 AM	m2.2	m5.7	m1.m
03:00 AM 604:00 AM	m2.2	m4.8	m1.m
04:00 AM 605:00 AM	m2.3	m4.8	m1.7
05:00 AM 60m00 AM	m1.9	m7.5	m1.3
0m00 AM 607:00 AM	m1.8	mm1	m1.3
07:00 AM 608:00 AM	m1.8	74.9	m1.3
08:00 AM 609:00 AM	m1.5	m5.0	m0.9
09:00 AM 610:00 AM	m2.5	77.9	m1.2

Leq Average 24 hrs. (dB(A))

L- ax (dB(A))

L90 (dB(A))

Ldn (dB(A))

Standard (dB(A))

Reference Method : ISO 199m61 : 201m

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
 2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Re- ark : The laboratory has been accepted as an accredited laboratory co- pling with the ISO/IEC 17025.

Technical Management

Chontichak

Chonticha Subongkoch
Scientist (3)

Approved by

Supot S

Supot Sala- teh
Section Head

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S:\Reports\Air Noise.rpt (11:57AM)



Analysis / Test Report



Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O : 4210502708

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595463

Date Received : Oct 29, 2025

Date Reported : Nov 04, 2025

Report Nu- ber: 344192261

Page 1 of 1

Sample Number 25954n867
Parameter Noise (Leq 24 hrs.)
Location บริเวณรั้วโครงการ (GPS 47P 073n94m 1445408)
Measurement Date Oct 2m6Oct 27, 2025
Measurement by Anurak Tongkhajonsakda
Sound Level meter Serial No. n2339m

TI- e	Leq (dB(A))	L- ax (dB(A))	L90 (dB(A))
10:00 AM 611:00 AM	n2.1	72.8	n0.9
11:00 AM 612:00 PM	n1.7	74.9	n0.m
12:00 PM 601:00 PM	n1.0	73.9	n0.1
01:00 PM 602:00 PM	n0.8	77.1	59.9
02:00 PM 603:00 PM	n1.5	73.9	n0.3
03:00 PM 604:00 PM	n1.4	73.7	n0.4
04:00 PM 605:00 PM	n1.7	7m9	n0.5
05:00 PM 60m00 PM	n2.7	7m3	n1.2
0m00 PM 607:00 PM	n1.3	70.3	n0.m
07:00 PM 608:00 PM	n1.4	n5.2	n0.8
08:00 PM 609:00 PM	n1.4	n4.3	n0.8
09:00 PM 610:00 PM	n1.m	n5.8	n1.0
10:00 PM 611:00 PM	n1.8	n4.m	n1.1
11:00 PM 612:00 AM	n2.0	nm4	n1.1
12:00 AM 601:00 AM	n1.2	n2.2	n0.7
01:00 AM 602:00 AM	n1.3	n2.0	n0.9
02:00 AM 603:00 AM	n1.4	n4.5	n0.9
03:00 AM 604:00 AM	n1.5	n2.3	n1.1
04:00 AM 605:00 AM	n1.7	n4.5	n1.2
05:00 AM 60m00 AM	n1.5	n2.4	n1.1
0m00 AM 607:00 AM	n1.m	n7.1	n1.1
07:00 AM 608:00 AM	n1.8	71.1	n1.2
08:00 AM 609:00 AM	n1.7	n6.5	n1.1
09:00 AM 610:00 AM	n2.8	73.9	n1.7

Leq Average 24 hrs. (dB(A))

L- ax (dB(A))

L90 (dB(A))

Ldn (dB(A))

Standard (dB(A))

Reference Method : ISO 199n61 : 201m

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการ
โรงงาน พ.ศ. 2548

Re- ark : The laboratory has been accepted as an accredited laboratory co- plying with the ISO/IEC 17025.

Technical Management

Chontichak

Chonticha Subongkoch
Scientist (3)

Approved by

Supt S

Supot Sala- teh
Section Head

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S:\Reports_Air Noise.rpt (11:57AM)



Analysis / Test Report



Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595458

Date Received : Oct 29, 2025

Date Reported : Nov 06, 2025

Report Number: 3441876-1C6

Page 1 of 1

Sample Number 2595458-8
Parameter Noise (Leq 24 hrs.)
Location โรงเรียนบ้านสุรศักดิ์ (GPS 47P 0735491, 1445328)
Measurement Date Oct 20 - Oct 21, 2025
Measurement by Anurak Tongkhajonsakda
Sound Level meter Serial No. 623393

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
12:00 PM - 01:00 PM	59.8	81.4	49.1
01:00 PM - 02:00 PM	60.6	84.4	50.2
02:00 PM - 03:00 PM	59.8	81.3	52.5
03:00 PM - 04:00 PM	59.7	82.9	52.8
04:00 PM - 05:00 PM	59.9	79.5	53.1
05:00 PM - 06:00 PM	60.4	82.3	53.4
06:00 PM - 07:00 PM	60.1	84.6	50.4
07:00 PM - 08:00 PM	58.6	79.3	48.7
08:00 PM - 09:00 PM	59.2	85.4	49.5
09:00 PM - 10:00 PM	69.0	86.1	52.8
10:00 PM - 11:00 PM	55.5	77.0	46.6
11:00 PM - 12:00 AM	52.8	72.5	45.0
12:00 AM - 01:00 AM	51.9	73.7	43.7
01:00 AM - 02:00 AM	48.2	65.7	43.9
02:00 AM - 03:00 AM	50.2	69.6	45.4
03:00 AM - 04:00 AM	51.7	74.6	44.0
04:00 AM - 05:00 AM	48.8	74.1	43.8
05:00 AM - 06:00 AM	54.1	75.0	45.5
06:00 AM - 07:00 AM	60.9	87.7	52.0
07:00 AM - 08:00 AM	63.2	91.1	55.7
08:00 AM - 09:00 AM	60.7	75.6	54.0
09:00 AM - 10:00 AM	61.5	83.8	50.8
10:00 AM - 11:00 AM	59.6	84.2	49.1
11:00 AM - 12:00 PM	58.7	79.6	49.0

Leq Average 24 hrs. (dB(A))

Lmax (dB(A))

L90 (dB(A))

Ldn (dB(A))

Standard (dB(A))

Reference Method : ISO 1996-1 : 2016

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการ
โรงงาน พ.ศ. 2548

Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak

Chonticha Subongkoch
Scientist (3)

Approved by

Supt S

Supot Salamteh
Section Head

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Analysis / Test Report



Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595458

Date Received : Oct 29, 2025

Date Reported : Nov 06, 2025

Report Number: 3441877-1C6

Page 1 of 1

Sample Number 2595458-9
Parameter Noise (Leq 24 hrs.)
Location โรงเรียนบ้านสุรศักดิ์ (GPS 47P 0735491, 1445328)
Measurement Date Oct 21 - Oct 22, 2025
Measurement by Anurak Tongkhajonsakda
Sound Level meter Serial No. 623393

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
12:00 PM - 01:00 PM	57.8	81.6	47.4
01:00 PM - 02:00 PM	56.6	81.4	46.1
02:00 PM - 03:00 PM	58.1	81.1	46.5
03:00 PM - 04:00 PM	58.2	81.9	48.2
04:00 PM - 05:00 PM	58.9	78.7	50.7
05:00 PM - 06:00 PM	61.6	84.5	53.3
06:00 PM - 07:00 PM	60.9	83.9	50.9
07:00 PM - 08:00 PM	60.5	83.2	51.5
08:00 PM - 09:00 PM	58.7	80.6	50.0
09:00 PM - 10:00 PM	57.1	79.3	47.6
10:00 PM - 11:00 PM	56.2	84.2	46.1
11:00 PM - 12:00 AM	53.7	74.0	44.7
12:00 AM - 01:00 AM	52.6	77.7	44.2
01:00 AM - 02:00 AM	47.6	70.4	43.6
02:00 AM - 03:00 AM	48.6	71.9	43.8
03:00 AM - 04:00 AM	54.2	88.2	44.8
04:00 AM - 05:00 AM	49.4	72.0	44.7
05:00 AM - 06:00 AM	52.9	70.3	45.9
06:00 AM - 07:00 AM	60.3	78.9	51.3
07:00 AM - 08:00 AM	62.9	86.6	55.0
08:00 AM - 09:00 AM	61.6	79.8	54.3
09:00 AM - 10:00 AM	60.9	82.7	53.2
10:00 AM - 11:00 AM	61.2	82.8	51.2
11:00 AM - 12:00 PM	60.2	83.1	50.6

Leq Average 24 hrs. (dB(A)) 58.7
Lmax (dB(A)) 88.2
L90 (dB(A)) 47.6
Ldn (dB(A)) 62.3
Standard (dB(A)) 70

Reference Method : ISO 1996-1 : 2016

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak

Chonticha Subongkoch
Scientist (3)

Approved by

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Supot Salamteh
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Analysis / Test Report



Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595458

Date Received : Oct 29, 2025

Date Reported : Nov 06, 2025

Report Number: 3441878-1C6

Page 1 of 1

Sample Number 2595458-10
Parameter Noise (Leq 24 hrs.)
Location โรงเรียนบ้านสุรศักดิ์ (GPS 47P 0735491, 1445328)
Measurement Date Oct 22 - Oct 23, 2025
Measurement by Anurak Tongkhajonsakda
Sound Level meter Serial No. 623393

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
12:00 PM - 01:00 PM	61.9	85.4	52.6
01:00 PM - 02:00 PM	59.4	81.4	50.1
02:00 PM - 03:00 PM	59.9	80.9	50.5
03:00 PM - 04:00 PM	59.3	78.6	50.7
04:00 PM - 05:00 PM	59.8	76.7	50.7
05:00 PM - 06:00 PM	59.7	80.4	53.0
06:00 PM - 07:00 PM	60.5	84.7	51.1
07:00 PM - 08:00 PM	60.2	81.7	51.3
08:00 PM - 09:00 PM	60.3	84.8	50.1
09:00 PM - 10:00 PM	57.9	83.8	47.3
10:00 PM - 11:00 PM	55.0	80.0	46.4
11:00 PM - 12:00 AM	51.9	74.3	45.7
12:00 AM - 01:00 AM	50.6	72.8	45.2
01:00 AM - 02:00 AM	55.5	90.3	45.4
02:00 AM - 03:00 AM	51.9	86.9	44.4
03:00 AM - 04:00 AM	49.8	77.3	44.3
04:00 AM - 05:00 AM	50.2	72.6	44.7
05:00 AM - 06:00 AM	53.0	72.3	45.5
06:00 AM - 07:00 AM	59.3	83.6	51.0
07:00 AM - 08:00 AM	62.9	85.7	53.8
08:00 AM - 09:00 AM	59.8	78.9	50.8
09:00 AM - 10:00 AM	60.2	83.4	50.5
10:00 AM - 11:00 AM	58.9	81.3	50.7
11:00 AM - 12:00 PM	59.0	80.2	51.4

Leq Average 24 hrs. (dB(A)) 58.7
Lmax (dB(A)) 90.3
L90 (dB(A)) 50.5
Ldn (dB(A)) 62.1
Standard (dB(A)) 70

Reference Method : ISO 1996-1 : 2016

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak

Chonticha Subongkoch
Scientist (3)

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Supot Salamteh
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Analysis / Test Report



Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595458

Date Received : Oct 29, 2025

Date Reported : Nov 06, 2025

Report Number: 3441879-1C6

Page 1 of 1

Sample Number 2595458-11
Parameter Noise (Leq 24 hrs.)
Location โรงเรือนบ้านสุรศักดิ์ (GPS 47P 0735491, 1445328)
Measurement Date Oct 23 - Oct 24, 2025
Measurement by Anurak Tongkhajonsakda
Sound Level meter Serial No. 623393

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
12:00 PM - 01:00 PM	60.5	85.0	49.6
01:00 PM - 02:00 PM	57.9	79.7	48.9
02:00 PM - 03:00 PM	58.9	83.8	48.5
03:00 PM - 04:00 PM	58.3	79.5	49.5
04:00 PM - 05:00 PM	57.8	76.8	49.7
05:00 PM - 06:00 PM	60.3	82.6	52.7
06:00 PM - 07:00 PM	60.6	84.4	51.4
07:00 PM - 08:00 PM	60.7	86.7	51.1
08:00 PM - 09:00 PM	57.3	77.0	49.6
09:00 PM - 10:00 PM	57.9	81.9	46.9
10:00 PM - 11:00 PM	54.1	79.0	45.2
11:00 PM - 12:00 AM	57.7	83.6	44.1
12:00 AM - 01:00 AM	47.8	65.9	43.1
01:00 AM - 02:00 AM	50.8	78.8	43.1
02:00 AM - 03:00 AM	54.4	85.8	43.1
03:00 AM - 04:00 AM	50.5	76.3	42.8
04:00 AM - 05:00 AM	50.7	76.9	43.3
05:00 AM - 06:00 AM	55.3	80.7	45.1
06:00 AM - 07:00 AM	59.2	81.8	51.2
07:00 AM - 08:00 AM	64.6	83.3	54.8
08:00 AM - 09:00 AM	60.8	79.4	51.6
09:00 AM - 10:00 AM	59.4	82.7	50.8
10:00 AM - 11:00 AM	59.0	82.5	49.5
11:00 AM - 12:00 PM	59.2	89.4	49.6

Leq Average 24 hrs. (dB(A))

58.7

Lmax (dB(A))

89.4

L90 (dB(A))

49.5

Ldn (dB(A))

62.4

Standard (dB(A))

70

115

Reference Method : ISO 1996-1 : 2016

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการ
โรงงาน พ.ศ. 2548

Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak

Chonticha Subongkoch
Scientist (3)

Approved by

Supot S

Supot Salamteh
Section Head

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Analysis / Test Report



Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595458

Date Received : Oct 29, 2025

Date Reported : Nov 06, 2025

Report Nu7 ber: 3441880-1C6

Page 1 of 1

Sample Number 2595458-12
Parameter Noise rbe(24 hrs.q
Location)โรงเรือนบ้านสุรศักดิ์ PS 4 P 0 35491, 1445328q
Measurement Date Oct 24 - Oct 25, 2025
Measurement by Anurak Tongkhajonsakda
Sound Level meter Serial No. 623393

T17 e	Le(rdBrAq	L7 ax rdBrAq	L90 rdBrAq
12:00 PM - 01:00 PM	58.3	81.6	48.5
01:00 PM - 02:00 PM	58.9	82.6	4 .3
02:00 PM - 03:00 PM	5 .5	5 .	48.3
03:00 PM - 04:00 PM	58.5	80.6	50.1
04:00 PM - 05:00 PM	60.6	84.9	51.4
05:00 PM - 06:00 PM	60.3	81 .	52.5
06:00 PM - 0 :00 PM	59.3	9 .	51.9
0 :00 PM - 08:00 PM	60.1	83 .	50.1
08:00 PM - 09:00 PM	59.1	80.8	50.2
09:00 PM - 10:00 PM	5 .	84.3	4 .3
10:00 PM - 11:00 PM	53.5	4 .	45.5
11:00 PM - 12:00 AM	54.9	85.6	44.2
12:00 AM - 01:00 AM	52 .	3 .	44.1
01:00 AM - 02:00 AM	49.1	0.8	44.0
02:00 AM - 03:00 AM	51.1	2 .	43 .
03:00 AM - 04:00 AM	54.1	82.5	43.2
04:00 AM - 05:00 AM	54.3	81.8	43.4
05:00 AM - 06:00 AM	51.9	0 .	44.8
06:00 AM - 0 :00 AM	5 .5	81.2	4 .4
0 :00 AM - 08:00 AM	61 .	82.5	52.3
08:00 AM - 09:00 AM	61.9	86.3	51.2
09:00 AM - 10:00 AM	59.8	82.4	49.2
10:00 AM - 11:00 AM	61.3	90.2	48.2
11:00 AM - 12:00 PM	58.9	82.5	4 .4

Le(Average 24 hrs. rdBrAq

58.4

L7 ax rdBrAq

90.2

L90 rdBrAq

4 .4

Ldn rdBrAq

61.8

Standard rdBrAq

0

115

Reference Method : ISO 1996-1 : 2016

Standard : 1. ปโย . คณเ โน้ " ำวนวกลมแหรช คณพทง5 ทพ. . 2540ดเโระ" หยกน ดเโ้ ยโภทเเงร)กั ทดไป
2. ปโย . " โภทเโระอพอ หเ โนเ เโระ" หยกน คเ โภทเเงรเระ" โนเ หย และโภทเเงรทอช คเ " โนเ โนเ ำ" โ
)เระ ห พ. . 2548

Re7 ark : The laboratory has been accepted as an accredited laboratory co7 plying with the ISO/IEC 1 025.

Technical Management

Chontichak

Chonticha Subongkoch
Scientist riq

Approved by

Supot S

Supot Sala7 teh
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Analysis / Test Report



Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595458

Date Received : Oct 29, 2025

Date Reported : Nov 06, 2025

Report Nu7 ber: 3441881-1C6

Page 1 of 1

Sample Number 2595458-13
Parameter Noise rle(24 hrs.q
Location)โรงโม่หินบดหิน PS 4 P 0 35491, 1445328q
Measurement Date Oct 25 - Oct 26, 2025
Measurement by Anurak Tongkhajonsakda
Sound Level meter Serial No. 623393

T17 e	Le(rdBrAq)	L7 ax rdBrAq	L90 rdBrAq
12:00 PM - 01:00 PM	59.5	82.2	46.8
01:00 PM - 02:00 PM	59.8	84.3	45.9
02:00 PM - 03:00 PM	59.9	84.5	46.5
03:00 PM - 04:00 PM	60.0	84.9	46.9
04:00 PM - 05:00 PM	56.9	80.2	46.9
05:00 PM - 06:00 PM	59.9	80.9	50.6
06:00 PM - 07:00 PM	59.6	81.8	50.0
07:00 PM - 08:00 PM	60.0	83.9	49.0
08:00 PM - 09:00 PM	58.9	89.8	49.0
09:00 PM - 10:00 PM	55.8	82.1	46.3
10:00 PM - 11:00 PM	56.3	84.4	44.4
11:00 PM - 12:00 AM	54.0	83.3	43.4
12:00 AM - 01:00 AM	52.0	80.8	41.4
01:00 AM - 02:00 AM	55.3	80.5	41.3
02:00 AM - 03:00 AM	48.4	0.1	40.9
03:00 AM - 04:00 AM	45.0	6.0	39.6
04:00 AM - 05:00 AM	48.1	1.4	40.0
05:00 AM - 06:00 AM	52.0	9.9	41.0
06:00 AM - 07:00 AM	54.0	13.3	44.0
07:00 AM - 08:00 AM	59.6	83.8	49.1
08:00 AM - 09:00 AM	59.0	82.2	48.4
09:00 AM - 10:00 AM	59.5	84.4	49.1
10:00 AM - 11:00 AM	59.5	80.0	50.1
11:00 AM - 12:00 PM	60.0	84.5	49.0

Le(Average 24 hrs. rdBrAq) 59.8

L7 ax rdBrAq 89.8

L90 rdBrAq 46.5

Ldn rdBrAq 61.1

Standard rdBrAq 115

Reference Method : ISO 1996-1 : 2016

Standard : 1. ป้าย " ดนตรี " ทั่วบริเวณถนนสาย 5 กม. 25400 เมตร (หกปี ดนตรี มโหรี) ที่ หอศิลป์
2. ป้าย " โรงโม่หินบดหิน PS 4 P 0 35491, 1445328q " ทั่วบริเวณและโรงโม่หินบดหิน PS 4 P 0 35491, 1445328q
) โรงโม่หินบดหิน . 2548

Re7 ark : The laboratory has been accepted as an accredited laboratory co7 plying with the ISO/IEC 1 025.

Technical Management

Chontichak

Chonticha Subongkoch
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Analysis / Test Report



Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595458

Date Received : Oct 29, 2025

Date Reported : Nov 06, 2025

Report Nu7 ber: 3441882-1C6

Page 1 of 1

Sample Number 2595458-14
Parameter Noise rle(24 hrs.q
Location)โรงโม่หินบดหิน PS 4 P 0 35491, 1445328q
Measurement Date Oct 26 - Oct 27, 2025
Measurement by Anurak Tongkhajonsakda
Sound Level meter Serial No. 623393

T17 e	Le(rdBrAq)	L7 ax rdBrAq	L90 rdBrAq
12:00 PM - 01:00 PM	59.1	85.8	46.8
01:00 PM - 02:00 PM	60.4	83.0	46.3
02:00 PM - 03:00 PM	59.3	84.0	46.2
03:00 PM - 04:00 PM	59.1	85.0	46.5
04:00 PM - 05:00 PM	59.3	85.4	48.9
05:00 PM - 06:00 PM	59.1	80.8	51.3
06:00 PM - 07:00 PM	58.2	80.0	49.2
07:00 PM - 08:00 PM	59.9	85.0	48.5
08:00 PM - 09:00 PM	58.1	81.1	46.3
09:00 PM - 10:00 PM	55.3	82.2	44.3
10:00 PM - 11:00 PM	55.0	83.2	42.4
11:00 PM - 12:00 AM	49.1	80.3	41.1
12:00 AM - 01:00 AM	54.1	80.0	41.4
01:00 AM - 02:00 AM	49.6	83.3	41.5
02:00 AM - 03:00 AM	44.2	69.6	40.4
03:00 AM - 04:00 AM	46.2	65.0	39.6
04:00 AM - 05:00 AM	46.6	63.0	40.4
05:00 AM - 06:00 AM	53.2	93.3	42.0
06:00 AM - 07:00 AM	56.4	51.1	45.6
07:00 AM - 08:00 AM	61.0	82.9	53.5
08:00 AM - 09:00 AM	59.0	84.3	50.0
09:00 AM - 10:00 AM	58.8	82.1	49.1
10:00 AM - 11:00 AM	60.8	85.4	50.1
11:00 AM - 12:00 PM	51.9	80.0	44.8

Le(Average 24 hrs. rdBrAq) 59.5

L7 ax rdBrAq 85.8

L90 rdBrAq 46.2

Ldn rdBrAq 60.5

Standard rdBrAq 115

Reference Method : ISO 1996-1 : 2016

Standard : 1. ป้าย " ดนตรี " ทั่วบริเวณถนนสาย 5 กม. 25400 เมตร (หกปี ดนตรี มโหรี) ที่ หอศิลป์
2. ป้าย " โรงโม่หินบดหิน PS 4 P 0 35491, 1445328q " ทั่วบริเวณและโรงโม่หินบดหิน PS 4 P 0 35491, 1445328q
) โรงโม่หินบดหิน . 2548

Re7 ark : The laboratory has been accepted as an accredited laboratory co7 plying with the ISO/IEC 1 025.

Technical Management

Chontichak

Chonticha Subongkoch
Scientist riq

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Analysis / Test Report



Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595458

Date Received : Oct 29, 2025

Date Reported : Nov 06, 2025

Report Number: 3441883-1C6

Page 1 of 1

Sample Number	2595458-15
Parameter	Noise (Leq 24 hrs.)
Location	บ้านหนองค้างคาว (GPS 47P 0738701, 1444162)
Measurement Date	Oct 20 - Oct 21, 2025
Measurement by	Anurak Tongkhajonsakda
Sound Level meter	Serial No. 623394

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	53.5	74.9	44.0
12:00 PM - 01:00 PM	46.6	67.5	42.8
01:00 PM - 02:00 PM	53.8	73.5	42.9
02:00 PM - 03:00 PM	54.3	79.2	45.3
03:00 PM - 04:00 PM	57.2	95.8	44.4
04:00 PM - 05:00 PM	56.3	78.5	41.2
05:00 PM - 06:00 PM	47.6	74.2	40.5
06:00 PM - 07:00 PM	49.0	85.8	42.4
07:00 PM - 08:00 PM	48.4	71.5	44.6
08:00 PM - 09:00 PM	51.7	83.6	45.0
09:00 PM - 10:00 PM	62.4	78.3	44.3
10:00 PM - 11:00 PM	56.3	80.8	44.0
11:00 PM - 12:00 AM	44.3	68.2	42.0
12:00 AM - 01:00 AM	45.5	68.2	42.0
01:00 AM - 02:00 AM	43.0	58.8	41.1
02:00 AM - 03:00 AM	45.9	65.2	42.1
03:00 AM - 04:00 AM	44.4	63.9	40.9
04:00 AM - 05:00 AM	53.5	83.2	40.9
05:00 AM - 06:00 AM	46.3	64.7	42.3
06:00 AM - 07:00 AM	53.5	82.7	45.8
07:00 AM - 08:00 AM	54.6	73.5	48.8
08:00 AM - 09:00 AM	54.7	71.2	48.7
09:00 AM - 10:00 AM	58.3	72.3	50.1
10:00 AM - 11:00 AM	50.7	64.0	46.0

Leq Average 24 hrs. (dB(A))	54.2		
Lmax (dB(A))		95.8	
L90 (dB(A))			42.9
Ldn (dB(A))	58.2		
Standard (dB(A))	70	115	

Reference Method : ISO 1996-1 : 2016

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak

Chonticha Subongkoch
Scientist (3)

Approved by

Supot S

Supot Salamteh
Section Head

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Analysis / Test Report



Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595458

Date Received : Oct 29, 2025

Date Reported : Nov 06, 2025

Report Number: 3441884-1C6

Page 1 of 1

Sample Number	2595458-16
Parameter	Noise (Leq 24 hrs.)
Location	บ้านหนองค้างคาว (GPS 47P 0738701, 1444162)
Measurement Date	Oct 21 - Oct 22, 2025
Measurement by	Anurak Tongkhajonsakda
Sound Level meter	Serial No. 623394

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	50.8	76.4	45.7
12:00 PM - 01:00 PM	48.8	71.9	44.6
01:00 PM - 02:00 PM	50.2	72.9	43.8
02:00 PM - 03:00 PM	49.9	67.5	43.7
03:00 PM - 04:00 PM	48.4	71.8	42.1
04:00 PM - 05:00 PM	50.1	70.3	44.2
05:00 PM - 06:00 PM	48.8	66.3	44.9
06:00 PM - 07:00 PM	47.7	67.4	43.9
07:00 PM - 08:00 PM	52.0	79.1	45.6
08:00 PM - 09:00 PM	50.6	65.4	47.3
09:00 PM - 10:00 PM	48.7	76.3	45.3
10:00 PM - 11:00 PM	58.5	82.9	44.6
11:00 PM - 12:00 AM	49.3	80.2	44.1
12:00 AM - 01:00 AM	51.1	81.5	42.7
01:00 AM - 02:00 AM	44.7	59.9	42.3
02:00 AM - 03:00 AM	44.2	62.3	41.6
03:00 AM - 04:00 AM	45.2	64.0	42.0
04:00 AM - 05:00 AM	45.6	57.6	42.7
05:00 AM - 06:00 AM	46.8	65.9	43.6
06:00 AM - 07:00 AM	50.1	78.9	44.8
07:00 AM - 08:00 AM	51.9	66.2	48.1
08:00 AM - 09:00 AM	54.5	77.0	49.6
09:00 AM - 10:00 AM	52.4	69.8	46.2
10:00 AM - 11:00 AM	54.1	75.6	45.8

Leq Average 24 hrs. (dB(A))	51.1		
Lmax (dB(A))		82.9	
L90 (dB(A))			44.2
Ldn (dB(A))	57.6		
Standard (dB(A))	70	115	

Reference Method : ISO 1996-1 : 2016

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak

Chonticha Subongkoch
Scientist (3)

Approved by

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Supot Salamteh
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Analysis / Test Report



Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595458

Date Received : Oct 29, 2025

Date Reported : Nov 06, 2025

Report Number: 3441885-1C6

Page 1 of 1

Sample Number 2595458-1(
Parameter Noise (Le) 24 hrs.
Location บ้านหนองค้างคาว / GPS 4(P 0(38(01, 1444162)
Measurement Date Oct 22 - Oct 23, 2025
Measurement by Anurak Tongkhajonsakda
Sound Level meter Serial No. 623394

Time	Le) dB(A)	Lmax dB(A)	L90 dB(A)
11:00 AM - 12:00 PM	51.3	(0.4	46.0
12:00 PM - 01:00 PM	49.9	68.2	46.1
01:00 PM - 02:00 PM	48.3	63.0	44.2
02:00 PM - 03:00 PM	49.5	6(.3	45.2
03:00 PM - 04:00 PM	50.3	68.4	45.3
04:00 PM - 05:00 PM	50.8	(0.3	44.8
05:00 PM - 06:00 PM	50.3	(0.2	43.4
06:00 PM - 0(:00 PM	52.8	((.3	44.6
0(:00 PM - 08:00 PM	50.5	(9.4	45.6
08:00 PM - 09:00 PM	50.1	81.0	46.6
09:00 PM - 10:00 PM	5(.2	84.8	44.3
10:00 PM - 11:00 PM	50.1	86.4	43.(
11:00 PM - 12:00 AM	46.9	(4.3	43.(
12:00 AM - 01:00 AM	51.9	81.(	43.3
01:00 AM - 02:00 AM	60.4	83.5	43.0
02:00 AM - 03:00 AM	48.2	(6.2	41.9
03:00 AM - 04:00 AM	43.6	66.0	40.(
04:00 AM - 05:00 AM	44.(	5(.9	41.9
05:00 AM - 06:00 AM	55.5	84.3	43.3
06:00 AM - 0(:00 AM	53.9	8(.4	43.9
0(:00 AM - 08:00 AM	52.9	(1.3	46.5
08:00 AM - 09:00 AM	61.(	101.2	4(.6
09:00 AM - 10:00 AM	52.6	((.1	48.0
10:00 AM - 11:00 AM	53.8	90.3	4(.3

Le) Average 24 hrs. dB(A) 53.9
Lmax dB(A) 101.2
L90 dB(A) 44.3

Ldn dB(A) 60.2
Standard dB(A) (0 115

Reference Method : ISO 1996-1 : 2016

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 พ.ศ. 2540 เรื่อง ค่ามาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่อง ค่ามาตรฐานระดับเสียงภายในโรงงาน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 1(025.

Technical Management

Chontichak

Chonticha Subongkoch
Scientist ๓

Approved by

Supot S

Supot Salamteh
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Analysis / Test Report



Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595458

Date Received : Oct 29, 2025

Date Reported : Nov 06, 2025

Report Number: 3441886-1C6

Page 1 of 1

Sample Number 2595458-18
Parameter Noise (Leq 24 hrs.)
Location บ้านหนองค้างคาว (GPS 47P 0738701, 1444162)
Measurement Date Oct 23 - Oct 24, 2025
Measurement by Anurak Tongkhajonsakda
Sound Level meter Serial No. 623394

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	50.0	77.2	46.7
12:00 PM - 01:00 PM	50.1	76.6	44.2
01:00 PM - 02:00 PM	49.2	70.1	43.5
02:00 PM - 03:00 PM	48.4	69.8	44.4
03:00 PM - 04:00 PM	48.6	65.4	43.9
04:00 PM - 05:00 PM	47.6	64.4	43.6
05:00 PM - 06:00 PM	49.2	85.4	44.0
06:00 PM - 07:00 PM	55.0	83.5	43.8
07:00 PM - 08:00 PM	49.8	69.1	46.3
08:00 PM - 09:00 PM	50.4	79.4	46.7
09:00 PM - 10:00 PM	48.5	81.3	45.0
10:00 PM - 11:00 PM	59.2	84.0	45.1
11:00 PM - 12:00 AM	46.6	63.5	43.5
12:00 AM - 01:00 AM	45.5	71.2	43.1
01:00 AM - 02:00 AM	45.8	64.8	43.7
02:00 AM - 03:00 AM	45.5	59.0	43.2
03:00 AM - 04:00 AM	46.6	77.2	43.4
04:00 AM - 05:00 AM	46.3	64.4	43.2
05:00 AM - 06:00 AM	47.6	62.4	43.8
06:00 AM - 07:00 AM	50.2	70.1	45.2
07:00 AM - 08:00 AM	53.3	67.5	49.5
08:00 AM - 09:00 AM	52.8	68.9	48.6
09:00 AM - 10:00 AM	52.4	67.8	46.8
10:00 AM - 11:00 AM	52.9	74.9	47.4

Leq Average 24 hrs. (dB(A)) 51.2
Lmax (dB(A)) 85.4
L90 (dB(A)) 44.0

Ldn (dB(A)) 57.8
Standard (dB(A)) 70 115

Reference Method : ISO 1996-1 : 2016

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่อง กำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่อง กำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak

Chonticha Subongkoch
Scientist (3)

Approved by

Supot S

Supot Salamteh
Section Head

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Analysis / Test Report



Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595458

Date Received : Oct 29, 2025

Date Reported : Nov 06, 2025

Report Nu(ber: 344188m1C6

Page 1 of 1

Sample Number 2595458-19
Parameter Noise (Le) 24 hrs.
Location บ้านหนองค้างคาว 47 GPS 4mP 0m88m01, 1444162m
Measurement Date Oct 24 - Oct 25, 2025
Measurement by Anurak Tongkhajonsakda
Sound Level meter Serial No. 623394

Time	Le (dB(A))	L _{ax} (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	53.0	61.5	45.9
12:00 PM - 01:00 PM	52.0	60.3	44.3
01:00 PM - 02:00 PM	50.1	69.4	43.4
02:00 PM - 03:00 PM	48.2	64.1	42.6
03:00 PM - 04:00 PM	48.5	68.6	42.3
04:00 PM - 05:00 PM	49.6	68.0	43.4
05:00 PM - 06:00 PM	51.1	66.8	45.0
06:00 PM - 07:00 PM	48.5	68.9	45.3
07:00 PM - 08:00 PM	51.1	66.2	44.9
08:00 PM - 09:00 PM	51.0	82.6	44.0
09:00 PM - 10:00 PM	49.0	82.4	46.1
10:00 PM - 11:00 PM	48.0	80.8	45.6
11:00 PM - 12:00 AM	49.0	85.3	44.5
12:00 AM - 01:00 AM	49.0	80.1	43.1
01:00 AM - 02:00 AM	46.1	80.0	42.9
02:00 AM - 03:00 AM	53.1	81.1	42.9
03:00 AM - 04:00 AM	45.0	83.0	42.5
04:00 AM - 05:00 AM	45.0	61.6	42.0
05:00 AM - 06:00 AM	45.0	63.4	42.9
06:00 AM - 07:00 AM	49.6	63.3	43.6
07:00 AM - 08:00 AM	52.1	65.6	44.4
08:00 AM - 09:00 AM	51.0	64.4	46.4
09:00 AM - 10:00 AM	49.0	69.9	45.4
10:00 AM - 11:00 AM	49.0	68.5	41.2

Le) Average 24 hrs. (dB(A)) 51.0
L_{ax} (dB(A)) 80.9
L90 (dB(A)) 43.6
L_{dn} (dB(A)) 58.6
Standard (dB(A)) 70

Reference Method : ISO 1996-1 : 2016

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 พ.ศ. 2540 เรื่อง ค่ามาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่อง ค่ามาตรฐานระดับเสียงภายในโรงงาน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak

Chonticha Subongkoch
Scientist ๓

Approved by

Supot S

Supot Sala(teh
Section Head

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Analysis / Test Report



Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595458

Date Received : Oct 29, 2025

Date Reported : Nov 06, 2025

Report Number: 3441888-1C6

Page 1 of 1

Sample Number 2595458-20
Parameter Noise (Leq 24 hrs.)
Location บ้านหนองค้างคาว (GPS 47P 0738701, 1444162)
Measurement Date Oct 25 - Oct 26, 2025
Measurement by Anurak Tongkhajonsakda
Sound Level meter Serial No. 623394

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	50.8	74.0	43.4
12:00 PM - 01:00 PM	52.0	76.8	42.7
01:00 PM - 02:00 PM	49.7	74.5	42.9
02:00 PM - 03:00 PM	49.3	70.3	40.9
03:00 PM - 04:00 PM	46.6	71.2	39.7
04:00 PM - 05:00 PM	45.9	67.0	41.6
05:00 PM - 06:00 PM	47.9	80.3	40.3
06:00 PM - 07:00 PM	47.9	70.0	42.1
07:00 PM - 08:00 PM	46.1	78.5	40.7
08:00 PM - 09:00 PM	48.8	75.2	43.1
09:00 PM - 10:00 PM	61.8	86.0	45.4
10:00 PM - 11:00 PM	46.4	66.1	41.8
11:00 PM - 12:00 AM	47.3	74.4	43.2
12:00 AM - 01:00 AM	45.4	70.1	42.3
01:00 AM - 02:00 AM	44.2	68.8	41.2
02:00 AM - 03:00 AM	44.0	71.1	40.2
03:00 AM - 04:00 AM	43.1	63.4	40.1
04:00 AM - 05:00 AM	42.9	77.5	39.7
05:00 AM - 06:00 AM	42.8	55.9	40.4
06:00 AM - 07:00 AM	55.4	81.1	43.0
07:00 AM - 08:00 AM	48.7	71.0	42.6
08:00 AM - 09:00 AM	50.1	76.0	44.9
09:00 AM - 10:00 AM	50.9	68.2	46.0
10:00 AM - 11:00 AM	50.1	70.3	45.0

Leq Average 24 hrs. (dB(A)) 51.4
Lmax (dB(A)) 86.0
L90 (dB(A)) 42.1
L_{dn} (dB(A)) 55.5
Standard (dB(A)) 70

Reference Method : ISO 1996-1 : 2016

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่อง กำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่อง กำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak

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Analysis / Test Report



Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2595458

Date Received : Oct 29, 2025

Date Reported : Nov 06, 2025

Report Number: 3441889-1C6

Page 1 of 1

Sample Number	2595458-21
Parameter	Noise (Leq 24 hrs.)
Location	บ้านหนองค้างคาว (GPS 47P 0738701, 1444162)
Measurement Date	Oct 26 - Oct 27, 2025
Measurement by	Anurak Tongkhajonsakda
Sound Level meter	Serial No. 623394

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	48.3	67.2	44.1
12:00 PM - 01:00 PM	48.9	73.1	42.3
01:00 PM - 02:00 PM	47.2	63.4	41.7
02:00 PM - 03:00 PM	47.5	67.7	42.6
03:00 PM - 04:00 PM	46.7	64.8	42.1
04:00 PM - 05:00 PM	47.4	68.5	42.7
05:00 PM - 06:00 PM	47.6	69.6	43.1
06:00 PM - 07:00 PM	46.7	64.0	42.8
07:00 PM - 08:00 PM	50.2	74.6	42.7
08:00 PM - 09:00 PM	59.1	84.8	46.0
09:00 PM - 10:00 PM	48.9	73.0	45.4
10:00 PM - 11:00 PM	62.6	92.2	43.2
11:00 PM - 12:00 AM	45.0	69.6	42.3
12:00 AM - 01:00 AM	44.9	67.8	41.3
01:00 AM - 02:00 AM	51.2	81.2	40.6
02:00 AM - 03:00 AM	43.8	63.7	41.0
03:00 AM - 04:00 AM	44.1	73.2	40.3
04:00 AM - 05:00 AM	43.6	70.8	39.3
05:00 AM - 06:00 AM	51.5	78.9	41.3
06:00 AM - 07:00 AM	46.7	74.3	42.0
07:00 AM - 08:00 AM	48.8	70.0	44.2
08:00 AM - 09:00 AM	49.3	68.7	44.2
09:00 AM - 10:00 AM	49.8	70.2	43.9
10:00 AM - 11:00 AM	50.1	69.6	45.0

Leq Average 24 hrs. (dB(A))

52.3

Lmax (dB(A))

92.2

L90 (dB(A))

42.6

Ldn (dB(A))

60.1

Standard (dB(A))

70

115

Reference Method : ISO 1996-1 : 2016

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป

2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Remark : The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Chontichak

Chonticha Subongkoch
Scientist (3)

Approved by

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Supot Salamteh
Section Head

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ภาคผนวก ค-4

คุณภาพน้ำทิ้งจากระบบการผลิต



Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140
P/O : 4210502315
Project Name : Monitoring EIA
Project Location : GTS4



TESTING
No.0042
Lot ID: 2562154
Date Received : Jul 03, 2025
Date Reported : Jul 11, 2025
Report Number : 3346769-1

Page 1 of 2

Sample Number	2562154-1						
Sampled Date	Jul 03, 2025 10:40 AM						
Sample Description	Wastewater						
Location	บ่อฟักน้ำทิ้งรวม						
Date Analysis Commenced	Jul 03, 2025						
Condition of Sample	Contained in one amber glass bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
Color (at Original pH)	ADMI	-	5	11	≤600	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	8	≤600	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH at 25 degree C		-	-	7.8	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	29.6	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	100	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.

Sampling By : Warunyoo Chimphalee ทะเบียนเลขที่ ว-323-จ-0020

Technical Management

Photchana S

Photchana Seeda
Scientist (4)

ทะเบียนเลขที่ ว-323-จ-0028

Approved by

D. Chamon

Dej Changchon
Senior Manager

ทะเบียนเลขที่ ว-323-จ-0001

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140
P/O : 4210502315
Project Name : Monitoring EIA
Project Location : GTS4



TESTING
No.0042
Lot ID: 2562154
Date Received : Jul 03, 2025
Date Reported : Jul 11, 2025
Report Number : 3346769-1

Page 2 of 2

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.
- Sampling is not included in scope of accreditation ISO/IEC 17025

Technical Management

Photchana S

Photchana Seeda
Scientist (4)

ทะเบียนเลขที่ ว-323-จ-0028

Approved by

D. Chamon

Dej Changchon
Senior Manager

ทะเบียนเลขที่ ว-323-จ-0001

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140
P/O : 4210502315
Project Name : Monitoring EIA
Project Location : GTS4



TESTING
No.0042

Lot ID: 2566515
Date Received : Aug 06, 2025
Date Reported : Aug 14, 2025
Report Number : 3358964-1

Page 1 of 2

Sample Number	2566515-1						
Sampled Date	Aug 06, 2025 10:03 AM						
Sample Description	Wastewater						
Location	บ่อฟักน้ำทิ้งรวม						
Date Analysis Commenced	Aug 06, 2025						
Condition of Sample	Contained in one amber glass bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	3.5	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
Color (at Original pH)	ADMI	-	5	9	≤600	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	8	≤600	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH at 25 degree C		-	-	7.8	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	31.8	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	148	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	8	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.

Sampling By : Wasan Kinunti ทะเบียนเลขที่ ว-323-จ-0019

Technical Management

Jitsupa P.

Jitsupa Pratuangsuk
Scientist (2)
ทะเบียนเลขที่ ว-323-จ-0004

Approved by

D. Chamon

Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-จ-0001

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140
P/O : 4210502315
Project Name : Monitoring EIA
Project Location : GTS4



TESTING
No.0042

Lot ID: 2566515
Date Received : Aug 06, 2025
Date Reported : Aug 14, 2025
Report Number : 3358964-1

Page 2 of 2

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.
- Sampling is not included in scope of accreditation ISO/IEC 17025

Technical Management

Jitsupa P.

Jitsupa Pratuangsuk
Scientist (2)
ทะเบียนเลขที่ ว-323-จ-0004

Approved by

D. Chamon

Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-จ-0001

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140
P/O : 4210502J0c
Project Name : Monitoring EIA
Project Location : GTS4



TESTING
No.0042

Lot ID: 2581435
Date Revei6ed : Sep 05, 2025
Date Reported : Sep 12, 2025
Report - uN ber : 33727709L

Page 1 of 2

Sample Number	25c14359L
Sampled Date	Sep 05, 2025 2:47 PM
Sample Description	Wastewater
Location	บ่อกักน้ำทิ้งรวม
Date Analysis Commenced	Sep 05, 2025
Condition of Sample	Contained in one aN ber glass bottle and tmo plastiv bottles, saN ple vntainers voN ply to pretreatN ent 9 preser6ation standards vAPHA, (SEPAU

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
) BD v6 days at 20 Degree CU	Ng/L	9	2.0	F 2.0	≤500	Standard Methods for the EQn ination of Water and Wastewater. APHA, AWWA x WE&, 24th ed., 2023, part 5210), part 4500 9B G	Rayong
Color vat Briginal pHU	ADMI	9	5	F 5	≤<00	Standard Methods for the EQn ination of Water and Wastewater. APHA, AWWA x WE&, 24th ed., 2023, part 2120 &	Rayong
Color vat pH J.0U	ADMI	9	5	F 5	≤<00	Standard Methods for the EQn ination of Water and Wastewater. APHA, AWWA x WE&, 24th ed., 2023, part 2120 &	Rayong
Bil x Grease	Ng/L	9	3	F 3	≤10	Standard Methods for the EQn ination of Water and Wastewater. APHA, AWWA x WE&, 24th ed., 2023, part 5520)	Rayong
pH at 25 degree C		9	9	J.7	5.597.0	Standard Methods for the EQn ination of Water and Wastewater. APHA, AWWA x WE&, 24th ed., 2023, part 4500 9H vU	Rayong
TeNperature 8	Degree C	9	9	27.<	≤45	Standard Methods for the EQn ination of Water and Wastewater. APHA, AWWA x WE&, 24th ed., 2023, part 2550)	Rayong
Total Dissolved Solids Dried at 1c0 degree C	Ng/L	9	5	<7	≤3000	Standard Methods for the EQn ination of Water and Wastewater. APHA, AWWA x WE&, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried at 1039L05 degree C	Ng/L	9	5	c	≤200	Standard Methods for the EQn ination of Water and Wastewater. APHA, AWWA x WE&, 24th ed., 2023, part 2540 D	Rayong

Guideline : - otification of the Industrial Estate Authority of Thailand - o.027/25<J : General Standards for Wastewater drainage into ventral mastewater treatN ent systeN s in Industrial Estates.

Sampling By : Suramit - arapong ทะเบียนเลขที่ ว98239ก90011

Technical Management

Jitsupa P.

*itsupa Pratuangsuk
Svientist v&U
ทะเบียนเลขที่ ว98239ก90004

Approved by

D. J. J. J.

Dej Changvohn
Senior Manager
ทะเบียนเลขที่ ว98239ก90001

Results apply to the saNplew&as subNitted, unless the saNpling mas vondvoted by ALS. The report shall not be reproduced e&ept in full without the written approval of the laboratory.

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134319d/ EMAIL

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140
P/O : 4210502J0c
Project Name : Monitoring EIA
Project Location : GTS4



TESTING
No.0042

Lot ID: 2581435
Date Revei6ed : Sep 05, 2025
Date Reported : Sep 12, 2025
Report - uN ber : 33727709L

Page 2 of 2

ReN ark :
- LBD : LIN it of Detevion
- "F" : Lomer than LBQ v&IN it of QuantitationU/ LBR v&IN it of ReportingU
- Analytev&UNarked 8 is/are not invluded in svope of Avvreditation ISB/IEC 1J 025.
- SaNpling is not invluded in svope of avvreditation ISB/IEC 1J 025

Technical Management

Jitsupa P.

*itsupa Pratuangsuk
Svientist v&U
ทะเบียนเลขที่ ว98239ก90004

Approved by

D. J. J. J.

Dej Changvohn
Senior Manager
ทะเบียนเลขที่ ว98239ก90001

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140
P/O : 4210502708
Project Name : Monitoring EIA
Project Location : GTS4



TESTING
No.0042
Lot ID: 2591913
Date Received : Oct 03, 2025
Date Reported : Oct 10, 2025
Report Number : 3417900-1

Page 1 of 2

Sample Number	2591913-1						
Sampled Date	Oct 03, 2025 10:35 AM						
Sample Description	Wastewater						
Location	บ่อฟักน้ำทิ้งรวม						
Date Analysis Commenced	Oct 03, 2025						
Condition of Sample	Contained in one amber glass bottle and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
Color (at Original pH)	ADMI	-	5	10	≤600	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	9	≤600	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH at 25 degree C		-	-	8.1	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	30.9	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	192	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	<5	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Guideline : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.

Sampling By : Wasan Kinunti ทะเบียนเลขที่ ว-323-จ-0019

Technical Management

Photchana S

Photchana Seeda
Scientist (4)

ทะเบียนเลขที่ ว-323-จ-0028

Approved by

D. Chamon

Dej Changchon
Senior Manager

ทะเบียนเลขที่ ว-323-จ-0001

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140
P/O : 4210502708
Project Name : Monitoring EIA
Project Location : GTS4



TESTING
No.0042
Lot ID: 2591913
Date Received : Oct 03, 2025
Date Reported : Oct 10, 2025
Report Number : 3417900-1

Page 2 of 2

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.
- Sampling is not included in scope of accreditation ISO/IEC 17025

Technical Management

Photchana S

Photchana Seeda
Scientist (4)

ทะเบียนเลขที่ ว-323-จ-0028

Approved by

D. Chamon

Dej Changchon
Senior Manager

ทะเบียนเลขที่ ว-323-จ-0001

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140
P/O : 4210502J0c
Project Name : Monitoring EIA
Project Location : GTS4



TESTING
No.0042
Lot ID: 25100155
Date Re/ified : v06 03, 2025
Date Reported : v06 10, 2025
Report v umber : 343J9--N

Page 1 of 2

Sample Number	25100155N
Sampled Date	v06 03, 2025 10:24 AM
Sample Description	Wastewater
Location	บ่อกักน้ำทิ้งรวม
Date Analysis Commenced	v06 03, 2025
Condition of Sample	Contained in one amber glass bottle and two plasti7 bottles, sample 7ontainers 7omply to pretreatment Npreservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 Degree C)	mg/L	N	2.0	<2.0	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 NO G	Rayong
Color (at Original pH)	ADMI	N	5	<5	≤- 00	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Color (at pH J.0)	ADMI	N	5	<5	≤- 00	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Oil & Grease	mg/L	N	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Rayong
pH at 25 degree C		N	N	J.c	5.5N0.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 NH (B)	Rayong
Temperature 8	Degree C	N	N	30.1	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 1c0 degree C	mg/L	N	5	40	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried at 103N.05 degree C	mg/L	N	5	<5	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Guideline : votification of the Industrial Estate Authority of Thailand v.o.029/25- J : General Standards for Wastewater drainage into 7entral wastewater treatment systems in Industrial Estates.

Sampling By : Surawit varapong ทะเบียนเลขที่ วN823N0011

Technical Management

Jitsupa P.

*itsupa Pratuangsuk
S7entist (2)
ทะเบียนเลขที่ วN823N0004

Approved by

Dej Chang7hon

Senior Manager
ทะเบียนเลขที่ วN823N0001

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140
P/O : 4210502J0c
Project Name : Monitoring EIA
Project Location : GTS4



TESTING
No.0042
Lot ID: 25100155
Date Re/ified : v06 03, 2025
Date Reported : v06 10, 2025
Report v umber : 343J9--N

Page 2 of 2

Remark :
- LOD : Limit of Dete7tion
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked 8 is/are not in7luded in s7ope of A77reditation ISO/IEC 1J025.
- Sampling is not in7luded in s7ope of a77reditation ISO/IEC 1J025

Technical Management

Jitsupa P.

*itsupa Pratuangsuk
S7entist (2)
ทะเบียนเลขที่ วN823N0004

Approved by

Dej Chang7hon

Senior Manager
ทะเบียนเลขที่ วN823N0001

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140
P/O : 4210502708
Project Name : Monitoring EIA
Project Location : GTS4



TESTING
No.0042
Lot ID: 25106140
Date ReQiced : DeO03, 2025
Date Reported : DeO12, 2025
Report Number : 3453v89-1

Page 1 of 2

Sample Number	2510v140-1						
Sampled Date	DeO03, 2025 10:19 AM						
Sample Description	Wastewater						
Location	บ่อฟักน้ำทิ้งรวม						
Date Analysis Commenced	DeO03, 2025						
Condition of Sample	Contained in one amber glass bottle and two plastiObottles, sample Containers Comply to pretreatment - presercation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Bx D (5 days at 20 Degree C)	mg/L	-	2.0	62.0	≤500	Standard Methods for the E&mination of Water and Wastewater. APHA, AWWA F WE< 24th ed., 2023, part 5210 B, part 4500 - x G	Rayong
Color (at x riginal pH)	ADMI	-	5	v	≤v00	Standard Methods for the E&mination of Water and Wastewater. APHA, AWWA F WE< 24th ed., 2023, part 2120 <	Rayong
Color (at pH 7.0)	ADMI	-	5	5	≤v00	Standard Methods for the E&mination of Water and Wastewater. APHA, AWWA F WE< 24th ed., 2023, part 2120 <	Rayong
x il F Grease	mg/L	-	3	63	≤10	Standard Methods for the E&mination of Water and Wastewater. APHA, AWWA F WE< 24th ed., 2023, part 5520 B	Rayong
pH at 25 degree C		-	-	7.v	5.5-9.0	Standard Methods for the E&mination of Water and Wastewater. APHA, AWWA F WE< 24th ed., 2023, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	31.0	≤45	Standard Methods for the E&mination of Water and Wastewater. APHA, AWWA F WE< 24th ed., 2023, part 2550 B	Rayong
Total Dissolced Solids Dried at 180 degree C	mg/L	-	5	84	≤3000	Standard Methods for the E&mination of Water and Wastewater. APHA, AWWA F WE< 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	65	≤200	Standard Methods for the E&mination of Water and Wastewater. APHA, AWWA F WE< 24th ed., 2023, part 2540 D	Rayong

Guideline : NotifiQation of the Industrial Estate Authority of Thailand No.029/25v7 : General Standards for Wastewater drainage into Central wastewater treatment systems in Industrial Estates.

Sampling By : Wasan Kinunti ทะเบียนเลขที่ ว-323-จ-0019

Technical Management

PhotchanaS

PhotChana Seeda
SOentist (4)
ทะเบียนเลขที่ ว-323-จ-0028

Approved by

Dej ChangChon

Dej ChangChon
Senior Manager
ทะเบียนเลขที่ ว-323-จ-0001

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140
P/O : 4210502708
Project Name : Monitoring EIA
Project Location : GTS4



TESTING
No.0042
Lot ID: 25106140
Date ReQiced : DeO03, 2025
Date Reported : DeO12, 2025
Report Number : 3453v89-1

Page 2 of 2

Remark :
- Lx D : Limit of DeteQion
- "6" : Lower than Lx Q (Limit of Quantitation) / Lx R (Limit of Reporting)
- Analyte(s) marked * is/are not inQuded in sQope of AQQeditation ISx /IEC 17025.
- Sampling is not inQuded in sQope of aQQeditation ISx /IEC 17025

Technical Management

PhotchanaS

PhotChana Seeda
SOentist (4)
ทะเบียนเลขที่ ว-323-จ-0028

Approved by

Dej ChangChon

Dej ChangChon
Senior Manager
ทะเบียนเลขที่ ว-323-จ-0001

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ภาคผนวก ค-5

คุณภาพน้ำที่ระบายจากหอหล่อเย็น



Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140
P/O : 4210502315
Project Name : Monitoring EIA
Project Location : GTS4



TESTING
No.0042
Lot ID: 2562155
Date Received : Jul 03, 2025
Date Reported : Jul 11, 2025
Report Number : 3346770-1

Page 1 of 2

Sample Number	2562155-1
Sampled Date	Jul 03, 2025 10:26 AM
Sample Description	Wastewater
Location	บ่อกักน้ำพลูเด็น
Date Analysis Commenced	Jul 03, 2025
Condition of Sample	Contained in four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Water Testing								
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤20	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
Color (at Original pH)	ADMI	-	5	14	≤300	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	12	≤300	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
pH at 25 degree C		-	-	8.6	5.5-9.0	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	31.2	≤40	≤34	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	856	≤3000	≤1300	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	9	≤50	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Guideline : Guideline (1) : 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).
Guideline (2) : Environmental Impact Assessment Report of Gulf TS4 Co., Ltd.

Sampling By : Warunyoo Chimphalee ทะเบียนเลขที่ ว-323-จ-0020 , Patchanon Inprik ทะเบียนเลขที่ ว-204-จ-0197

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

Photchana S

Photchana Seeda
Scientist (4)

ทะเบียนเลขที่ ว-323-จ-0028

Approved by

D. Chanson

Dej Changchon
Senior Manager

ทะเบียนเลขที่ ว-323-ค-0001

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140
P/O : 4210502315
Project Name : Monitoring EIA
Project Location : GTS4



TESTING
No.0042
Lot ID: 2562155
Date Received : Jul 03, 2025
Date Reported : Jul 11, 2025
Report Number : 3346770-1

Page 2 of 2

- Sampling is not included in scope of accreditation ISO/IEC 17025

Technical Management

Photchana S

Photchana Seeda
Scientist (4)

ทะเบียนเลขที่ ว-323-จ-0028

Approved by

D. Chanson

Dej Changchon
Senior Manager

ทะเบียนเลขที่ ว-323-ค-0001

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140
P/O : 4210502315
Project Name : Monitoring EIA
Project Location : GTS4

Lot ID: 2562155
Date Received : Jul 03, 2025
Date Reported : Jul 12, 2025
Report Number : 3346770-2

Page 1 of 1

Sample Number	2562155-1						
Sampled Date	Jul 03, 2025 10:26 AM						
Sample Description	Wastewater						
Location	บ่อกักน้ำพลูเด็น						
Date Analysis Commenced	Jul 03, 2025						
Condition of Sample	Contained in four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Metals Testing								
Calcium	meq/L	0.003	0.005	3.40	No Standard	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Magnesium	meq/L	0.003	0.005	1.11	No Standard	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
SAR	-	-	-	4.86	No Standard	0-10	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Sodium	meq/L	0.003	0.005	7.30	No Standard	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Water Testing								
Chlorite	mg/L	0.05	0.1	Not Detected	No Standard	≤1.0	In-house method : STM 04-061 based on United States Environmental Protection Agency, 1999, EPA Method 300.1	Bangkok
Dissolved Oxygen	mg/L	-	0.1	7.3	No Standard	≥4	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-O (G)	Rayong

Guideline : Guideline (1) : 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).
Guideline (2) : Environmental Impact Assessment Report of Gulf TS4 Co., Ltd.

Sampling By : Warunyoo Chimphalee , Patchanon Inprik

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

Approved by

Sawitree N.
Sawitree Noisangiam
Manager

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140
P/O : 4210502315
Project Name : Monitoring EIA
Project Location : GTS4



TESTING
No.0042
Lot ID: 2566516
Date Received : Aug 06, 2025
Date Reported : Aug 15, 2025
Report Number : 3358965-1

Page 1 of 2

Sample Number	2566516-1						
Sampled Date	Aug 06, 2025 9:54 AM						
Sample Description	Wastewater						
Location	บ่อกักน้ำพลูเด็น						
Date Analysis Commenced	Aug 06, 2025						
Condition of Sample	Contained in four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Water Testing								
BOD (5 days at 20 Degree C)	mg/L	-	2.0	<2.0	≤20	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Rayong
Color (at Original pH)	ADMI	-	5	8	≤300	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
Color (at pH 7.0)	ADMI	-	5	6	≤300	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Rayong
pH at 25 degree C	-	-	-	8.5	5.5-9.0	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	32.4	≤40	≤34	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	840	≤3000	≤1300	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	9	≤50	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Guideline : Guideline (1) : 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).
Guideline (2) : Environmental Impact Assessment Report of Gulf TS4 Co., Ltd.

Sampling By : Wasan Kinunti ทะเบียนเลขที่ ๖-323-๖-0019 , Patchanon Inprik ทะเบียนเลขที่ ๖-204-๖-0197

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

Photchana S.
Photchana Seeda
Scientist (4)
ทะเบียนเลขที่ ๖-323-๖-0028

Approved by

D. Chongchon
Dej Changchon
Senior Manager
ทะเบียนเลขที่ ๖-323-๖-0001

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140
P/O : 4210502315
Project Name : Monitoring EIA
Project Location : GTS4



TESTING
No.0042
Lot ID: 2566516
Date Received : Aug 06, 2025
Date Reported : Aug 15, 2025
Report Number : 3358965-1

Page 2 of 2

- Sampling is not included in scope of accreditation ISO/IEC 17025

Technical Management

Photchana S

Photchana Seeda
Scientist (4)
ทะเบียนเลขที่ ว-323-จ-0028

Approved by

D. Johnson

Dej Changchon
Senior Manager
ทะเบียนเลขที่ ว-323-ค-0001

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140
P/O : 4210502315
Project Name : Monitoring EIA
Project Location : GTS4

Lot ID: 2566516

Date Received : Aug 06, 2025
Date Reported : Aug 15, 2025
Report Number : 3358965-2

Page 1 of 1

Sample Number 2566516-1
Sampled Date Aug 06, 2025 9:54 AM
Sample Description Wastewater
Location บ่อพักน้ำหล่อเย็น
Date Analysis Commenced Aug 06, 2025
Condition of Sample Contained in four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Metals Testing								
Calcium	meq/L	0.003	0.005	2.57	No Standard	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Magnesium	meq/L	0.003	0.005	0.87	No Standard	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
SAR		-	0.10	6.40	No Standard	0-10	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Sodium	meq/L	0.003	0.005	8.39	No Standard	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Water Testing								
Chlorite	mg/L	0.05	0.1	0.28	No Standard	≤1.0	In-house method : STM 04-061 based on United States Environmental Protection Agency, 1999, EPA Method 300.1	Bangkok
Dissolved Oxygen	mg/L	-	0.1	7.1	No Standard	≥4	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-O (G)	Rayong

Guideline : Guideline (1) : 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).
Guideline (2) : Environmental Impact Assessment Report of Gulf TS4 Co., Ltd.

Sampling By : Wasan Kinunti , Patchanon Inprik

Remark :

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

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

Approved by

Chanatt L.

Chanattagarn Imchom
Section Head

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Analysis / Test Report

Client 2m7lbTJGf oS8QcS

,, 0 . oo d3L MA Western JeaNoarc Hc7strial Wtate v3Tasit3EI7aI 5aenP3RayonP
Tkailanc , vvGu

P/O : G vu0u, guh

Project Name 2. onitorinP WFA

Project Location 2mTJG



TESTING
No.0042

Lot ID: 2581437

5ate Re:eiDec 2Jep u03, u, 0

5ate Reportec 2Jep vd3, u, 0

Report 67- Ner 2dd1, 11d4v

EaPe v ob,

Sample Number	, OhvGdg4v						
Sampled Date	Jep u03, u, 0 , 2 0 E.						
Sample Description	L astewater						
Location	บ่อพักน้ำพลอเนิน						
Date Analysis Commenced	Jep u03, u, 0						
Condition of Sample	f ontainec in b7r plasti: NottlesSJa- ple : ontainers : o- ply to pretreat- ent 4preserDation stancarcS(AEMA / UJVEA)						

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Water Testing								
BOS (0 cays at , u 5ePree f) - P/C		4	, Si	<, Si	≤, u	6o Jtancarc	Jtancarc . etkocs b7r tke Wk- ination obl ater anc L astewaterSAEMA3AL L A & L WF: , Gk ecS, u, d3part 0, vu B3part 00uu 40 m	RayonP
f olor (at OriPinal pM)	A5. H	4	0	g	≤duu	6o Jtancarc	Jtancarc . etkocs b7r tke Wk- ination obl ater anc L astewaterSAEMA3AL L A & L WF: , Gk ecS, u, d3part , v, u F	RayonP
f olor (at pM gSi)	A5. H	4	0	g	≤duu	6o Jtancarc	Jtancarc . etkocs b7r tke Wk- ination obl ater anc L astewaterSAEMA3AL L A & L WF: , Gk ecS, u, d3part , v, u F	RayonP
pM at , 0 cePree f		4	4	hSG	0S4iSi	6o Jtancarc	Jtancarc . etkocs b7r tke Wk- ination obl ater anc L astewaterSAEMA3AL L A & L WF: , Gk ecS, u, d3part 00uu 4M (B)	RayonP
Te- perat7re 9	5ePree f	4	4	dvS	≤Gu	≤dG	Jtancarc . etkocs b7r tke Wk- ination obl ater anc L astewaterSAEMA3AL L A & L WF: , Gk ecS, u, d3part , 00u B	RayonP
Total 5issolDec Jolics 5riec at - P/C vhu cePree f		4	0	88G	≤duuu	≤vduu	Jtancarc . etkocs b7r tke Wk- ination obl ater anc L astewaterSAEMA3AL L A & L WF: , Gk ecS, u, d3part , 0Gu f	RayonP
Total J7spencec Jolics 5riec at vud4u0 cePree f		4	0	vv	≤0u	6o Jtancarc	Jtancarc . etkocs b7r tke Wk- ination obl ater anc L astewaterSAEMA3AL L A & L WF: , Gk ecS, u, d3part , 0Gu 5	RayonP

Guideline : m7iceline (v) 2Wb7ent stancarc b7r ba: tories3inc7strial estate anc inc7strial parI set Ny 6otibi: ation obtk . inistry ob6at7ral Reso7r: e anc WkDron- ent anc etb7ent stancarc b7r ba: tories anc inc7strial parI set Ny 6otibi: ation obTke . inistry obHc7stry catec *7ne ug3BS96 08u (, uvG)S m7iceline (,) 2WbDron- ental H- pa: t Assess- ent Report obm7lbTJGf oS8QcS

Sampling By : J7rawit 6araponP ทะเบียนเลขที่ ๖๔๓, ๔๔4๒๒๖ 3AIIarin B7csaItee ทะเบียนเลขที่ ๖4, ๔๔4๒๒๖

Re- arI 2

- C05 2G- it ob5ete: tion
- "<" 2Gower tkan CDQ (G- it obQ7antitation) / COR (G- it obReportinP)
- Analyte(s) - arIec 9 is/are not in: I7cec in s: ope obA: : recitation H O/HW vgu, 05

Technical Management

Jitsupa P.

*its7pa Erat7anPs7I

J: ientist (,)

ทะเบียนเลขที่ ๖๔๓, ๔๔4๒๒๖

Approved by

D. Jitsupa P.

5ej f kanP: kon

Jenior . anaPer

ทะเบียนเลขที่ ๖๔๓, ๔๔4๒๒๖

Res7ts apply to the sa- ple(s) as s7N- ittec37nless the sa- plinP was : onc7: tec Ny AGSTke report skall not Ne reprocc7: ec ex: ept in 97il witko7t the written approdAl obtkc laNatoryS

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J2Reports_Ali_ mC8pt (v2 dE.)



Analysis / Test Report

Client 2m7lbTJGf oS8QcS

,, 0 . oo d3L MA Western JeaNoarc Hc7strial Wtate v3Tasit3EI7aI 5aenP3RayonP
Tkailanc , vvGu

P/O : G vu0u, guh

Project Name 2. onitorinP WFA

Project Location 2mTJG



TESTING
No.0042

Lot ID: 2581437

5ate Re:eiDec 2Jep u03, u, 0

5ate Reportec 2Jep vd3, u, 0

Report 67- Ner 2dd1, 11d4v

EaPe , ob,

- Ja- plinP is not in: I7cec in s: ope obA: : recitation H O/HW vgu, 0

Sample Number	, OhvGdg4v						
Sampled Date	Jep u03, u, 0 , 2 0 E.						
Sample Description	L astewater						
Location	บ่อพักน้ำพลอเนิน						
Date Analysis Commenced	Jep u03, u, 0						
Condition of Sample	f ontainec in b7r plasti: NottlesSJa- ple : ontainers : o- ply to pretreat- ent 4preserDation stancarcS(AEMA / UJVEA)						

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Water Testing								
BOS (0 cays at , u 5ePree f) - P/C		4	, Si	<, Si	≤, u	6o Jtancarc	Jtancarc . etkocs b7r tke Wk- ination obl ater anc L astewaterSAEMA3AL L A & L WF: , Gk ecS, u, d3part 0, vu B3part 00uu 40 m	RayonP
f olor (at OriPinal pM)	A5. H	4	0	g	≤duu	6o Jtancarc	Jtancarc . etkocs b7r tke Wk- ination obl ater anc L astewaterSAEMA3AL L A & L WF: , Gk ecS, u, d3part , v, u F	RayonP
f olor (at pM gSi)	A5. H	4	0	g	≤duu	6o Jtancarc	Jtancarc . etkocs b7r tke Wk- ination obl ater anc L astewaterSAEMA3AL L A & L WF: , Gk ecS, u, d3part , v, u F	RayonP
pM at , 0 cePree f		4	4	hSG	0S4iSi	6o Jtancarc	Jtancarc . etkocs b7r tke Wk- ination obl ater anc L astewaterSAEMA3AL L A & L WF: , Gk ecS, u, d3part 00uu 4M (B)	RayonP
Te- perat7re 9	5ePree f	4	4	dvS	≤Gu	≤dG	Jtancarc . etkocs b7r tke Wk- ination obl ater anc L astewaterSAEMA3AL L A & L WF: , Gk ecS, u, d3part , 00u B	RayonP
Total 5issolDec Jolics 5riec at - P/C vhu cePree f		4	0	88G	≤duuu	≤vduu	Jtancarc . etkocs b7r tke Wk- ination obl ater anc L astewaterSAEMA3AL L A & L WF: , Gk ecS, u, d3part , 0Gu f	RayonP
Total J7spencec Jolics 5riec at vud4u0 cePree f		4	0	vv	≤0u	6o Jtancarc	Jtancarc . etkocs b7r tke Wk- ination obl ater anc L astewaterSAEMA3AL L A & L WF: , Gk ecS, u, d3part , 0Gu 5	RayonP

Guideline : m7iceline (v) 2Wb7ent stancarc b7r ba: tories3inc7strial estate anc inc7strial parI set Ny 6otibi: ation obtk . inistry ob6at7ral Reso7r: e anc WkDron- ent anc etb7ent stancarc b7r ba: tories anc inc7strial parI set Ny 6otibi: ation obTke . inistry obHc7stry catec *7ne ug3BS96 08u (, uvG)S m7iceline (,) 2WbDron- ental H- pa: t Assess- ent Report obm7lbTJGf oS8QcS

Sampling By : J7rawit 6araponP ทะเบียนเลขที่ ๖๔๓, ๔๔4๒๒๖ 3AIIarin B7csaItee ทะเบียนเลขที่ ๖4, ๔๔4๒๒๖

Re- arI 2

- C05 2G- it ob5ete: tion
- "<" 2Gower tkan CDQ (G- it obQ7antitation) / COR (G- it obReportinP)
- Analyte(s) - arIec 9 is/are not in: I7cec in s: ope obA: : recitation H O/HW vgu, 05

Technical Management

Jitsupa P.

*its7pa Erat7anPs7I

J: ientist (,)

ทะเบียนเลขที่ ๖๔๓, ๔๔4๒๒๖

Approved by

D. Jitsupa P.

5ej f kanP: kon

Jenior . anaPer

ทะเบียนเลขที่ ๖๔๓, ๔๔4๒๒๖

Res7ts apply to the sa- ple(s) as s7N- ittec37nless the sa- plinP was : onc7: tec Ny AGSTke report skall not Ne reprocc7: ec ex: ept in 97il witko7t the written approdAl obtkc laNatoryS

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J2Reports_Ali_ mC8pt (v2 dE.)



Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140
P/O : 4210502708
Project Name : Monitoring EIA
Project Location : GTS4

Lot ID: 2581437
Date Received : Sep 05, 2025
Date Reported : Sep 13, 2025
Report Number : 3392993-2

Page 1 of 1

Sample Number	2581437-1						
Sampled Date	Sep 05, 2025 2:25 PM						
Sample Description	Wastewater						
Location	บ่อกักน้ำพลัดเนิน						
Date Analysis Commenced	Sep 05, 2025						
Condition of Sample	Contained in four plastic bottles. Sample containers comply to pretreatment - preservation standards. (APHA / USEPA)						

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Metals Testing								
Calcium	meq/L	0.003	0.005	2.06	No Standard	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Magnesium	meq/L	0.003	0.005	0.61	No Standard	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
SAR	-	-	0.10	6.17	No Standard	0-10	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Sodium	meq/L	0.003	0.005	7.13	No Standard	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Water Testing								
Chlorite	mg/L	0.05	0.1	0.12	No Standard	≤1.0	In-house method : STM 04-061 based on United States Environmental Protection Agency, 1999, EPA Method 300.1	Bangkok
Dissolved Oxygen	mg/L	-	0.1	6.0	No Standard	≥4	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-O (G)	Rayong

Guideline : Guideline (1) : 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).
Guideline (2) : Environmental Impact Assessment Report of Gulf TS4 Co., Ltd.

Sampling By : Surawit Narapong , Akkarin Budsaktee

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

Approved by

Jitsupa P.

Jitsupa Pratuangskul
Scientist (2)

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Analysis / Test Report

Client : GNF TS1 4oC . tvC
225 L oo 6, MWA Eastern Seaboarv EnvNstrial Hstate d, Tasit, IInaP Daenk, Rayong
Thailanv Zdd10
P/O : 12d050230w
Project Name : L onitorink HEA
Project Location : GTS1



TESTING
No.0042
Lot ID: 2591915
Date Receiv : ugt 06, 2025
Date Reportev : ugt dd, 2025
Report - Nmber : 61d38069d

Take d of 2

Sample Number	258d8d59d						
Sampled Date	ugt 06, 2025 d0:25 AL						
Sample Description	Maste(ater						
Location	บ่อกักน้ำพลัดเนิน						
Date Analysis Commenced	ugt 06, 2025						
Condition of Sample	4ontaineiv in foNr plastig bottles, sample gontainers gomply to pretreatment 9presercation stanvarvs LAI WA,) SHI AB						

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Water Testing								
Qu D L5 vays at 20 Dekree 4B	mk/.	9	20	v5	≤20	- o Stanvarv	Stanvarv L ethovs for the Hkamination of Mater anv Maste(aterCAI WA, AMMA & MHF, 21th evC 2026, part 52d0 Q, part 1500 9u G	Rayonk
4olor lbt urikinal pVB	ADL E	9	5	d6	≤600	- o Stanvarv	Stanvarv L ethovs for the Hkamination of Mater anv Maste(aterCAI WA, AMMA & MHF, 21th evC 2026, part 2d20 F	Rayonk
4olor lbt pW30B	ADL E	9	5	dd	≤600	- o Stanvarv	Stanvarv L ethovs for the Hkamination of Mater anv Maste(aterCAI WA, AMMA & MHF, 21th evC 2026, part 2d20 F	Rayonk
pWat 25 vekree 4		9	9	v6	5C980	- o Stanvarv	Stanvarv L ethovs for the Hkamination of Mater anv Maste(aterCAI WA, AMMA & MHF, 21th evC 2026, part 2d20 F	Rayonk
TemperatNre <	Dekree 4	9	9	62C	≤10	≤61	Stanvarv L ethovs for the Hkamination of Mater anv Maste(aterCAI WA, AMMA & MHF, 21th evC 2026, part 1500 9WUDB	Rayonk
Total Dissolvev Solivs Driev at mk/. dWd vekree 4		9	5	3w1	≤6000	≤d600	Stanvarv L ethovs for the Hkamination of Mater anv Maste(aterCAI WA, AMMA & MHF, 21th evC 2026, part 2510 4	Rayonk
Total SNspenvev Solivs Driev at d069d05 vekree 4	mk/. at d069d05 vekree 4	9	5	d6	≤50	- o Stanvarv	Stanvarv L ethovs for the Hkamination of Mater anv Maste(aterCAI WA, AMMA & MHF, 21th evC 2026, part 2510 D	Rayonk

Guideline : GNvline UDB : HfflNent stanvarv for factories, invNstrial estate anv invNstrial parP set by - otification of the L inistry of - atNral ResoNge anv Hncironment anv efflNent stanvarv for factories anv invNstrial parP set by - otification of The L inistry of EnvNstry vatev 7Nhe 03, 00H25*0 U20d3BC
GNvline UDB : Hncironmental Emapgt Assessment Report of GNF TS1 4oC . tvC

Sampling By : Masan JinNnti vcevNenlexta 952699d0d8 , APParin ONvsaPtee vcevNenlexta 9520199d0d8*

RemarP :
- . uD : . limit of Detegion
- Q Q : . o(er than . uK U limit of KNantitationB/ . uR U limit of ReportinkB
- AnalytelBmarPev <is/are not inglNvev in scope of Aggrevitation tSu/BH d3025C

Technical Management

PhotchanaS

I hotghana Seeva
Sgientist UDB
vcevNenlexta 952699d02w

Approved by

D. Khunon

Dej 4hankhohn
Senior L anaker
vcevNenlexta 952699d00d

ResNts apply to the sample(s) as submitted, unless the sampling (as govNteev by A. 5CThe report shall not be reprovNgev except in fNli (thotNt the ritten approval of the laboratoryC

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Analysis / Test Report

Client : GNF TS1 4oÇ : tvC

225 L oo 6, MVA Hastern Seaboarv EnvNstrial Hstate d, Tasit, IINaP Daenk, Rayonk
Thailanv Zdd10

P/O : 12d050230w

Project Name : L onitorink HEA

Project Location : GTS1



TESTING
No.0042

Lot ID: 2591915

Date Regeicev : ugt 06, 2025

Date Reportev : ugt dd, 2025

Report - Nmber : 61d38069d

Page 2 of 2

- Samplink is not ingInvev in sgope of aggravitation ISu/B44 d3025



Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140

P/O : 4210502708

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2591915

Date Received : Oct 03, 2025

Date Reported : Oct 11, 2025

Report Number : 3417903-2

Page 1 of 1

Sample Number 2591915-1
Sampled Date Oct 03, 2025 10:25 AM
Sample Description Wastewater
Location บ่อพักน้ำหล่อเย็น
Date Analysis Commenced Oct 03, 2025
Condition of Sample Contained in four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Metals Testing								
Calcium	meq/L	0.003	0.005	3.41	No Standard	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Magnesium	meq/L	0.003	0.005	1.01	No Standard	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
SAR		-	0.10	5.47	No Standard	0-10	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Sodium	meq/L	0.003	0.005	8.13	No Standard	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Water Testing								
Chlorite	mg/L	0.05	0.1	Not Detected	No Standard	≤1.0	In-house method : STM 04-061 based on United States Environmental Protection Agency, 1999, EPA Method 300.1	Bangkok
Dissolved Oxygen	mg/L	-	0.1	7.8	No Standard	≥4	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-O (G)	Rayong

Guideline : Guideline (1) : 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).
Guideline (2) : Environmental Impact Assessment Report of Gulf TS4 Co., Ltd.

Sampling By : Wasan Kinunti , Akkarin Budsaktee

Remark :

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

Technical Management

Photchana S

I hotghana Seeva

Sgientist U.B

ทะเบียนเลขที่ ๑๕26๑๙๑02๖

Approved by

D. J. J. J.

Dej 4hankghon

Senior L anaker

ทะเบียนเลขที่ ๑๕26๑๙๑00๐d

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

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Approved by

Photchana S

Photchana Seeda

Scientist (4)

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Analysis / Test Report

Client : b-IGTF 1 So4 Qv4
225 . oo 6, L MA Western f eamrvar Hhv- strial Wtate d, Tasit, El- aI DaenP, RayonP
Tkailanv Zdd10
P/O : 12d050230h
Project Name : onitorinP WFA
Project Location : b Tf 1



TESTING
No.0042
Lot ID: 25100156
Date Receigev : uog 06, 2025
Date Reportev : uog dd, 2025
Report u- N mer : 61638309d

EaPe d oG2

Sample Number	25d00d5v8d
Sampled Date	uog 06, 2025 d0:dwA.
Sample Description	L aste(ater
Location	บ่อพักน้ำพลูเด็น
Date Analysis Commenced	uog 06, 2025
Condition of Sample	Sontainev in Q- r plastic mottles4f aNple containers coN ply to pretreatN ent 9presergation stanvarvs4(AEMA /) f VEAAB

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Water Testing								
Ox D L5 vays at 20 DePree SB N P/C	N P/C	9	240	7 240	≤20	uo f tanvarv	f tanvarv . etkovs Qr tke V&Nination oGL ater anv L aste(ater4AEMA, AL L A F L Wk, 21tk ev4 2026, part 52d0 O, part 1500 9x b	RayonP
Solor U&t x riPinal pMB	AD. H	9	5	d0	≤600	uo f tanvarv	f tanvarv . etkovs Qr tke V&Nination oGL ater anv L aste(ater4AEMA, AL L A F L Wk, 21tk ev4 2026, part 2d20 <	RayonP
Solor U&t pM 340B	AD. H	9	5	d0	≤600	uo f tanvarv	f tanvarv . etkovs Qr tke V&Nination oGL ater anv L aste(ater4AEMA, AL L A F L Wk, 21tk ev4 2026, part 2d20 <	RayonP
pM at 25 vePree S		9	9	h4	549940	uo f tanvarv	f tanvarv . etkovs Qr tke V&Nination oGL ater anv L aste(ater4AEMA, AL L A F L Wk, 21tk ev4 2026, part 1500 9M UOB	RayonP
TeNperat- re *	DePree S	9	9	604B	≤10	≤61	f tanvarv . etkovs Qr tke V&Nination oGL ater anv L aste(ater4AEMA, AL L A F L Wk, 21tk ev4 2026, part 2550 O	RayonP
Total Dissolgev f olivs Driev at N P/C dh0 vePree S	N P/C	9	5	8dw	≤6000	≤d600	f tanvarv . etkovs Qr tke V&Nination oGL ater anv L aste(ater4AEMA, AL L A F L Wk, 21tk ev4 2026, part 2510 S	RayonP
Total f -spenvev f olivs Driev at d069d05 vePree S	N P/C	9	5	75	≤50	uo f tanvarv	f tanvarv . etkovs Qr tke V&Nination oGL ater anv L aste(ater4AEMA, AL L A F L Wk, 21tk ev4 2026, part 2510 D	RayonP

Guideline : b- iveline L&B: V&N ent stanvarv Qr Actories, inv- strial estate anv inv- strial parI set my uotification oGtke . inistry oGuat- ral Reso- rce anv V&NironN ent anv eG- ent stanvarv Qr Actories anv inv- strial parI set my uotification oGtke . inistry oGHV- stry vatev J- ne 03, 04M25w0 L20d3B4
b- iveline L&B: V&NironN ental HN pact AssessN ent Report oGb- IGTF 1 So4 Qv4

Sampling By : f - ra(it uaraponP ทะเบียนเลขที่ 952699900dd , Karvra nvit Kitis- paganit ทะเบียนเลขที่ 95201999000d

ReNari :
- Ox D : QIN it oGDetection
- "7" : Co(er tkan Ox Q L&N it oGQ- antitationB/ Ox R L&N it oGReportinPB
- Analyte&BNari ev * is/are not incl- vev in scope oGAccrevitation H x/HW6 d30254

Technical Management

Jitsupa P.

Jits- pa Erat- anPs- I
f cientist L&B
ทะเบียนเลขที่ 95269990001

Approved by

D. Jitsupa

Dej SkanPckon
f enior . anaPer
ทะเบียนเลขที่ 9526999000d

Res- lts apply to the saNple&Bas s- nN ittev, - nless the saNplnP (as conv- ctev my A&F 4Tke report shall not me repro- vev e&cept in G II (itko- t tke (ritten appral oGtke lamratory4

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Analysis / Test Report

Client : b-IGTF 1 So4 Qv4
225 . oo 6, L MA Western f eamrvar Hhv- strial Wtate d, Tasit, El- aI DaenP, RayonP
Tkailanv Zdd10
P/O : 12d050230h
Project Name : onitorinP WFA
Project Location : b Tf 1



TESTING
No.0042
Lot ID: 25100156
Date Receigev : uog 06, 2025
Date Reportev : uog dd, 2025
Report u- N mer : 61638309d

EaPe 2 oG2

- f aNplnP is not incl- vev in scope oGAccrevitation H x/HW6 d3025

Technical Management

Jitsupa P.

Jits- pa Erat- anPs- I
f cientist L&B
ทะเบียนเลขที่ 95269990001

Approved by

D. Jitsupa

Dej SkanPckon
f enior . anaPer
ทะเบียนเลขที่ 9526999000d

Res- lts apply to the saNple&Bas s- nN ittev, - nless the saNplnP (as conv- ctev my A&F 4Tke report shall not me repro- vev e&cept in G II (itko- t tke (ritten appral oGtke lamratory4

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Analysis / Test Report

Client : b-IGTF 1 So4 Qv4
225 . oo 6, L MA Western f eambarv Hiv- strial Vstate d, Tasit, El- aI DaenP, RayonP
Tkailanv 2dd10
P/O : 12d050230h
Project Name : . onitorinP WFA
Project Location : b Tf 1

Lot ID: 25100156
Date Receiv : uog 06, 2025
Date Reportev : uog dd, 2025
Report u- N nner : 616383092

EaPe d oGD

Sample Number	25d00d5v8d
Sampled Date	uog 06, 2025 d0:dwA.
Sample Description	L asteuater
Location	' ธิ ธิ "พจก ธิมิ"
Date Analysis Commenced	uog 06, 2025
Condition of Sample	Staintainev in Q- r plastig nttles4f aNple containers coNply to pretreatNent 9presergation stanvarvs4UAEMA /) f VEA7

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Metals Testing								
Salci- N	N eq/C	0406	0405	6408	uo f tanvarv	uo f tanvarv	H9ko- se Netkov : f.T. 0590d1 nasev on) nitev f tates VhgironN ental Erotection APency, d881, VEA . etkov 2004B	BanPIoI
. aPnesi- N	N eq/C	0406	0405	d402	uo f tanvarv	uo f tanvarv	H9ko- se Netkov : f.T. 0590d1 nasev on) nitev f tates VhgironN ental Erotection APency, d881, VEA . etkov 2004B	BanPIoI
f AR		9	0410	541h	uo f tanvarv	0910	H9ko- se Netkov : f.T. 0590d1 nasev on) nitev f tates VhgironN ental Erotection APency, d881, VEA . etkov 2004B	BanPIoI
f ovi- N	N eq/C	0406	0405	34hw	uo f tanvarv	uo f tanvarv	H9ko- se Netkov : f.T. 0590d1 nasev on) nitev f tates VhgironN ental Erotection APency, d881, VEA . etkov 2004B	BanPIoI
Water Testing								
Sklorite	N P/C	0405	041	uot Detectev	uo f tanvarv	≤d40	H9ko- se Netkov : f.T. 0190wd nasev on) nitev f tates VhgironN ental Erotection APency, d888, VEA . etkov 6004d	BanPIoI
Dissolgev OxyPen	N P/C	9	041	346	uo f tanvarv	≥1	f tanvarv . etkocv Qr tke W&N ination oGL ater anv L asteuater4AEMA, AL L A & L VF, 21tk ev4 2026, part 150090 lb7	RayonP

Guideline : b- iveline U17 : V&G- ent stanvarv Qr Gatories, inv- strial estate anv inv- strial parI set ny uotiGcation oGtke . inistry oGhV- stry vatev J- ne 03, B4M25v0 U20d374
b- iveline U27 : VhgironN ental HN pact AssessN ent. Report oGb- IGTF 1 So4 Qv4

Sampling By : f - rausit uaraponP , Karvm nvit Kitis- paganit

ReNari I :
- COD : QN it oGDetection
- "<" : Cower tkan COD UQIN it oGQ- antitation7 / COD UQIN it oGReportinP7

Res- Its apply to the saNple48 as s- nN ittec, - nless the saNplnP u as conv- ctew ny AQ4Tke report skail not ne repro- cev except in G II itko- t the written appoal oGtke laboratory4

Approved by

Savitree N.
f au itree uoisanPiAN
. anaPer

ADDRESS 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250 Thailand | PHONE +66 0 2760 3000 | FAX +66 0 2760 3197
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Analysis / Test Report

Client : b- IGTF d So4 Qtc4
225 . oo 6, L MA Western f eambarc Hic- strial Vstate v, Tasit, El- aI uaeNP, RayonP
Tkailanc 2vvd0
P/O : d2v0502h0w
Project Name : . onitorinP WFA
Project Location : b Tf d



TESTING
No.0042
Lot ID: 25106142
uate RegelDec : ueg 06, 2025
uate Reportec : ueg v6, 2025
Report 9- N nner : 6d5613v8v

EaPe v oGD

Sample Number	25v01vd28v
Sampled Date	ueg 06, 2025 v0:v0 A.
Sample Description	L aste(ater
Location	บอพักน้ำพลอเดิน
Date Analysis Commenced	ueg 06, 2025
Condition of Sample	Staintainec in Q- r plastig nttles, saNple containers goNply to pretreatNent 8preserDation stancarcv UAEMA,) f VEA6

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Water Testing								
Ox u L5 cays at 20 uePree SB	N P/C	8	240	d41	≤20	9o f tancarc	f tancarc . etkocv Qr tke W&N ination oGL ater anc L aste(ater4AEMA, AL L A F L Wk, 2dtk ec4 2026, part 52v0 O, part d500 8x b	RayonP
Solor lbt x riPinal pMB	Au. H	8	5	v1	≤600	9o f tancarc	f tancarc . etkocv Qr tke W&N ination oGL ater anc L aste(ater4AEMA, AL L A F L Wk, 2dtk ec4 2026, part 2v20 <	RayonP
Solor lbt pM h40B	Au. H	8	5	v1	≤600	9o f tancarc	f tancarc . etkocv Qr tke W&N ination oGL ater anc L aste(ater4AEMA, AL L A F L Wk, 2dtk ec4 2026, part 2v20 <	RayonP
pM at 25 cePree S		8	8	w41	548340	9o f tancarc	f tancarc . etkocv Qr tke W&N ination oGL ater anc L aste(ater4AEMA, AL L A F L Wk, 2dtk ec4 2026, part 2v20 S	RayonP
TeN perat- re 7	uePree S	8	8	6041	≤d0	≤6d	f tancarc . etkocv Qr tke W&N ination oGL ater anc L aste(ater4AEMA, AL L A F L Wk, 2dtk ec4 2026, part d500 8M UDB	RayonP
Total uissolDec f olics uriec at N P/C vvd0 cePree S		8	5	30w	≤6000	≤v600	f tancarc . etkocv Qr tke W&N ination oGL ater anc L aste(ater4AEMA, AL L A F L Wk, 2dtk ec4 2026, part 2v20 S	RayonP
Total f- spencec f olics uriec at v068v05 cePree S	N P/C	8	5	v2	≤50	9o f tancarc	f tancarc . etkocv Qr tke W&N ination oGL ater anc L aste(ater4AEMA, AL L A F L Wk, 2dtk ec4 2026, part 2v20 u	RayonP

Guideline : b- iceline U1B : V&G- ent stancarc Qr Gatories, inc- strial estate anc inc- strial parI set ny 9otiGcation oGtke . inistry oG9at- ral Reso- rge anc VhgironN ent anc etG- ent stancarc Qr Gatories anc inc- strial parI set ny 9otiGcation oGtke . inistry oGhHC- stry catec *- ne 0h, O4M2510 U20vhB4
b- iceline U2B : VhgironN ental HN pagt AssessN ent. Report oGb- IGTF d So4 Qtc4

Sampling By : L asan Jin- nti ธิะเมธิณเลขที่ 88268800v3 , f aNart Jk- Npklee ธิะเมธิณเลขที่ 8820d8800vd

ReNari I :
- Ox u : QN it oGuetegtion
- Q Q : Co(er tkan Ox K UQIN it oGK- antitationB / Ox R UQIN it oGReportinPB
- Analytel8NarIec 7 is/are not ingl- cec in scope oGAggreccitation H x /H6 vH0254

Technical Management

Photchana S
Ekotkana f eeca
f gientist U1B
ธิะเมธิณเลขที่ 882688002w

Approved by

D. Khun
uej SkanPgkon
f enior . anaPer
ธิะเมธิณเลขที่ 882688000v

Res- Its apply to the saNple48 as s- nN ittec, - nless the saNplnP (as gmc- gtec ny AQ4Tke report skail not ne repro- gec e8gpt in G II (itko- t the ritten appoal oGtke laboratory4

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Analysis / Test Report

Client : b-IGTf d So4 Qc4
225 . oo 6, L MA Western f eamarc Hic- strial Vstate v, Tasit, El- aI uae nP, RayonP
Tkailanc 2vvd0
P/O : d2v0502h0w
Project Name : onitorinP WFA
Project Location : b Tf d



TESTING
No.0042
Lot ID: 25106142
uate RegeiDec : ueg 06, 2025
uate Reportec : ueg v6, 2025
Report 9- N ner : 6d5613v8v

EaPe 2 oGZ

- faNplinP is not ingl- cec in sgope oGaggreccitation H x /HW6 vh025



Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong
Thailand 21140
P/O : 4210502708
Project Name : Monitoring EIA
Project Location : GTS4

Lot ID: 25106142
Date Received : Dec 03, 2025
Date Reported : Dec 13, 2025
Report Number : 3453691-2

Page 1 of 1

Sample Number 25106142-1
Sampled Date Dec 03, 2025 10:10 AM
Sample Description Wastewater
Location ปรุพังน้ำหล่อเย็น
Date Analysis Commenced Dec 03, 2025
Condition of Sample Contained in four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Metals Testing								
Calcium	meq/L	0.003	0.005	3.54	No Standard	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Magnesium	meq/L	0.003	0.005	1.16	No Standard	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
SAR		-	0.10	4.81	No Standard	0-10	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Sodium	meq/L	0.003	0.005	7.37	No Standard	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Water Testing								
Chlorite	mg/L	0.05	0.1	0.18	No Standard	≤1.0	In-house method : STM 04-061 based on United States Environmental Protection Agency, 1999, EPA Method 300.1	Bangkok
Dissolved Oxygen	mg/L	-	0.1	7.5	No Standard	≥4	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-O (G)	Rayong

Guideline : Guideline (1) : 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).
Guideline (2) : Environmental Impact Assessment Report of Gulf TS4 Co., Ltd.

Sampling By : Wasan Kinunti , Samart Khumphlee

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

Technical Management

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ทะเบียนเลขที่ ๖8526๙8002w

Approved by

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ทะเบียนเลขที่ ๖8526๙8000v

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Nanthawadee Somboon
Specialist 2

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ภาคผนวก ค-6

คุณภาพน้ำผิวดิน



Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

87 M.Thai Tower All Season Place, 11th Floor, Wireless Road, Lumpini, Pathumwan,
Bangkok Thailand 10330

P/O : GTS4-4210500514

Project Name : Monitoring EIA

Project Location: GTS4



TESTING
No.0042

Lot ID: 2591905

Date Received : Oct 22, 2025

Date Reported : Nov 04, 2025

Report Number : 3417892-1 C6

Page 1 of 12

Sample Number	2591905-1					
Sampled Date	Oct 22, 2025 9:15 AM					
Sample Description	Surface water					
Location	คลองกร่างเหนือเขตพื้นที่นิคมฯ 200 เมตร					
Date Analysis Commenced	Oct 22, 2025					
Condition of Sample	Contained in two BOD bottles and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)					

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Calcium *	meq/L	0.003	0.005	1.65	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Magnesium *	meq/L	0.003	0.005	0.36	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
SAR *	meq/L	-	-	0.94	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Sodium *	meq/L	0.003	0.005	0.95	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Water Testing							
BOD *	mg/L	-	2	<2.0	≤4	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O C	Rayong
Chlorite *	mg/L	0.05	0.1	Not Detected	No Standard	In-house method : STM 04-061 based on United States Environmental Protection Agency, 1999, EPA Method 300.1	Bangkok
Chlorite *	ug/L	50	100	Not Detected	No Standard	In-house method : STM 04-061 based on United States Environmental Protection Agency, 1999, EPA Method 300.1	Bangkok
Dissolved Oxygen *	mg/L	-	0.1	5.8	≥2	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-O (C)	Rayong
pH at 25 degree C	-	-	-	6.9	5.0-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

87 M.Thai Tower All Season Place, 11th Floor, Wireless Road, Lumpini, Pathumwan,
Bangkok Thailand 10330

P/O : GTS4-4210500514

Project Name : Monitoring EIA

Project Location: GTS4



TESTING
No.0042

Lot ID: 2591905

Date Received : Oct 22, 2025

Date Reported : Nov 04, 2025

Report Number : 3417892-1 C6

Page 2 of 12

Sample Number	2591905-1					
Sampled Date	Oct 22, 2025 9:15 AM					
Sample Description	Surface water					
Location	คลองกร่างเหนือเขตพื้นที่นิคมฯ 200 เมตร					
Date Analysis Commenced	Oct 22, 2025					
Condition of Sample	Contained in two BOD bottles and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)					

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Temperature *	Degree C	-	-	28.6	n'	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	224	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C *	mg/L	-	5	16	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)

n': Change from Natural condition not more than 3 degree C

Sampled By : Warunyoo Chimphaee , Patchanon Inprik

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.
- [A] Analysis conducted by ALS Laboratory Group (Thailand) Co.,Ltd. Bangkok Branch, DSS Accreditation No. 0009.
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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

87 M.Thai Tower All Season Place, 11th Floor, Wireless Road, Lumpini, Pathumwan,
Bangkok Thailand 10330

P/O : GTS4-4210500514

Project Name : Monitoring EIA

Project Location: GTS4



TESTING
No.0042

Lot ID: 2591905

Date Received : Oct 22, 2025

Date Reported : Nov 04, 2025

Report Number : 3417892-1 C6

Page 3 of 12

Sample Number	2591905-2					
Sampled Date	Oct 22, 2025 9:37 AM					
Sample Description	Surafce water					
Location	คลองระเวียงเหนือเขตพื้นที่นิคมฯ 200 เมตร					
Date Analysis Commenced	Oct 22, 2025					
Condition of Sample	Contained in two BOD bottles and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)					

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Calcium *	meq/L	0.003	0.005	0.97	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Magnesium *	meq/L	0.003	0.005	0.40	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
SAR *	meq/L	-	-	1.32	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Sodium *	meq/L	0.003	0.005	1.09	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Water Testing							
BOD *	mg/L	-	2	<2.0	≤4	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O C	Rayong
Chlorite *	mg/L	0.05	0.1	Not Detected	No Standard	In-house method : STM 04-061 based on United States Environmental Protection Agency, 1999, EPA Method 300.1	Bangkok
Chlorite *	ug/L	50	100	Not Detected	No Standard	In-house method : STM 04-061 based on United States Environmental Protection Agency, 1999, EPA Method 300.1	Bangkok
Dissolved Oxygen *	mg/L	-	0.1	7.5	≥2	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-O (C)	Rayong
pH at 25 degree C	-	-	-	7.3	5.0-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

87 M.Thai Tower All Season Place, 11th Floor, Wireless Road, Lumpini, Pathumwan,
Bangkok Thailand 10330

P/O : GTS4-4210500514

Project Name : Monitoring EIA

Project Location: GTS4



TESTING
No.0042

Lot ID: 2591905

Date Received : Oct 22, 2025

Date Reported : Nov 04, 2025

Report Number : 3417892-1 C6

Page 4 of 12

Sample Number	2591905-2					
Sampled Date	Oct 22, 2025 9:37 AM					
Sample Description	Surafce water					
Location	คลองระเวียงเหนือเขตพื้นที่นิคมฯ 200 เมตร					
Date Analysis Commenced	Oct 22, 2025					
Condition of Sample	Contained in two BOD bottles and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)					

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Temperature *	Degree C	-	-	27.3	n'	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	228	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C *	mg/L	-	5	29	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)

n': Change from Natural condition not more than 3 degree C

Sampled By : Warunyoo Chimphalee , Patchanan Inprik

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.
- [A] Analysis conducted by ALS Laboratory Group (Thailand) Co.,Ltd. Bangkok Branch, DSS Accreditation No. 0009.
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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

87 M.Thai Tower All Season Place, 11th Floor, Wireless Road, Lumpini, Pathumwan,
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P/O : GTS4-4210500514

Project Name : Monitoring EIA

Project Location: GTS4



TESTING
No.0042

Lot ID: 2591905

Date Received : Oct 22, 2025

Date Reported : Nov 04, 2025

Report Number : 3417892-1 C6

Page 5 of 12

Sample Number	2591905-3					
Sampled Date	Oct 22, 2025 9:59 AM					
Sample Description	Surface water					
Location	คลองกร่ำ หลังผ่านจุดทิ้งน้ำของนิคมฯ 200 เมตร					
Date Analysis Commenced	Oct 22, 2025					
Condition of Sample	Contained in two BOD bottles and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)					

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Calcium *	meq/L	0.003	0.005	1.17	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Magnesium *	meq/L	0.003	0.005	0.33	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
SAR *	meq/L	-	-	2.55	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Sodium *	meq/L	0.003	0.005	2.22	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Water Testing							
BOD *	mg/L	-	2	<2.0	≤4	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O C	Rayong
Chlorite *	mg/L	0.05	0.1	Not Detected	No Standard	In-house method : STM 04-061 based on United States Environmental Protection Agency, 1999, EPA Method 300.1	Bangkok
Chlorite *	ug/L	50	100	Not Detected	No Standard	In-house method : STM 04-061 based on United States Environmental Protection Agency, 1999, EPA Method 300.1	Bangkok
Dissolved Oxygen *	mg/L	-	0.1	7.0	≥2	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-O (C)	Rayong
pH at 25 degree C	-	-	-	7.5	5.0-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

87 M.Thai Tower All Season Place, 11th Floor, Wireless Road, Lumpini, Pathumwan,
Bangkok Thailand 10330

P/O : GTS4-4210500514

Project Name : Monitoring EIA

Project Location: GTS4



TESTING
No.0042

Lot ID: 2591905

Date Received : Oct 22, 2025

Date Reported : Nov 04, 2025

Report Number : 3417892-1 C6

Page 6 of 12

Sample Number	2591905-3					
Sampled Date	Oct 22, 2025 9:59 AM					
Sample Description	Surface water					
Location	คลองกร่ำ หลังผ่านจุดทิ้งน้ำของนิคมฯ 200 เมตร					
Date Analysis Commenced	Oct 22, 2025					
Condition of Sample	Contained in two BOD bottles and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)					

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Temperature *	Degree C	-	-	27.9	n'	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	288	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C *	mg/L	-	5	19	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)

n': Change from Natural condition not more than 3 degree C

Sampled By : Warunyoo Chimphalee , Patchanan Inprik

Remark :

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

Client : Gulf TS4 Co., Ltd.

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Bangkok Thailand 10330

P/O : GTS4-4210500514

Project Name : Monitoring EIA

Project Location: GTS4



TESTING
No.0042

Lot ID: 2591905

Date Received : Oct 22, 2025

Date Reported : Nov 04, 2025

Report Number : 3417892-1 C6

Page 7 of 12

Sample Number	2591905-4					
Sampled Date	Oct 22, 2025 10:27 AM					
Sample Description	Surafce water					
Location	คลองระเรัง หลังฝายบ้านวังเขมยง 200 เมตร					
Date Analysis Commenced	Oct 22, 2025					
Condition of Sample	Contained in two BOD bottles and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)					

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Calcium *	mmol/L	0.002	0.004	0.56	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Magnesium *	meq/L	0.003	0.005	0.37	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
SAR *	-	-	0.10	1.66	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Sodium *	meq/L	0.003	0.005	1.43	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Water Testing							
BOD *	mg/L	-	2	<2.0	≤4	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O C	Rayong
Chlorite *	mg/L	0.05	0.1	Not Detected	No Standard	In-house method : STM 04-061 based on United States Environmental Protection Agency, 1999, EPA Method 300.1	Bangkok
Chlorite *	ug/L	50	100	Not Detected	No Standard	In-house method : STM 04-061 based on United States Environmental Protection Agency, 1999, EPA Method 300.1	Bangkok
Dissolved Oxygen *	mg/L	-	0.1	6.8	≥2	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-O (C)	Rayong
pH at 25 degree C	-	-	-	7.3	5.0-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

87 M.Thai Tower All Season Place, 11th Floor, Wireless Road, Lumpini, Pathumwan,
Bangkok Thailand 10330

P/O : GTS4-4210500514

Project Name : Monitoring EIA

Project Location: GTS4



TESTING
No.0042

Lot ID: 2591905

Date Received : Oct 22, 2025

Date Reported : Nov 04, 2025

Report Number : 3417892-1 C6

Page 8 of 12

Sample Number	2591905-4					
Sampled Date	Oct 22, 2025 10:27 AM					
Sample Description	Surafce water					
Location	คลองระเรัง หลังฝายบ้านวังเขมยง 200 เมตร					
Date Analysis Commenced	Oct 22, 2025					
Condition of Sample	Contained in two BOD bottles and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)					

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Temperature *	Degree C	-	-	27.5	n'	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	266	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C *	mg/L	-	5	96	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)

n': Change from Natural condition not more than 3 degree C

Sampled By : Warunyoo Chimphalee , Patchanon Inprik

Remark :

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

87 M.Thai Tower All Season Place, 11th Floor, Wireless Road, Lumpini, Pathumwan,
Bangkok Thailand 10330

P/O : GTS4-4210500514

Project Name : Monitoring EIA

Project Location: GTS4



TESTING
No.0042

Lot ID: 2591905

Date Received : Oct 22, 2025

Date Reported : Nov 04, 2025

Report Number : 3417892-1 C6

Page 9 of 12

Sample Number	2591905-5					
Sampled Date	Oct 22, 2025 10:53 AM					
Sample Description	Surafce water					
Location	อ่างเก็บน้ำหนองปลาไหล ห่างจากปากคลองระเวิงประมาณ 2 กม.					
Date Analysis Commenced	Oct 22, 2025					
Condition of Sample	Contained in two BOD bottles and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)					

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Calcium *	meq/L	0.003	0.005	0.85	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Magnesium *	meq/L	0.003	0.005	0.29	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
SAR *	-	-	0.10	1.54	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
SAR *	meq/L	-	-	1.54	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Sodium *	meq/L	0.003	0.005	1.17	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Water Testing							
BOD *	mg/L	-	2	<2.0	≤4	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O C	Rayong
Chlorite *	mg/L	0.05	0.1	Not Detected	No Standard	In-house method : STM 04-061 based on United States Environmental Protection Agency, 1999, EPA Method 300.1	Bangkok
Chlorite *	ug/L	50	100	Not Detected	No Standard	In-house method : STM 04-061 based on United States Environmental Protection Agency, 1999, EPA Method 300.1	Bangkok
Dissolved Oxygen *	mg/L	-	0.1	6.7	≥2	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-O (C)	Rayong

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report may be reproduced in any form without written consent from the laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

87 M.Thai Tower All Season Place, 11th Floor, Wireless Road, Lumpini, Pathumwan,
Bangkok Thailand 10330

P/O : GTS4-4210500514

Project Name : Monitoring EIA

Project Location: GTS4



TESTING
No.0042

Lot ID: 2591905

Date Received : Oct 22, 2025

Date Reported : Nov 04, 2025

Report Number : 3417892-1 C6

Page 10 of 12

Sample Number	2591905-5					
Sampled Date	Oct 22, 2025 10:53 AM					
Sample Description	Surafce water					
Location	อ่างเก็บน้ำหนองปลาไหล ห่างจากปากคลองระเวิงประมาณ 2 กม.					
Date Analysis Commenced	Oct 22, 2025					
Condition of Sample	Contained in two BOD bottles and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)					

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
pH at 25 degree C	-	-	-	7.6	5.0-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	30.7	n'	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	180	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C *	mg/L	-	5	6	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)

n': Change from Natural condition not more than 3 degree C

Sampled By : Warunyoo Chimphalee , Patchanon Inprik

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.
- [A] Analysis conducted by ALS Laboratory Group (Thailand) Co.,Ltd. Bangkok Branch, DSS Accreditation No. 0009.
- Sampling is not included in scope of accreditation ISO/IEC 17025

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

87 M.Thai Tower All Season Place, 11th Floor, Wireless Road, Lumpini, Pathumwan,
Bangkok Thailand 10330

P/O : GTS4-4210500514

Project Name : Monitoring EIA

Project Location: GTS4



TESTING
No.0042

Lot ID: 2591905

Date Received : Oct 22, 2025

Date Reported : Nov 04, 2025

Report Number : 3417892-1 C6

Page 11 of 12

Sample Number	2591905-6					
Sampled Date	Oct 22, 2025 11:09 AM					
Sample Description	Surafce water					
Location	อ่างเก็บน้ำหนองปลาไหล ห่างจากปากคลองระเวิงประมาณ 4 กม					
Date Analysis Commenced	Oct 22, 2025					
Condition of Sample	Contained in two BOD bottles and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)					

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Calcium *	meq/L	0.003	0.005	0.83	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Magnesium *	meq/L	0.003	0.005	0.28	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
SAR *	-	-	0.10	1.52	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
SAR *	meq/L	-	-	1.52	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Sodium *	meq/L	0.003	0.005	1.13	No Standard	In-house method : STM 05-014 based on United States Environmental Protection Agency, 1994, EPA Method 200.7	Bangkok
Water Testing							
BOD *	mg/L	-	2	<2.0	≤4	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O C	Rayong
Chlorite *	mg/L	0.05	0.1	Not Detected	No Standard	In-house method : STM 04-061 based on United States Environmental Protection Agency, 1999, EPA Method 300.1	Bangkok
Chlorite *	ug/L	50	100	Not Detected	No Standard	In-house method : STM 04-061 based on United States Environmental Protection Agency, 1999, EPA Method 300.1	Bangkok
Dissolved Oxygen *	mg/L	-	0.1	6.5	≥2	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-O (C)	Rayong

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

87 M.Thai Tower All Season Place, 11th Floor, Wireless Road, Lumpini, Pathumwan,
Bangkok Thailand 10330

P/O : GTS4-4210500514

Project Name : Monitoring EIA

Project Location: GTS4



TESTING
No.0042

Lot ID: 2591905

Date Received : Oct 22, 2025

Date Reported : Nov 04, 2025

Report Number : 3417892-1 C6

Page 12 of 12

Sample Number	2591905-6					
Sampled Date	Oct 22, 2025 11:09 AM					
Sample Description	Surafce water					
Location	อ่างเก็บน้ำหนองปลาไหล ห่างจากปากคลองระเวิงประมาณ 4 กม					
Date Analysis Commenced	Oct 22, 2025					
Condition of Sample	Contained in two BOD bottles and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)					

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
pH at 25 degree C	-	-	-	7.7	5.0-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Rayong
Temperature *	Degree C	-	-	30.3	n'	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Rayong
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	124	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Rayong
Total Suspended Solids Dried at 103-105 degree C *	mg/L	-	5	8	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Rayong

Guideline : Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act. B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)

n': Change from Natural condition not more than 3 degree C

Sampled By : Warunyoo Chimphalee , Patchanon Inprik

Remark :

- LOD : Limit of Detection
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ภาคผนวก ค-7

ระดับเสียงภายในสถานประกอบการ



Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O : 4210502315

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2566513

Date Received : Aug 04, 2025

Date Reported : Aug 08, 2025

Report Number: 3378795-1

Page 1 of 1

Sample Number	2566513-1
Parameter	Noise (Leq 8 hrs.)
Location	บริเวณ Cooling Tower
Measurement Date	Aug 01, 2025
Measurement by	Prasanmit Kueanpet

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:41 AM - 10:41 AM	79.0	89.9	78.6
10:41 AM - 11:41 AM	78.6	78.9	78.5
11:41 AM - 12:41 PM	78.6	84.2	78.6
12:41 PM - 01:41 PM	78.6	79.0	78.5
01:41 PM - 02:41 PM	78.4	79.2	78.3
02:41 PM - 03:41 PM	78.5	78.9	78.4
03:41 PM - 04:41 PM	78.5	79.0	78.4
04:41 PM - 05:41 PM	78.4	79.0	78.3
Leq Average 8 hrs. (dB(A))	78.6		
Lmax (dB(A))		89.9	
Standard (dB(A))	85	140	
Reference Method	: ISO 1996-1 : 2016		
Standard	: Environmental Impact Assessment Report of Gulf TS4 Co., Ltd. ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย ในการประกอบกิจการโรงงานเกี่ยวกับสภาวะแวดล้อมในการทำงาน พ.ศ.๒๕๔๖		

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Chonticha Subongkoch
Scientist (3)

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O : 4210502315

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2566513

Date Received : Aug 04, 2025

Date Reported : Aug 08, 2025

Report Number: 3378796-1

Page 1 of 1

Sample Number	2566513-2
Parameter	Noise (Leq 8 hrs.)
Location	บริเวณ Boiler Feed Pump
Measurement Date	Aug 01, 2025
Measurement by	Prasanmit Kueanpet

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:47 AM - 10:47 AM	81.8	84.7	81.3
10:47 AM - 11:47 AM	81.3	85.5	81.0
11:47 AM - 12:47 PM	81.0	82.4	80.8
12:47 PM - 01:47 PM	80.9	83.3	80.6
01:47 PM - 02:47 PM	81.1	83.3	80.8
02:47 PM - 03:47 PM	80.8	81.6	80.6
03:47 PM - 04:47 PM	80.8	81.5	80.6
04:47 PM - 05:47 PM	80.9	82.0	80.7
Leq Average 8 hrs. (dB(A))	81.1		
Lmax (dB(A))		85.5	
Standard (dB(A))	85	140	
Reference Method	: ISO 1996-1 : 2016		
Standard	: Environmental Impact Assessment Report of Gulf TS4 Co., Ltd. ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย ในการประกอบกิจการโรงงานเกี่ยวกับสภาวะแวดล้อมในการทำงาน พ.ศ.๒๕๔๖		

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O : 4210502315

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2566513

Date Received : Aug 04, 2025

Date Reported : Aug 08, 2025

Report Number: 3378797-1

Page 1 of 1

Sample Number 2566513-3
Parameter Noise (Leq 8 hrs.)
Location บริเวณ Gas Metering
Measurement Date Aug 01, 2025
Measurement by Prasanmit Kueanpet

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:51 AM - 10:51 AM	64.4	80.7	63.9
10:51 AM - 11:51 AM	64.1	73.4	63.8
11:51 AM - 12:51 PM	63.4	66.1	63.0
12:51 PM - 01:51 PM	63.9	73.3	63.3
01:51 PM - 02:51 PM	63.9	69.1	63.6
02:51 PM - 03:51 PM	64.0	66.3	63.7
03:51 PM - 04:51 PM	63.9	67.2	63.7
04:51 PM - 05:51 PM	64.1	76.1	63.8

Leq Average 8 hrs. (dB(A))

64.0

Lmax (dB(A))

80.7

Standard (dB(A))

85

140

Reference Method : ISO 1996-1 : 2016

Standard : Environmental Impact Assessment Report of Gulf TS4 Co., Ltd.

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O : 4210502315

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2566513

Date Received : Aug 04, 2025

Date Reported : Aug 08, 2025

Report Number: 3378798-1

Page 1 of 1

Sample Number 2566513-4
Parameter Noise (Leq 8 hrs.)
Location บริเวณ Gas Turbine Accessories System (ทั้งกลางระหว่าง GTG 11 และ GTG12)
Measurement Date Aug 01, 2025
Measurement by Prasanmit Kueanpet

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:45 AM - 10:45 AM	77.0	78.4	76.6
10:45 AM - 11:45 AM	76.8	78.5	76.4
11:45 AM - 12:45 PM	76.7	78.7	76.1
12:45 PM - 01:45 PM	76.7	78.6	76.0
01:45 PM - 02:45 PM	77.0	78.6	76.5
02:45 PM - 03:45 PM	77.1	79.0	76.6
03:45 PM - 04:45 PM	77.1	78.7	76.7
04:45 PM - 05:45 PM	77.2	79.0	76.7

Leq Average 8 hrs. (dB(A))

77.0

Lmax (dB(A))

79.0

Standard (dB(A))

85

140

Reference Method : ISO 1996-1 : 2016

Standard : Environmental Impact Assessment Report of Gulf TS4 Co., Ltd.

ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O : 4210502315

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2566513

Date Received : Aug 04, 2025

Date Reported : Aug 08, 2025

Report Number: 3378799-1

Page 1 of 1

Sample Number	2566513-5
Parameter	Noise (Leq 8 hrs.)
Location	บริเวณ Steam Turbine Generator
Measurement Date	Aug 01, 2025
Measurement by	Prasanmit Kueanpet

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:33 AM - 10:33 AM	76.7	78.0	76.4
10:33 AM - 11:33 AM	76.7	77.3	76.5
11:33 AM - 12:33 PM	76.6	77.4	76.4
12:33 PM - 01:33 PM	76.8	77.8	76.5
01:33 PM - 02:33 PM	76.7	77.7	76.4
02:33 PM - 03:33 PM	76.8	77.5	76.5
03:33 PM - 04:33 PM	76.4	77.2	76.2
04:33 PM - 05:33 PM	76.6	77.4	76.4

Leq Average 8 hrs. (dB(A))

76.7

Lmax (dB(A))

78.0

Standard (dB(A))

85

140

Reference Method : ISO 1996-1 : 2016

Standard : Environmental Impact Assessment Report of Gulf TS4 Co., Ltd.

ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

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P/O : 4210502315

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2566513

Date Received : Aug 04, 2025

Date Reported : Aug 08, 2025

Report - uNber: 33788009L

Page 1 of 1

Sample Number	25m6139m
Parameter	- oise 6Le(8 hrs.q
Location	บริเวณ SteaN Turbine Lube) il Skid
Measurement Date	Aug 01, 2025
Measurement by	PrasanN it Kueanpet

TIN e	Le(6dB6Aq	LN ax 6dB6Aq	LC0 6dB6Aq
00:31 AM 910:31 AM	75.1	7m2	74.8
10:31 AM 911:31 AM	74.0	7m0	74.5
11:31 AM 912:31 PM	74.7	75.7	74.2
12:31 PM 901:31 PM	74.0	7m3	74.1
01:31 PM 902:31 PM	75.3	7m3	75.1
02:31 PM 903:31 PM	75.2	7m0	74.0
03:31 PM 904:31 PM	75.2	7m0	74.0
04:31 PM 905:31 PM	75.2	7m0	75.0

Le(Average 8 hrs. 6dB6Aq

75.1

LN ax 6dB6Aq

7m3

Standard 6dB6Aq

85

140

Reference Method : IS) 100m6l : 201m

Standard : EnvironNental IN pact AssessNent Report of Gulf TS4 Co., Ltd.

ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
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Technical Management

Chontichak

Chonticha Subongkoch
Scientist 63q

Approved by

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S:\Reports_Air Noise.rpt (2:30PM)



Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O : 4210502708

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 25100116

Date Received : Nov 11, 2025

Date Reported : Nov 14, 2025

Report Number: 3450768-1

Page 1 of 1

Sample Number	25100116-1
Parameter	Noise (Leq 8 hrs.)
Location	บริเวณ Cooling Tower
Measurement Date	Nov 10, 2025
Measurement by	Nattakarn Vonginyoo

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:42 AM - 10:42 AM	77.3	79.0	77.2
10:42 AM - 11:42 AM	77.3	77.9	77.2
11:42 AM - 12:42 PM	77.4	77.9	77.3
12:42 PM - 01:42 PM	77.5	79.2	77.3
01:42 PM - 02:42 PM	77.6	78.1	77.5
02:42 PM - 03:42 PM	77.6	78.1	77.5
03:42 PM - 04:42 PM	77.5	78.2	77.4
04:42 PM - 05:42 PM	77.5	79.2	77.3

Leq Average 8 hrs. (dB(A))

77.5

Lmax (dB(A))

79.2

Standard (dB(A))

85

140

Reference Method : ISO 1996-1 : 2016

Standard : Environmental Impact Assessment Report of Gulf TS4 Co., Ltd.

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Technical Management

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Thanita Kulsuriwong
Scientist (4)

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O : 4210502708

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 25100116

Date Received : Nov 11, 2025

Date Reported : Nov 14, 2025

Report Number: 3450769-1

Page 1 of 1

Sample Number	25100116-2
Parameter	Noise (Leq 8 hrs.)
Location	บริเวณ Boiler Feed Pump
Measurement Date	Nov 10, 2025
Measurement by	Nattakarn Vonginyoo

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:24 AM - 10:24 AM	81.7	87.7	81.3
10:24 AM - 11:24 AM	81.5	85.4	81.1
11:24 AM - 12:24 PM	81.3	84.7	81.0
12:24 PM - 01:24 PM	81.4	84.7	80.9
01:24 PM - 02:24 PM	81.7	83.4	81.3
02:24 PM - 03:24 PM	81.2	82.8	81.0
03:24 PM - 04:24 PM	81.5	94.1	81.1
04:24 PM - 05:24 PM	81.6	84.9	81.1

Leq Average 8 hrs. (dB(A))

81.5

Lmax (dB(A))

94.1

Standard (dB(A))

85

140

Reference Method : ISO 1996-1 : 2016

Standard : Environmental Impact Assessment Report of Gulf TS4 Co., Ltd.

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Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O : 4210502708

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 25100116

Date Received : Nov 11, 2025

Date Reported : Nov 14, 2025

Report Nu- ber: 345077061

Page 1 of 1

Sample Number	251001166
Parameter	Noise (Leq 8 hrs.)
Location	บริเวณ Gas Metering
Measurement Date	Nov 10, 2025
Measurement by	Nattakarn wonginyoo

TI- e	Leq (dV(A))	L- aB (dV(A))	Lx0 (dV(A))
0x:32 AM 610:32 AM	m2.7	m8.7	m2.3
10:32 AM 611:32 AM	m2.5	mm4	m2.1
11:32 AM 612:32 PM	m2.3	m5.7	m2.0
12:32 PM 601:32 PM	m2.4	m5.7	m1.x
01:32 PM 602:32 PM	m2.7	m4.4	m2.3
02:32 PM 603:32 PM	m2.2	m8.8	m2.0
03:32 PM 604:32 PM	m2.5	75.1	m2.1
04:32 PM 605:32 PM	m2.m	m5.x	m2.1

Leq Average 8 hrs. (dV(A))

m2.5

L- aB (dV(A))

75.1

Standard (dV(A))

85

140

Reference Method : IS9 1xxm61 : 201m

Standard : Environ- ental I- pact Assess- ent Report of Gulf TS4 Co., Ltd.

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Technical Management

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O : 4210502708

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 25100116

Date Received : Nov 11, 2025

Date Reported : Nov 14, 2025

Report Nu- ber: 345077161

Page 1 of 1

Sample Number	251001166
Parameter	Noise (Leq 8 hrs.)
Location	บริเวณ Gas Turbine Accessories Syste- (กึ่งกลางระหว่าง GTG 11 และ GTG12)
Measurement Date	Nov 10, 2025
Measurement by	Nattakarn wonginyoo

TI- e	Leq (dV(A))	L- aB (dV(A))	Lx0 (dV(A))
0x:31 AM 610:31 AM	73.0	82.5	71.5
10:31 AM 611:31 AM	72.3	7m2	71.1
11:31 AM 612:31 PM	75.0	81.2	71.5
12:31 PM 601:31 PM	77.1	7x.x	75.3
01:31 PM 602:31 PM	78.3	80.8	77.1
02:31 PM 603:31 PM	78.3	80.5	77.4
03:31 PM 604:31 PM	77.8	87.0	7mx
04:31 PM 605:31 PM	77.m	80.4	75.8

Leq Average 8 hrs. (dV(A))

7m7

L- aB (dV(A))

87.0

Standard (dV(A))

85

140

Reference Method : IS9 1xxm61 : 201m

Standard : Environ- ental I- pact Assess- ent Report of Gulf TS4 Co., Ltd.

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140
P/O : 4210502708
Project Name : Monitoring EIA
Project Location : GTS4

Lot ID: 25100116
Date Received : Nov 11, 2025
Date Reported : Nov 14, 2025
Report Nu- ber: 345077261

Page 1 of 1

Sample Number	2510011๓๕		
Parameter	Noise (Leq 8 hrs.)		
Location	บริเวณ Stea- Turbine Generator		
Measurement Date	Nov 10, 2025		
Measurement by	Nattakarn wonginyoo		
TI- e	Leq (dV(A))	L- aB (dV(A))	Lx0 (dV(A))
0x:2x AM 610:2x AM	78.5	84.m	78.1
10:2x AM 611:2x AM	78.m	84.8	78.1
11:2x AM 612:2x PM	78.5	80.x	78.2
12:2x PM 601:2x PM	78.4	80.1	78.0
01:2x PM 602:2x PM	78.0	78.x	77.8
02:2x PM 603:2x PM	78.0	7x.1	77.8
03:2x PM 604:2x PM	78.m	x0.x	77.x
04:2x PM 605:2x PM	78.5	80.x	78.2
Leq Average 8 hrs. (dV(A))	78.4		
L- aB (dV(A))		x0.x	
Standard (dV(A))	85	140	
Reference Method : IS9 1xxn๖l : 201m			
Standard : Environ- ental I- pact Assess- ent Report of Gulf TS4 Co., Ltd. ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย ในการประกอบกิจการโรงงานเกี่ยวกับสภาวะแวดล้อมในการทำงาน พ.ศ.๒๕๔๖			

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Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140
P/O : 4210502708
Project Name : Monitoring EIA
Project Location : GTS4

Lot ID: 25100116
Date Received : Nov 11, 2025
Date Reported : Nov 14, 2025
Report Nu- ber: 345077361

Page 1 of 1

Sample Number	2510011๓๕		
Parameter	Noise (Leq 8 hrs.)		
Location	บริเวณ Stea- Turbine Lube wil Skid		
Measurement Date	Nov 10, 2025		
Measurement by	Nattakarn Vonginyoo		
TI- e	Leq (dB(A))	L- ax (dB(A))	L90 (dB(A))
09:00 AM 610:00 AM	74.3	75.9	73.8
10:00 AM 611:00 AM	74.5	77.0	73.9
11:00 AM 612:00 PM	74.m	7mm	74.1
12:00 PM 601:00 PM	75.m	79.1	74.2
01:00 PM 602:00 PM	7m1	82.0	74.9
02:00 PM 603:00 PM	7m0	81.4	74.m
03:00 PM 604:00 PM	78.4	97.1	74.7
04:00 PM 605:00 PM	78.1	84.0	7m9
Leq Average 8 hrs. (dB(A))	7m2		
L- ax (dB(A))		97.1	
Standard (dB(A))	85	140	
Reference Method : ISw 199๓๖l : 201m			
Standard : Environ- ental I- pact Assess- ent Report of Gulf TS4 Co., Ltd. ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย ในการประกอบกิจการโรงงานเกี่ยวกับสภาวะแวดล้อมในการทำงาน พ.ศ.๒๕๔๖			

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng,
Rayong Thailand 21140

P/O : 4210502315

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2566514

Date Received : Aug 04, 2025

Date Reported : Aug 07, 2025

Report Number: 3358963-1

Page 1 of 4

Sample Number 2566514-1
Parameter Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)
Measurement Date Aug 01, 2025
Measurement by Nattakarn Vonginyoo
Location ปรุขันธ์ดงงาน 1 พื้นที่ (ชื่อ-นามสกุล ปรุขันธ์ดงงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
บริเวณ Condenser Exhaust Unit	120	32.9	28.7	45.2	37.9
Average (WBGT)		32.9			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
2. Ministerial Regulation on Prescribing of Standard for Administration and Management of Occupational Safety, Health and Environment in relation to Heat, Light and Noise, B.E.2559

Technical Management

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Analysis / Test Report

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225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng,
Rayong Thailand 21140

P/O : 4210502315

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2566514

Date Received : Aug 04, 2025

Date Reported : Aug 07, 2025

Report Number: 3358963-1

Page 2 of 4

Sample Number 2566514-2
Parameter Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)
Measurement Date Aug 01, 2025
Measurement by Nattakarn Vonginyoo
Location ปรุขันธ์ดงงาน 1 พื้นที่ (ชื่อ-นามสกุล ปรุขันธ์ดงงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
บริเวณท่อลำเลียงไอน้ำ	120	29.3	26.1	36.7	36.1
Average (WBGT)		29.3			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
2. Ministerial Regulation on Prescribing of Standard for Administration and Management of Occupational Safety, Health and Environment in relation to Heat, Light and Noise, B.E.2559

Technical Management

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Section Head

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng,
Rayong Thailand 21140

P/O : 4210502315

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2566514

Date Received : Aug 04, 2025

Date Reported : Aug 07, 2025

Report Number: 3358963-1

Page 3 of 4

Sample Number 2566514-3
Parameter Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)
Measurement Date Aug 01, 2025
Measurement by Nattakarn Vonginyoo
Location ปรุขันธ์ดงงาน 1 พื้นที่ (ชื่อ-นามสกุล ปรุขันธ์ดงงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
บริเวณ Generator	120	28.8	25.9	35.9	34.6
Average (WBGT)		28.8			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
2. Ministerial Regulation on Prescribing of Standard for Administration and Management of Occupational Safety, Health and Environment in relation to Heat, Light and Noise, B.E.2559

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Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng,
Rayong Thailand 21140

P/O : 4210502315

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 2566514

Date Received : Aug 04, 2025

Date Reported : Aug 07, 2025

Report Number: 3358963-1

Page 4 of 4

Sample Number 2566514-4
Parameter Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)
Measurement Date Aug 01, 2025
Measurement by Nattakarn Vonginyoo
Location ปรุขันธ์ดงงาน 1 พื้นที่ (ชื่อ-นามสกุล ปรุขันธ์ดงงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
บริเวณ Gas Turbine	120	29.6	27.2	35.4	34.4
Average (WBGT)		29.6			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
2. Ministerial Regulation on Prescribing of Standard for Administration and Management of Occupational Safety, Health and Environment in relation to Heat, Light and Noise, B.E.2559

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Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng,
Rayong Thailand 21140

P/O : 4210502c0v

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 25100128

Date Received : 7 o8 11, 2025

Date Reported : 7 o8 14, 2025

Report Number: 343c6- 1N

Page 1 of 4

Sample Number 2510012vN
Parameter Heat Stress (Sampling Time : 11.30 PM N01.30 PM)
Measurement Date 7 o8 10, 2025
Measurement by 7attakarn Vonginyoo
Location ปฏบัติงาน 1 พื้นที่ (ชื่ออาคารชุด อุปกรณ์ใช้งาน : หมายเลข : N)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
บริเวณ Condenser Exhaust Unit	120	30.4	2v.0	3- .4	35.0
A8erage (WBGT)		30.4			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 25- 1)
2. Ministerial Regulation on Prescribing of Standard for Administration and Management of Occupational Safety, Health and Environment in relation to Heat, Light and Noise, B.E.2556

Technical Management

Supot Salamteh
Section Head

Approved by

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng,
Rayong Thailand 21140

P/O : 4210502c0v

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 25100128

Date Received : 7 o8 11, 2025

Date Reported : 7 o8 14, 2025

Report Number: 343c6- 1N

Page 4 of 4

Sample Number 2510012vN
Parameter Heat Stress (Sampling Time : 06.30 AM N11.30 PM)
Measurement Date 7 o8 10, 2025
Measurement by 7attakarn Vonginyoo
Location ปฏบัติงาน 1 พื้นที่ (ชื่ออาคารชุด อุปกรณ์ใช้งาน : หมายเลข : N)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
บริเวณ Gas Turbine	120	33.5	32.4	3- .v	34.5
A8erage (WBGT)		33.5			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 25- 1)
2. Ministerial Regulation on Prescribing of Standard for Administration and Management of Occupational Safety, Health and Environment in relation to Heat, Light and Noise, B.E.2556

Technical Management

Supot Salamteh
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225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng,
Rayong Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 25107383

Date Received : Nov 25, 2025

Date Reported : Nov 28, 2025

Report Number: 3456816-1

Page 1 of 2

Sample Number 25107383-1
Parameter Heat Stress (Sampling Time : 01.10 PM - 03.10 PM)
Measurement Date Nov 25, 2025
Measurement by Nattakarn Vonginyoo
Location ปรุขันธ์ดงงาน 1 พื้นที่ (ชื่อ-นามสกุล ปรุขันธ์ดงงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
บริเวณท่อลำเลียงไอน้ำ (GT11)	120	24.4	21.7	30.6	30.5
Average (WBGT)		24.4			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

- Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
- Ministerial Regulation on Prescribing of Standard for Administration and Management of Occupational Safety, Health and Environment in relation to Heat, Light and Noise, B.E.2559

Technical Management

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Section Head

Approved by

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Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng,
Rayong Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location : GTS4

Lot ID: 25107383

Date Received : Nov 25, 2025

Date Reported : Nov 28, 2025

Report Number: 3456816-1

Page 2 of 2

Sample Number 25107383-2
Parameter Heat Stress (Sampling Time : 01.10 PM - 03.10 PM)
Measurement Date Nov 25, 2025
Measurement by Nattakarn Vonginyoo
Location ปรุขันธ์ดงงาน 1 พื้นที่ (ชื่อ-นามสกุล ปรุขันธ์ดงงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
บริเวณ Generator (GT11)	120	29.3	24.0	42.6	39.6
Average (WBGT)		29.3			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

- Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)
- Ministerial Regulation on Prescribing of Standard for Administration and Management of Occupational Safety, Health and Environment in relation to Heat, Light and Noise, B.E.2559

Technical Management

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Section Head

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ภาคผนวก ค-9

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location: GTS4

Lot ID: 2566510 (1)

Date Received : Aug 03, 2025

Date Reported : Aug 07, 2025

Report Number: 2566510 (1)-1 C1

Page 1 of 2

GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Spot : Administration Building : 1st Floor : เครื่องถ่ายเอกสาร	2566510 (1)-1	1-Aug-25	Day time	1	731	-	300-400	-	Pass
2	Spot : Administration Building : 1st Floor : โต๊ะ Admin. 1	2566510 (1)-2	1-Aug-25	Day time	1	442	-	400-500	-	Pass
3	Spot : Administration Building : 1st Floor : โต๊ะ Admin. 2	2566510 (1)-3	1-Aug-25	Day time	1	669	-	400-500	-	Pass
4	Spot : Administration Building : 1st Floor : โต๊ะ Operation Manager	2566510 (1)-4	1-Aug-25	Day time	1	528	-	400-500	-	Pass
5	Spot : Administration Building : 1st Floor : โต๊ะ EHS	2566510 (1)-5	1-Aug-25	Day time	1	839	-	400-500	-	Pass
6	Spot : Administration Building : 1st Floor : โต๊ะ EHS Manager	2566510 (1)-6	1-Aug-25	Day time	1	992	-	400-500	-	Pass
7	Spot : Administration Building : 1st Floor : โต๊ะ Admin. Manager	2566510 (1)-7	1-Aug-25	Day time	1	632	-	400-500	-	Pass
8	Spot : Administration Building : 1st Floor : โต๊ะ Plant Manager	2566510 (1)-8	1-Aug-25	Day time	1	519	-	400-500	-	Pass
9	Spot : Administration Building : 1st Floor : โต๊ะ IT	2566510 (1)-9	1-Aug-25	Day time	1	436	-	400-500	-	Pass
10	Spot : Administration Building : 1st Floor : โต๊ะ จัดซื้อ 1	2566510 (1)-10	1-Aug-25	Day time	1	461	-	400-500	-	Pass
11	Spot : Administration Building : 1st Floor : โต๊ะ จัดซื้อ 2	2566510 (1)-11	1-Aug-25	Day time	1	550	-	400-500	-	Pass
12	Area : Administration Building : 1st Floor : ทางเดิน	2566510 (1)-12	1-Aug-25	Day time	1	318	470	50	100	Pass
		2566510 (1)-13	1-Aug-25	Day time	2	516				
		2566510 (1)-14	1-Aug-25	Day time	3	469				
		2566510 (1)-15	1-Aug-25	Day time	4	449				
		2566510 (1)-16	1-Aug-25	Day time	5	298				
		2566510 (1)-17	1-Aug-25	Day time	6	768				
13	Area : Administration Building : 1st Floor : ห้องเก็บเอกสาร	2566510 (1)-18	1-Aug-25	Day time	1	1,206	853	100	200	Pass
		2566510 (1)-19	1-Aug-25	Day time	2	500				

Technical Management

Supot S.

Supot Salamteh
Section Head

Approved by

Nichan Chonharat

Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location: GTS4

Lot ID: 2566510 (1)

Date Received : Aug 03, 2025

Date Reported : Aug 07, 2025

Report Number: 2566510 (1)-1 C1

Page 2 of 2

GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
15	Area : Administration Building : 1st Floor : ห้องประชุมใหญ่	2566510 (1)-20	1-Aug-25	Day time	1	455	612	150	300	Pass
		2566510 (1)-21	1-Aug-25	Day time	2	499				
		2566510 (1)-22	1-Aug-25	Day time	3	567				
		2566510 (1)-23	1-Aug-25	Day time	4	590				
		2566510 (1)-24	1-Aug-25	Day time	5	674				
		2566510 (1)-25	1-Aug-25	Day time	6	710				
		2566510 (1)-26	1-Aug-25	Day time	7	664				
		2566510 (1)-27	1-Aug-25	Day time	8	583				
		2566510 (1)-28	1-Aug-25	Day time	9	725				
		2566510 (1)-29	1-Aug-25	Day time	10	645				
		2566510 (1)-30	1-Aug-25	Day time	11	681				
		2566510 (1)-31	1-Aug-25	Day time	12	551				
16	Area : Administration Building : 1st Floor : ห้องรับแขก	2566510 (1)-32	1-Aug-25	Day time	1	450	440	50	100	Pass
		2566510 (1)-33	1-Aug-25	Day time	2	483				
		2566510 (1)-34	1-Aug-25	Day time	3	409				
		2566510 (1)-35	1-Aug-25	Day time	4	417				
17	Area : Administration Building : 1st Floor : ห้องประชุมเล็ก	2566510 (1)-36	1-Aug-25	Day time	1	640	598	150	300	Pass
		2566510 (1)-37	1-Aug-25	Day time	2	466				
		2566510 (1)-38	1-Aug-25	Day time	3	617				
		2566510 (1)-39	1-Aug-25	Day time	4	670				

Measurement by : Nattakarn Vonginyoo

Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

Technical Management

Supot S.

Supot Salamteh
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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140
P/O :
Project Name : Monitoring EIA
Project Location: GTS4

Lot ID: 2566510 (2)

Date Received : Aug 03, 2025
Date Reported : Aug 07, 2025
Report Number: 2566510 (2)-1 C1

Page 1 of 2

GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : CCR : Control Building : 1st Floor : Switchgear Room	2566510 (2)-1	1-Aug-25	Day time	1	825	512	100	200	Pass
		2566510 (2)-2	1-Aug-25	Day time	2	450				
		2566510 (2)-3	1-Aug-25	Day time	3	714				
		2566510 (2)-4	1-Aug-25	Day time	4	625				
		2566510 (2)-5	1-Aug-25	Day time	5	538				
		2566510 (2)-6	1-Aug-25	Day time	6	211				
		2566510 (2)-7	1-Aug-25	Day time	7	461				
		2566510 (2)-8	1-Aug-25	Day time	8	477				
		2566510 (2)-9	1-Aug-25	Day time	9	559				
		2566510 (2)-10	1-Aug-25	Day time	10	316				
		2566510 (2)-11	1-Aug-25	Day time	11	625				
		2566510 (2)-12	1-Aug-25	Day time	12	635				
		2566510 (2)-13	1-Aug-25	Day time	13	388				
		2566510 (2)-14	1-Aug-25	Day time	14	503				
		2566510 (2)-15	1-Aug-25	Day time	15	581				
		2566510 (2)-16	1-Aug-25	Day time	16	446				
		2566510 (2)-17	1-Aug-25	Day time	17	510				
		2566510 (2)-18	1-Aug-25	Day time	18	465				
		2566510 (2)-19	1-Aug-25	Night time	1	847	525	100	200	Pass
		2566510 (2)-20	1-Aug-25	Night time	2	572				
		2566510 (2)-21	1-Aug-25	Night time	3	695				
		2566510 (2)-22	1-Aug-25	Night time	4	661				
		2566510 (2)-23	1-Aug-25	Night time	5	335				
		2566510 (2)-24	1-Aug-25	Night time	6	517				
		2566510 (2)-25	1-Aug-25	Night time	7	551				
		2566510 (2)-26	1-Aug-25	Night time	8	544				
		2566510 (2)-27	1-Aug-25	Night time	9	574				
		2566510 (2)-28	1-Aug-25	Night time	10	662				
		2566510 (2)-29	1-Aug-25	Night time	11	462				
		2566510 (2)-30	1-Aug-25	Night time	12	331				
		2566510 (2)-31	1-Aug-25	Night time	13	613				
		2566510 (2)-32	1-Aug-25	Night time	14	504				
		2566510 (2)-33	1-Aug-25	Night time	15	492				
		2566510 (2)-34	1-Aug-25	Night time	16	463				
		2566510 (2)-35	1-Aug-25	Night time	17	622				
		2566510 (2)-36	1-Aug-25	Night time	18	475				

Technical Management

Supot S.
Supot Salamteh
Section Head

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Wichan Choonharat
Assistant Manager

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Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140
P/O :
Project Name : Monitoring EIA
Project Location: GTS4

Lot ID: 2566510 (2)

Date Received : Aug 03, 2025
Date Reported : Aug 07, 2025
Report Number: 2566510 (2)-1 C1

Page 2 of 2

GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
2	Area : CCR : Control Building : 1st Floor : ทางเดินบันได	2566510 (2)-37	1-Aug-25	Day time	1	233	312	50	100	Pass
		2566510 (2)-38	1-Aug-25	Day time	2	391				
		2566510 (2)-39	1-Aug-25	Night time	1	104				
		2566510 (2)-40	1-Aug-25	Night time	2	128				

Measurement by : Nattakarn Vonginyoo

Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

Technical Management

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Supot Salamteh
Section Head

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Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location: GTS4

Lot ID: 2566510 (3)

Date Received : Aug 03, 2025

Date Reported : Aug 07, 2025

Report Number: 2566510 (3)-1 C1

Page 1 of 2

GTS4											
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment	
						Spot	Average	Spot/Min	Average		
1	Spot : CCR : Control Building : 3rd Floor : Control GTS3 No.1	2566510 (3)-1	1-Aug-25	Day time	1	477	-	400-500	-	Pass	
		2566510 (3)-2	1-Aug-25	Night time	1	464	-	400-500	-	Pass	
2	Spot : CCR : Control Building : 3rd Floor : Control GTS3 No.2	2566510 (3)-3	1-Aug-25	Day time	1	426	-	400-500	-	Pass	
		2566510 (3)-4	1-Aug-25	Night time	1	435	-	400-500	-	Pass	
3	Spot : CCR : Control Building : 3rd Floor : Control GTS4 No.1	2566510 (3)-5	1-Aug-25	Day time	1	595	-	400-500	-	Pass	
		2566510 (3)-6	1-Aug-25	Night time	1	657	-	400-500	-	Pass	
4	Spot : CCR : Control Building : 3rd Floor : Control GTS4 No.2	2566510 (3)-7	1-Aug-25	Day time	1	561	-	400-500	-	Pass	
		2566510 (3)-8	1-Aug-25	Night time	1	565	-	400-500	-	Pass	
5	Spot : CCR : Control Building : 3rd Floor : DCS	2566510 (3)-9	1-Aug-25	Day time	1	543	-	400-500	-	Pass	
		2566510 (3)-10	1-Aug-25	Night time	1	447	-	400-500	-	Pass	
6	Spot : CCR : Control Building : 3rd Floor : เครื่องถ่ายเอกสาร	2566510 (3)-11	1-Aug-25	Day time	1	384	-	300-400	-	Pass	
		2566510 (3)-12	1-Aug-25	Night time	1	310	-	300-400	-	Pass	
7	Spot : CCR : Control Building : 3rd Floor : เครื่องส่งแฟกซ์และเครื่องปริ้นเอกสาร	2566510 (3)-13	1-Aug-25	Day time	1	620	-	300-400	-	Pass	
		2566510 (3)-14	1-Aug-25	Night time	1	639	-	300-400	-	Pass	
8	Spot : CCR : Control Building : 3rd Floor : โต๊ะ Daytime Operation	2566510 (3)-15	1-Aug-25	Day time	1	841	-	400-500	-	Pass	
9	Spot : CCR : Control Building : 3rd Floor : โต๊ะ Operation Manager	2566510 (3)-16	1-Aug-25	Day time	1	516	-	400-500	-	Pass	
		2566510 (3)-17	1-Aug-25	Day time	1	644	-	400-500	-	Pass	
10	Spot : CCR : Control Building : 3rd Floor : โต๊ะ Permit	2566510 (3)-18	1-Aug-25	Night time	1	630	-	400-500	-	Pass	
		2566510 (3)-19	1-Aug-25	Day time	1	595	-	400-500	-	Pass	
11	Spot : CCR : Control Building : 3rd Floor : โต๊ะ Shift Leader Daytime	2566510 (3)-20	1-Aug-25	Night time	1	689	-	400-500	-	Pass	
		2566510 (3)-21	1-Aug-25	Day time	1	614	-	400-500	-	Pass	
12	Spot : CCR : Control Building : 3rd Floor : โต๊ะ Shift Leader GTS3	2566510 (3)-22	1-Aug-25	Night time	1	603	-	400-500	-	Pass	
		2566510 (3)-23	1-Aug-25	Day time	1	620	-	400-500	-	Pass	
13	Spot : CCR : Control Building : 3rd Floor : โต๊ะ Shift Leader GTS4	2566510 (3)-24	1-Aug-25	Night time	1	620	-	400-500	-	Pass	

Technical Management

Supot S.
Supot Salamteh
Section Head

Approved by

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location: GTS4

Lot ID: 2566510 (3)

Date Received : Aug 03, 2025

Date Reported : Aug 07, 2025

Report Number: 2566510 (3)-1 C1

Page 2 of 2

GTS4											
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment	
						Spot	Average	Spot/Min	Average		
14	Area : CCR : Control Building : 3rd Floor : ทางเดิน	2566510 (3)-25	1-Aug-25	Day time	1	867	747	50	100	Pass	
		2566510 (3)-26	1-Aug-25	Day time	2	835					
		2566510 (3)-27	1-Aug-25	Day time	3	768					
		2566510 (3)-28	1-Aug-25	Day time	4	539					
		2566510 (3)-29	1-Aug-25	Day time	5	726					
		2566510 (3)-30	1-Aug-25	Night time	1	644	744	50	100	Pass	
		2566510 (3)-31	1-Aug-25	Night time	2	792					
		2566510 (3)-32	1-Aug-25	Night time	3	731					
		2566510 (3)-33	1-Aug-25	Night time	4	706					
		2566510 (3)-34	1-Aug-25	Night time	5	847					
15	Area : CCR : Control Building : 3rd Floor : ทางเดินบันได	2566510 (3)-35	1-Aug-25	Day time	1	429	598	50	100	Pass	
		2566510 (3)-36	1-Aug-25	Day time	2	768					
		2566510 (3)-37	1-Aug-25	Night time	1	156	153	50	100	Pass	
		2566510 (3)-38	1-Aug-25	Night time	2	150					

Measurement by : Nattakarn Vonginyoo

Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

Technical Management

Supot S.
Supot Salamteh
Section Head

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140
P/O :
Project Name : Monitoring EIA
Project Location: GTS4

Lot ID: 2566510 (4)

Date Received : Aug 03, 2025
Date Reported : Aug 07, 2025
Report Number: 2566510 (4)-1 C1

Page 1 of 2

GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : Electrical Building : ชั้น 2 : Battery Room	2566510 (4)-1	1-Aug-25	Day time	1	539		100	200	Pass
		2566510 (4)-2	1-Aug-25	Day time	2	245				
		2566510 (4)-3	1-Aug-25	Night time	1	695	593	100	200	Pass
		2566510 (4)-4	1-Aug-25	Night time	2	491				
2	Area : Electrical Building : ชั้น 2 : Electrical Room	2566510 (4)-5	1-Aug-25	Day time	1	1,750	1874	100	200	Pass
		2566510 (4)-6	1-Aug-25	Day time	2	1,648				
		2566510 (4)-7	1-Aug-25	Day time	3	2,219				
		2566510 (4)-8	1-Aug-25	Day time	4	1,236				
		2566510 (4)-9	1-Aug-25	Day time	5	1,148				
		2566510 (4)-10	1-Aug-25	Day time	6	1,505				
		2566510 (4)-11	1-Aug-25	Day time	7	2,183				
		2566510 (4)-12	1-Aug-25	Day time	8	1,013				
		2566510 (4)-13	1-Aug-25	Day time	9	659				
		2566510 (4)-14	1-Aug-25	Day time	10	529				
		2566510 (4)-15	1-Aug-25	Day time	11	2,531				
		2566510 (4)-16	1-Aug-25	Day time	12	2,189				
		2566510 (4)-17	1-Aug-25	Day time	13	2,113				
		2566510 (4)-18	1-Aug-25	Day time	14	2,127				
		2566510 (4)-19	1-Aug-25	Day time	15	1,464				
		2566510 (4)-20	1-Aug-25	Day time	16	1,708				
		2566510 (4)-21	1-Aug-25	Day time	17	2,219				
		2566510 (4)-22	1-Aug-25	Day time	18	2,431				
		2566510 (4)-23	1-Aug-25	Night time	1	481	424	100	200	Pass
		2566510 (4)-24	1-Aug-25	Night time	2	416				
		2566510 (4)-25	1-Aug-25	Night time	3	637				
		2566510 (4)-26	1-Aug-25	Night time	4	401				
		2566510 (4)-27	1-Aug-25	Night time	5	381				
		2566510 (4)-28	1-Aug-25	Night time	6	387				
		2566510 (4)-29	1-Aug-25	Night time	7	310				
		2566510 (4)-30	1-Aug-25	Night time	8	401				
		2566510 (4)-31	1-Aug-25	Night time	9	319				
		2566510 (4)-32	1-Aug-25	Night time	10	410				
		2566510 (4)-33	1-Aug-25	Night time	11	677				
		2566510 (4)-34	1-Aug-25	Night time	12	543				
		2566510 (4)-35	1-Aug-25	Night time	13	281				
		2566510 (4)-36	1-Aug-25	Night time	14	458				
		2566510 (4)-37	1-Aug-25	Night time	15	411				
		2566510 (4)-38	1-Aug-25	Night time	16	366				

Technical Management

Supot S.
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225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140
P/O :
Project Name : Monitoring EIA
Project Location: GTS4

Lot ID: 2566510 (4)

Date Received : Aug 03, 2025
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Report Number: 2566510 (4)-1 C1

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GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
2	Area : Electrical Building : ชั้น 2 : Electrical Room	2566510 (4)-39	1-Aug-25	Night time	17	360				
		2566510 (4)-40	1-Aug-25	Night time	18	316				
3	Area : Electrical Building : ชั้น 1 : ทางเดินบันได	2566510 (4)-41	1-Aug-25	Day time	1	12,180	9365	50	100	Pass
		2566510 (4)-42	1-Aug-25	Day time	2	6,550				
		2566510 (4)-43	1-Aug-25	Night time	1	132	124	50	100	Pass
		2566510 (4)-44	1-Aug-25	Night time	2	116				
4	Area : Electrical Building : ชั้น 2 : ทางเดินบันได	2566510 (4)-45	1-Aug-25	Day time	1	209	167	50	100	Pass
		2566510 (4)-46	1-Aug-25	Day time	2	125				
		2566510 (4)-47	1-Aug-25	Night time	1	227	204	50	100	Pass
		2566510 (4)-48	1-Aug-25	Night time	2	180				

Measurement by : Nattakarn Vonginyoo

Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

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Lot ID: 2566510 (5)
Date Received : Aug 03, 2025
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Report Number: 2566510 (5)-1 C1

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GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Spot : Electrical Building : ชั้น 3 : Switchgear	2566510 (5)-1	1-Aug-25	Day time	1	673	-	300-400	-	Pass
		2566510 (5)-2	1-Aug-25	Night time	1	469	-	300-400	-	Pass
2	Area : Electrical Building : ชั้น 3 : ทางเดินบันได	2566510 (5)-3	1-Aug-25	Day time	1	127	162	50	100	Pass
		2566510 (5)-4	1-Aug-25	Day time	2	197				
		2566510 (5)-5	1-Aug-25	Night time	1	205	166	50	100	Pass
		2566510 (5)-6	1-Aug-25	Night time	2	128				

Measurement by : Nattakarn Vonginyoo

Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

Technical Management

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225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140
P/O :
Project Name : Monitoring EIA
Project Location: GTS4

Lot ID: 2566510 (6)
Date Received : Aug 03, 2025
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Report Number: 2566510 (6)-1 C1

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GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : Switchyard Control Building Plan : GTS3 : Battery Room	2566510 (6)-1	1-Aug-25	Day time	1	251	250	100	200	Pass
		2566510 (6)-2	1-Aug-25	Day time	2	249				
		2566510 (6)-3	1-Aug-25	Night time	1	261	250	100	200	Pass
		2566510 (6)-4	1-Aug-25	Night time	2	240				
2	Area : Switchyard Control Building Plan : GTS3 : Substation GTS3	2566510 (6)-5	1-Aug-25	Day time	1	784	780	100	200	Pass
		2566510 (6)-6	1-Aug-25	Day time	2	620				
		2566510 (6)-7	1-Aug-25	Day time	3	898				
		2566510 (6)-8	1-Aug-25	Day time	4	816				
		2566510 (6)-9	1-Aug-25	Night time	1	529	579	100	200	Pass
		2566510 (6)-10	1-Aug-25	Night time	2	512				
		2566510 (6)-11	1-Aug-25	Night time	3	677				
		2566510 (6)-12	1-Aug-25	Night time	4	599				
		2566510 (6)-13	1-Aug-25	Day time	1	302	-	300-400	-	Pass
		2566510 (6)-14	1-Aug-25	Night time	1	307	-	300-400	-	Pass
4	Area : Switchyard Control Building Plan : GTS3 : Switchyard Control Room	2566510 (6)-15	1-Aug-25	Day time	1	1,104	825	100	200	Pass
		2566510 (6)-16	1-Aug-25	Day time	2	911				
		2566510 (6)-17	1-Aug-25	Day time	3	538				
		2566510 (6)-18	1-Aug-25	Day time	4	747				
		2566510 (6)-19	1-Aug-25	Night time	1	635	564	100	200	Pass
		2566510 (6)-20	1-Aug-25	Night time	2	542				
		2566510 (6)-21	1-Aug-25	Night time	3	514				
		2566510 (6)-22	1-Aug-25	Night time	4	566				
		2566510 (6)-23	1-Aug-25	Day time	1	418	442	100	200	Pass
		2566510 (6)-24	1-Aug-25	Day time	2	466				
5	Area : Switchyard Control Building Plan : GTS4 : Battery Room	2566510 (6)-25	1-Aug-25	Night time	1	433	424	100	200	Pass
		2566510 (6)-26	1-Aug-25	Night time	2	414				
		2566510 (6)-27	1-Aug-25	Day time	1	813	771	100	200	Pass
		2566510 (6)-28	1-Aug-25	Day time	2	810				
		2566510 (6)-29	1-Aug-25	Day time	3	725				
		2566510 (6)-30	1-Aug-25	Day time	4	737				
		2566510 (6)-31	1-Aug-25	Night time	1	574	682	100	200	Pass
		2566510 (6)-32	1-Aug-25	Night time	2	828				
		2566510 (6)-33	1-Aug-25	Night time	3	585				
		2566510 (6)-34	1-Aug-25	Night time	4	743				

Technical Management

Supot S.
Supot Salamteh
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Wichan Choonharat
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225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140
P/O :
Project Name : Monitoring EIA
Project Location : GTS4

Lot ID: 2566510 (6)

Date Received : Aug 03, 2025
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Report Number: 2566510 (6)-1 C1

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GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
7	Spot : Switchyard Control Building Plan : GTS4 : Switchgear	2566510 (6)-35	1-Aug-25	Day time	1	491	-	300-400	-	Pass
		2566510 (6)-36	1-Aug-25	Night time	1	468	-	300-400	-	Pass
8	Area : Switchyard Control Building Plan : GTS4 : Switchyard Control Room	2566510 (6)-37	1-Aug-25	Day time	1	673	695	100	200	Pass
		2566510 (6)-38	1-Aug-25	Day time	2	632				
		2566510 (6)-39	1-Aug-25	Day time	3	776				
		2566510 (6)-40	1-Aug-25	Day time	4	698				
		2566510 (6)-41	1-Aug-25	Night time	1	554	614	100	200	Pass
		2566510 (6)-42	1-Aug-25	Night time	2	600				
		2566510 (6)-43	1-Aug-25	Night time	3	795				
		2566510 (6)-44	1-Aug-25	Night time	4	506				

Measurement by : Nattakarn Vonginyoo

Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

Technical Management

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225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140
P/O :
Project Name : Monitoring EIA
Project Location : GTS4

Lot ID: 2566510 (7)

Date Received : Aug 03, 2025
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Report Number: 2566510 (7)-1 C1

Page 1 of 1

GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Spot : Water Treatment Control Building : Fire Pump	2566510 (7)-1	1-Aug-25	Day time	1	4,800	-	300-400	-	Pass
		2566510 (7)-2	1-Aug-25	Day time	2	3,990	-	600	-	
		2566510 (7)-3	1-Aug-25	Day time	3	5,480	-	300	-	
		2566510 (7)-4	1-Aug-25	Night time	1	323	-	300-400	-	Pass
2	Spot : Water Treatment Control Building : Laboratory 1 (Fume Hood)	2566510 (7)-5	1-Aug-25	Day time	1	414	-	400-500	-	Pass
		2566510 (7)-6	1-Aug-25	Night time	1	451	-	400-500	-	Pass
3	Spot : Water Treatment Control Building : Laboratory 2 (Water Table)	2566510 (7)-7	1-Aug-25	Day time	1	622	-	400-500	-	Pass
		2566510 (7)-8	1-Aug-25	Night time	1	485	-	400-500	-	Pass
4	Spot : Water Treatment Control Building : Office Laboratory	2566510 (7)-9	1-Aug-25	Day time	1	566	-	400-500	-	Pass
		2566510 (7)-10	1-Aug-25	Night time	1	587	-	400-500	-	Pass
5	Spot : Water Treatment Control Building : Water Treatment	2566510 (7)-11	1-Aug-25	Day time	1	689	-	300-400	-	Pass
		2566510 (7)-12	1-Aug-25	Night time	1	648	-	300-400	-	Pass

Measurement by : Nattakarn Vonginyoo

Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

Technical Management

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225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location: GTS4

Lot ID: 2566510 (8)

Date Received : Aug 03, 2025

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Report Number: 2566510 (8)-1 C1

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GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Spot : Workshop and Warehouse : 2nd Floor : เครื่องกำเนิดเสียง	2566510 (8)-1	1-Aug-25	Day time	1	410	-	300-400	-	Pass
4	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ ME 1	2566510 (8)-2	1-Aug-25	Day time	1	416	-	400-500	-	Pass
5	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ ME 2	2566510 (8)-3	1-Aug-25	Day time	1	406	-	400-500	-	Pass
6	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ ME 3	2566510 (8)-4	1-Aug-25	Day time	1	417	-	400-500	-	Pass
7	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ ME 4	2566510 (8)-5	1-Aug-25	Day time	1	421	-	400-500	-	Pass
8	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ MI 1	2566510 (8)-6	1-Aug-25	Day time	1	406	-	400-500	-	Pass
9	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ MI 2	2566510 (8)-7	1-Aug-25	Day time	1	405	-	400-500	-	Pass
10	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ MI 3	2566510 (8)-8	1-Aug-25	Day time	1	413	-	400-500	-	Pass
11	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ MI 4	2566510 (8)-9	1-Aug-25	Day time	1	402	-	400-500	-	Pass
12	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ MM 1	2566510 (8)-10	1-Aug-25	Day time	1	402	-	400-500	-	Pass
13	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ MM 2	2566510 (8)-11	1-Aug-25	Day time	1	442	-	400-500	-	Pass
14	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ MM 3	2566510 (8)-12	1-Aug-25	Day time	1	429	-	400-500	-	Pass
15	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ MM 4	2566510 (8)-13	1-Aug-25	Day time	1	525	-	400-500	-	Pass
16	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ MM Manager	2566510 (8)-14	1-Aug-25	Day time	1	774	-	400-500	-	Pass
17	Area : Workshop and Warehouse : 2nd Floor : ทางเดิน ชั้น 2	2566510 (8)-15	1-Aug-25	Day time	1	314	318	50	100	Pass
		2566510 (8)-16	1-Aug-25	Day time	2	446				
		2566510 (8)-17	1-Aug-25	Day time	3	194				
18	Area : Workshop and Warehouse : 2nd Floor : ทางลงบันได ชั้น 2	2566510 (8)-18	1-Aug-25	Day time	1	130	115	50	100	Pass
		2566510 (8)-19	1-Aug-25	Day time	2	100				

Technical Management

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P/O :

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Project Location: GTS4

Lot ID: 2566510 (8)

Date Received : Aug 03, 2025

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GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
19	Area : Workshop and Warehouse : 2nd Floor : บันได ชั้น 2	2566510 (8)-20	1-Aug-25	Day time	1	158	134	50	100	Pass
		2566510 (8)-21	1-Aug-25	Day time	2	109				
20	Area : Workshop and Warehouse : 2nd Floor : ฟองเบียร์เอกสาร	2566510 (8)-22	1-Aug-25	Day time	1	458	412	100	200	Pass
		2566510 (8)-23	1-Aug-25	Day time	2	366				
21	Area : Workshop and Warehouse : 2nd Floor : ฟองน้ำขาย	2566510 (8)-24	1-Aug-25	Day time	1	401	467	50	100	Pass
		2566510 (8)-25	1-Aug-25	Day time	2	533				
22	Area : Workshop and Warehouse : 2nd Floor : ฟองประชุม	2566510 (8)-26	1-Aug-25	Day time	1	2,087	874	150	300	Pass
		2566510 (8)-27	1-Aug-25	Day time	2	550				
		2566510 (8)-28	1-Aug-25	Day time	3	733				
		2566510 (8)-29	1-Aug-25	Day time	4	545				
		2566510 (8)-30	1-Aug-25	Day time	5	617				
		2566510 (8)-31	1-Aug-25	Day time	6	715				
23	Area : Workshop and Warehouse : 2nd Floor : ฟองพักผ่อน W/H	2566510 (8)-32	1-Aug-25	Day time	1	564	636	25	50	Pass
		2566510 (8)-33	1-Aug-25	Day time	2	707				
24	Area : Workshop and Warehouse : 2nd Floor : Store	2566510 (8)-34	1-Aug-25	Day time	1	281	607	100	200	Pass
		2566510 (8)-35	1-Aug-25	Day time	2	375				
		2566510 (8)-36	1-Aug-25	Day time	3	475				
		2566510 (8)-37	1-Aug-25	Day time	4	182				
		2566510 (8)-38	1-Aug-25	Day time	5	370				
		2566510 (8)-39	1-Aug-25	Day time	6	839				
		2566510 (8)-40	1-Aug-25	Day time	7	620				
		2566510 (8)-41	1-Aug-25	Day time	8	888				
		2566510 (8)-42	1-Aug-25	Day time	9	495				
		2566510 (8)-43	1-Aug-25	Day time	10	783				
		2566510 (8)-44	1-Aug-25	Day time	11	911				
		2566510 (8)-45	1-Aug-25	Day time	12	566				
		2566510 (8)-46	1-Aug-25	Day time	13	330				
		2566510 (8)-47	1-Aug-25	Day time	14	899				
		2566510 (8)-48	1-Aug-25	Day time	15	831				
		2566510 (8)-49	1-Aug-25	Day time	16	864				

Measurement by : Nattakarn Vonginyoo

Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

Technical Management

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Section Head

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140
P/O :
Project Name : Monitoring EIA
Project Location: GTS4

Lot ID: 2566510 (9)

Date Received : Aug 03, 2025
Date Reported : Aug 07, 2025
Report Number: 2566510 (9)-1 C1

Page 1 of 2

GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : Workshop and Warehouse : Ground Floor : Store ชั้น 1	2566510 (9)-1	1-Aug-25	Day time	1	512	679	100	200	Pass
		2566510 (9)-2	1-Aug-25	Day time	2	756				
		2566510 (9)-3	1-Aug-25	Day time	3	850				
		2566510 (9)-4	1-Aug-25	Day time	4	477				
		2566510 (9)-5	1-Aug-25	Day time	5	410				
		2566510 (9)-6	1-Aug-25	Day time	6	527				
		2566510 (9)-7	1-Aug-25	Day time	7	714				
		2566510 (9)-8	1-Aug-25	Day time	8	502				
		2566510 (9)-9	1-Aug-25	Day time	9	900				
		2566510 (9)-10	1-Aug-25	Day time	10	895				
		2566510 (9)-11	1-Aug-25	Day time	11	909				
		2566510 (9)-12	1-Aug-25	Day time	12	993				
		2566510 (9)-13	1-Aug-25	Day time	13	755				
		2566510 (9)-14	1-Aug-25	Day time	14	462				
		2566510 (9)-15	1-Aug-25	Day time	15	799				
		2566510 (9)-16	1-Aug-25	Day time	16	401				
2	Area : Workshop and Warehouse : Ground Floor : ทางเข้า W/H	2566510 (9)-17	1-Aug-25	Day time	1	347	230	50	100	Pass
		2566510 (9)-18	1-Aug-25	Day time	2	113				
3	Area : Workshop and Warehouse : Ground Floor : ทางเดิน W/H ใหญ่	2566510 (9)-19	1-Aug-25	Day time	1	1,778	1795	50	100	Pass
		2566510 (9)-20	1-Aug-25	Day time	2	1,812				
4	Area : Workshop and Warehouse : Ground Floor : ทางเดิน ชั้น 1	2566510 (9)-21	1-Aug-25	Day time	1	319	563	50	100	Pass
		2566510 (9)-22	1-Aug-25	Day time	2	839				
		2566510 (9)-23	1-Aug-25	Day time	3	514				
		2566510 (9)-24	1-Aug-25	Day time	4	947				
		2566510 (9)-25	1-Aug-25	Day time	5	331				
		2566510 (9)-26	1-Aug-25	Day time	6	428				
5	Area : Workshop and Warehouse : Ground Floor : ห้อง Tool Room (AC 1-3)	2566510 (9)-27	1-Aug-25	Day time	1	789	755	100	200	Pass
		2566510 (9)-28	1-Aug-25	Day time	2	721				
		2566510 (9)-29	1-Aug-25	Day time	3	755				
6	Spot : Workshop and Warehouse : Ground Floor : ห้อง W/H Office 1 TS4	2566510 (9)-30	1-Aug-25	Day time	1	455	-	400-500	-	Pass
7	Spot : Workshop and Warehouse : Ground Floor : ห้อง W/H Office 2 TS3	2566510 (9)-31	1-Aug-25	Day time	1	472	-	400-500	-	Pass

Technical Management

Supot S.
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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140
P/O :
Project Name : Monitoring EIA
Project Location: GTS4

Lot ID: 2566510 (9)

Date Received : Aug 03, 2025
Date Reported : Aug 07, 2025
Report Number: 2566510 (9)-1 C1

Page 2 of 2

GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
8	Spot : Workshop and Warehouse : Ground Floor : ห้อง Calibration ห้องปฏิบัติงาน การเครื่องมือวัด	2566510 (9)-32	1-Aug-25	Day time	1	585	-	400-500	-	Pass
9	Area : Workshop and Warehouse : Ground Floor : ห้องปฏิบัติงานเครื่องกล-ไฟฟ้า	2566510 (9)-33	1-Aug-25	Day time	1	993	726	150	300	Pass
		2566510 (9)-34	1-Aug-25	Day time	2	763				
		2566510 (9)-35	1-Aug-25	Day time	3	570				
		2566510 (9)-36	1-Aug-25	Day time	4	752				
		2566510 (9)-37	1-Aug-25	Day time	5	620				
		2566510 (9)-38	1-Aug-25	Day time	6	904				
		2566510 (9)-39	1-Aug-25	Day time	7	855				
		2566510 (9)-40	1-Aug-25	Day time	8	613				
		2566510 (9)-41	1-Aug-25	Day time	9	461				

Measurement by : Nattakarn Vonginyoo

Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

Technical Management

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location: GTS4

Lot ID: 25100100 (1)

Date Received : Nov 12, 2025

Date Reported : Nov 19, 2025

Report Number: 25100100 (1)-1 C1

Page 1 of 2

GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Spot : Administration Building : 1st Floor : ห้องพนักงานเอกสาร	25100100 (1)-1	10-Nov-25	Day time	1	757	-	300-400	-	Pass
2	Spot : Administration Building : 1st Floor : ห้อง Admin. 1	25100100 (1)-2	10-Nov-25	Day time	1	470	-	400-500	-	Pass
3	Spot : Administration Building : 1st Floor : ห้อง Admin. 2	25100100 (1)-3	10-Nov-25	Day time	1	455	-	400-500	-	Pass
4	Spot : Administration Building : 1st Floor : ห้อง Operation Manager	25100100 (1)-4	10-Nov-25	Day time	1	522	-	400-500	-	Pass
5	Spot : Administration Building : 1st Floor : ห้อง EHS	25100100 (1)-5	10-Nov-25	Day time	1	840	-	400-500	-	Pass
6	Spot : Administration Building : 1st Floor : ห้อง EHS Manager	25100100 (1)-6	10-Nov-25	Day time	1	955	-	400-500	-	Pass
7	Spot : Administration Building : 1st Floor : ห้อง Admin. Manager	25100100 (1)-7	10-Nov-25	Day time	1	534	-	400-500	-	Pass
8	Spot : Administration Building : 1st Floor : ห้อง Plant Manager	25100100 (1)-8	10-Nov-25	Day time	1	464	-	400-500	-	Pass
9	Spot : Administration Building : 1st Floor : ห้อง IT	25100100 (1)-9	10-Nov-25	Day time	1	491	-	400-500	-	Pass
10	Spot : Administration Building : 1st Floor : ห้องจัดซื้อ 1	25100100 (1)-10	10-Nov-25	Day time	1	434	-	400-500	-	Pass
11	Spot : Administration Building : 1st Floor : ห้องจัดซื้อ 2	25100100 (1)-11	10-Nov-25	Day time	1	570	-	400-500	-	Pass
12	Area : Administration Building : 1st Floor : ทางเดิน	25100100 (1)-12	10-Nov-25	Day time	1	830	619	50	100	Pass
		25100100 (1)-13	10-Nov-25	Day time	2	1,150				
		25100100 (1)-14	10-Nov-25	Day time	3	300				
		25100100 (1)-15	10-Nov-25	Day time	4	418				
		25100100 (1)-16	10-Nov-25	Day time	5	515				
		25100100 (1)-17	10-Nov-25	Day time	6	503				
13	Area : Administration Building : 1st Floor : ห้องเก็บเอกสาร	25100100 (1)-18	10-Nov-25	Day time	1	511	664	100	200	Pass
		25100100 (1)-19	10-Nov-25	Day time	2	817				

Technical Management

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location: GTS4

Lot ID: 25100100 (1)

Date Received : Nov 12, 2025

Date Reported : Nov 19, 2025

Report Number: 25100100 (1)-1 C1

Page 2 of 2

GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
15	Area : Administration Building : 1st Floor : ห้องประชุมใหญ่	25100100 (1)-20	10-Nov-25	Day time	1	810	490	150	300	Pass
		25100100 (1)-21	10-Nov-25	Day time	2	544				
		25100100 (1)-22	10-Nov-25	Day time	3	540				
		25100100 (1)-23	10-Nov-25	Day time	4	510				
		25100100 (1)-24	10-Nov-25	Day time	5	499				
		25100100 (1)-25	10-Nov-25	Day time	6	277				
		25100100 (1)-26	10-Nov-25	Day time	7	352				
		25100100 (1)-27	10-Nov-25	Day time	8	846				
		25100100 (1)-28	10-Nov-25	Day time	9	552				
		25100100 (1)-29	10-Nov-25	Day time	10	319				
		25100100 (1)-30	10-Nov-25	Day time	11	316				
		25100100 (1)-31	10-Nov-25	Day time	12	318				
16	Area : Administration Building : 1st Floor : ห้องรับแขก	25100100 (1)-32	10-Nov-25	Day time	1	506	612	50	100	Pass
		25100100 (1)-33	10-Nov-25	Day time	2	463				
		25100100 (1)-34	10-Nov-25	Day time	3	828				
		25100100 (1)-35	10-Nov-25	Day time	4	653				
17	Area : Administration Building : 1st Floor : ห้องประชุมเล็ก	25100100 (1)-36	10-Nov-25	Day time	1	549	613	150	300	Pass
		25100100 (1)-37	10-Nov-25	Day time	2	620				
		25100100 (1)-38	10-Nov-25	Day time	3	669				
		25100100 (1)-39	10-Nov-25	Day time	4	613				

Measurement by : Nattakarn Vonginyoo

Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

Technical Management

Supot S.

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140
P/O :
Project Name : Monitoring EIA
Project Location: GTS4

Lot ID: 25100100 (2)

Date Received : Nov 12, 2025
Date Reported : Nov 19, 2025
Report Number: 25100100 (2)-1 C1

Page 1 of 2

GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : CCR : Control Building : 1st Floor : Switchgear Room	25100100 (2)-1	10-Nov-25	Day time	1	718	413	100	200	Pass
		25100100 (2)-2	10-Nov-25	Day time	2	416				
		25100100 (2)-3	10-Nov-25	Day time	3	481				
		25100100 (2)-4	10-Nov-25	Day time	4	512				
		25100100 (2)-5	10-Nov-25	Day time	5	383				
		25100100 (2)-6	10-Nov-25	Day time	6	301				
		25100100 (2)-7	10-Nov-25	Day time	7	713				
		25100100 (2)-8	10-Nov-25	Day time	8	625				
		25100100 (2)-9	10-Nov-25	Day time	9	230				
		25100100 (2)-10	10-Nov-25	Day time	10	245				
		25100100 (2)-11	10-Nov-25	Day time	11	490				
		25100100 (2)-12	10-Nov-25	Day time	12	272				
		25100100 (2)-13	10-Nov-25	Day time	13	553				
		25100100 (2)-14	10-Nov-25	Day time	14	207				
		25100100 (2)-15	10-Nov-25	Day time	15	465				
		25100100 (2)-16	10-Nov-25	Day time	16	540				
		25100100 (2)-17	10-Nov-25	Day time	17	339				
		25100100 (2)-18	10-Nov-25	Day time	18	280				
		25100100 (2)-19	10-Nov-25	Night time	1	929	528	100	200	Pass
		25100100 (2)-20	10-Nov-25	Night time	2	483				
		25100100 (2)-21	10-Nov-25	Night time	3	641				
		25100100 (2)-22	10-Nov-25	Night time	4	634				
		25100100 (2)-23	10-Nov-25	Night time	5	566				
		25100100 (2)-24	10-Nov-25	Night time	6	245				
		25100100 (2)-25	10-Nov-25	Night time	7	762				
		25100100 (2)-26	10-Nov-25	Night time	8	788				
		25100100 (2)-27	10-Nov-25	Night time	9	603				
		25100100 (2)-28	10-Nov-25	Night time	10	385				
		25100100 (2)-29	10-Nov-25	Night time	11	411				
		25100100 (2)-30	10-Nov-25	Night time	12	390				
		25100100 (2)-31	10-Nov-25	Night time	13	585				
		25100100 (2)-32	10-Nov-25	Night time	14	362				
		25100100 (2)-33	10-Nov-25	Night time	15	566				
		25100100 (2)-34	10-Nov-25	Night time	16	550				
		25100100 (2)-35	10-Nov-25	Night time	17	422				
		25100100 (2)-36	10-Nov-25	Night time	18	667				

Technical Management

Supot S.
Supot Salamteh
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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140
P/O :
Project Name : Monitoring EIA
Project Location: GTS4

Lot ID: 25100100 (2)

Date Received : Nov 12, 2025
Date Reported : Nov 19, 2025
Report Number: 25100100 (2)-1 C1

Page 2 of 2

GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
2	Area : CCR : Control Building : 1st Floor : ทางเดินบันได	25100100 (2)-37	10-Nov-25	Day time	1	591	480	50	100	Pass
		25100100 (2)-38	10-Nov-25	Day time	2	370				
		25100100 (2)-39	10-Nov-25	Night time	1	103			100	Pass
		25100100 (2)-40	10-Nov-25	Night time	2	114				

Measurement by : Nattakarn Vonginyoo

Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

Technical Management

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225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140
P/O :
Project Name : Monitoring EIA
Project Location: GTS4

Lot ID: 25100100 (3)

Date Received : Nov 12, 2025
Date Reported : Nov 19, 2025
Report Number: 25100100 (3)-1 C1

Page 1 of 2

GTS4											
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment	
						Spot	Average	Spot/Min	Average		
1	Spot : CCR : Control Building : 3rd Floor : Control GTS3 No.1	25100100 (3)-1	10-Nov-25	Day time	1	470	-	400-500	-	Pass	
		25100100 (3)-2	10-Nov-25	Night time	1	408	-	400-500	-	Pass	
2	Spot : CCR : Control Building : 3rd Floor : Control GTS3 No.2	25100100 (3)-3	10-Nov-25	Day time	1	433	-	400-500	-	Pass	
3	Spot : CCR : Control Building : 3rd Floor : Control GTS4 No.1	25100100 (3)-5	10-Nov-25	Day time	1	613	-	400-500	-	Pass	
		25100100 (3)-6	10-Nov-25	Night time	1	465	-	400-500	-	Pass	
4	Spot : CCR : Control Building : 3rd Floor : Control GTS4 No.2	25100100 (3)-7	10-Nov-25	Day time	1	466	-	400-500	-	Pass	
		25100100 (3)-8	10-Nov-25	Night time	1	425	-	400-500	-	Pass	
5	Spot : CCR : Control Building : 3rd Floor : DCS	25100100 (3)-9	10-Nov-25	Day time	1	672	-	400-500	-	Pass	
		25100100 (3)-10	10-Nov-25	Night time	1	691	-	400-500	-	Pass	
6	Spot : CCR : Control Building : 3rd Floor : เครื่องถ่ายเอกสาร	25100100 (3)-11	10-Nov-25	Day time	1	340	-	300-400	-	Pass	
		25100100 (3)-12	10-Nov-25	Night time	1	314	-	300-400	-	Pass	
7	Spot : CCR : Control Building : 3rd Floor : เครื่องส่งโทรโข่งและเครื่องรับโทรโข่ง	25100100 (3)-13	10-Nov-25	Day time	1	600	-	300-400	-	Pass	
		25100100 (3)-14	10-Nov-25	Night time	1	547	-	300-400	-	Pass	
8	Spot : CCR : Control Building : 3rd Floor : โต๊ะ Daytime Operation	25100100 (3)-15	10-Nov-25	Day time	1	936	-	400-500	-	Pass	
9	Spot : CCR : Control Building : 3rd Floor : โต๊ะ Operation Manager	25100100 (3)-16	10-Nov-25	Day time	1	559	-	400-500	-	Pass	
10	Spot : CCR : Control Building : 3rd Floor : โต๊ะ Permit	25100100 (3)-17	10-Nov-25	Day time	1	627	-	400-500	-	Pass	
		25100100 (3)-18	10-Nov-25	Night time	1	494	-	400-500	-	Pass	
11	Spot : CCR : Control Building : 3rd Floor : โต๊ะ Shift Leader Daytime	25100100 (3)-19	10-Nov-25	Day time	1	450	-	400-500	-	Pass	
		25100100 (3)-20	10-Nov-25	Night time	1	500	-	400-500	-	Pass	
12	Spot : CCR : Control Building : 3rd Floor : โต๊ะ Shift Leader GTS3	25100100 (3)-21	10-Nov-25	Day time	1	532	-	400-500	-	Pass	
		25100100 (3)-22	10-Nov-25	Night time	1	517	-	400-500	-	Pass	
13	Spot : CCR : Control Building : 3rd Floor : โต๊ะ Shift Leader GTS4	25100100 (3)-23	10-Nov-25	Day time	1	564	-	400-500	-	Pass	
		25100100 (3)-24	10-Nov-25	Night time	1	500	-	400-500	-	Pass	

Technical Management

Supot S.
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Section Head

Approved by

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Assistant Manager

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140
P/O :
Project Name : Monitoring EIA
Project Location: GTS4

Lot ID: 25100100 (3)

Date Received : Nov 12, 2025
Date Reported : Nov 19, 2025
Report Number: 25100100 (3)-1 C1

Page 2 of 2

GTS4											
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment	
						Spot	Average	Spot/Min	Average		
14	Area : CCR : Control Building : 3rd Floor : ทางเดิน	25100100 (3)-25	10-Nov-25	Day time	1	862	482	50	100	Pass	
		25100100 (3)-26	10-Nov-25	Day time	2	321					
		25100100 (3)-27	10-Nov-25	Day time	3	347					
		25100100 (3)-28	10-Nov-25	Day time	4	568					
		25100100 (3)-29	10-Nov-25	Day time	5	310					
		25100100 (3)-30	10-Nov-25	Night time	1	470	617	50	100	Pass	
		25100100 (3)-31	10-Nov-25	Night time	2	700					
		25100100 (3)-32	10-Nov-25	Night time	3	631					
		25100100 (3)-33	10-Nov-25	Night time	4	670					
		25100100 (3)-34	10-Nov-25	Night time	5	615					
15	Area : CCR : Control Building : 3rd Floor : ทางเดินบันได	25100100 (3)-35	10-Nov-25	Day time	1	399	502	50	100	Pass	
		25100100 (3)-36	10-Nov-25	Day time	2	606					
		25100100 (3)-37	10-Nov-25	Night time	1	128	134	50	100	Pass	
		25100100 (3)-38	10-Nov-25	Night time	2	140					

Measurement by : Nattakarn Vonginyoo

Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

Technical Management

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225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140
P/O :
Project Name : Monitoring EIA
Project Location: GTS4

Lot ID: 25100100 (4)

Date Received : Nov 12, 2025
Date Reported : Nov 19, 2025
Report Number: 25100100 (4)-1 C1

Page 1 of 2

GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : Electrical Building : ชั้น 2 : Battery Room	25100100 (4)-1	10-Nov-25	Day time	1	590	401	100	200	Pass
		25100100 (4)-2	10-Nov-25	Day time	2	212				
		25100100 (4)-3	10-Nov-25	Night time	1	403	356	100	200	Pass
		25100100 (4)-4	10-Nov-25	Night time	2	309				
2	Area : Electrical Building : ชั้น 2 : Electrical Room	25100100 (4)-5	10-Nov-25	Day time	1	883	844	100	200	Pass
		25100100 (4)-6	10-Nov-25	Day time	2	896				
		25100100 (4)-7	10-Nov-25	Day time	3	544				
		25100100 (4)-8	10-Nov-25	Day time	4	614				
		25100100 (4)-9	10-Nov-25	Day time	5	693				
		25100100 (4)-10	10-Nov-25	Day time	6	588				
		25100100 (4)-11	10-Nov-25	Day time	7	661				
		25100100 (4)-12	10-Nov-25	Day time	8	839				
		25100100 (4)-13	10-Nov-25	Day time	9	633				
		25100100 (4)-14	10-Nov-25	Day time	10	621				
		25100100 (4)-15	10-Nov-25	Day time	11	928				
		25100100 (4)-16	10-Nov-25	Day time	12	482				
		25100100 (4)-17	10-Nov-25	Day time	13	1,197				
		25100100 (4)-18	10-Nov-25	Day time	14	785				
		25100100 (4)-19	10-Nov-25	Day time	15	921				
		25100100 (4)-20	10-Nov-25	Day time	16	828				
		25100100 (4)-21	10-Nov-25	Day time	17	990				
		25100100 (4)-22	10-Nov-25	Day time	18	1,282				
		25100100 (4)-23	10-Nov-25	Night time	1	362	432	100	200	Pass
		25100100 (4)-24	10-Nov-25	Night time	2	608				
		25100100 (4)-25	10-Nov-25	Night time	3	206				
		25100100 (4)-26	10-Nov-25	Night time	4	560				
		25100100 (4)-27	10-Nov-25	Night time	5	308				
		25100100 (4)-28	10-Nov-25	Night time	6	505				
		25100100 (4)-29	10-Nov-25	Night time	7	222				
		25100100 (4)-30	10-Nov-25	Night time	8	647				
		25100100 (4)-31	10-Nov-25	Night time	9	654				
		25100100 (4)-32	10-Nov-25	Night time	10	393				
		25100100 (4)-33	10-Nov-25	Night time	11	430				
		25100100 (4)-34	10-Nov-25	Night time	12	536				
		25100100 (4)-35	10-Nov-25	Night time	13	270				
		25100100 (4)-36	10-Nov-25	Night time	14	230				
		25100100 (4)-37	10-Nov-25	Night time	15	651				
		25100100 (4)-38	10-Nov-25	Night time	16	646				

Technical Management

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Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140
P/O :
Project Name : Monitoring EIA
Project Location: GTS4

Lot ID: 25100100 (4)

Date Received : Nov 12, 2025
Date Reported : Nov 19, 2025
Report Number: 25100100 (4)-1 C1

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GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
2	Area : Electrical Building : ชั้น 2 : Electrical Room	25100100 (4)-39	10-Nov-25	Night time	17	376				
		25100100 (4)-40	10-Nov-25	Night time	18	315				
3	Area : Electrical Building : ชั้น 1 : ทางเดินบันได	25100100 (4)-41	10-Nov-25	Day time	1	4,440	9702	50	100	Pass
		25100100 (4)-42	10-Nov-25	Day time	2	14,963				
		25100100 (4)-43	10-Nov-25	Night time	1	100	168	50	100	Pass
		25100100 (4)-44	10-Nov-25	Night time	2	235				
4	Area : Electrical Building : ชั้น 2 : ทางเดินบันได	25100100 (4)-45	10-Nov-25	Day time	1	120	126	50	100	Pass
		25100100 (4)-46	10-Nov-25	Day time	2	131				
		25100100 (4)-47	10-Nov-25	Night time	1	152	119	50	100	Pass
		25100100 (4)-48	10-Nov-25	Night time	2	86				

Measurement by : Nattakarn Vonginyoo

Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

Technical Management

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Project Name : Monitoring EIA
Project Location: GTS4

Lot ID: 25100100 (5)

Date Received : Nov 12, 2025
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Report Number: 25100100 (5)-1 C1

Page 1 of 1

GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Spot : Electrical Building : ชั้น 3 : Switchgear	25100100 (5)-1	10-Nov-25	Day time	1	831	-	300-400	-	Pass
		25100100 (5)-2	10-Nov-25	Night time	1	591	-	300-400	-	Pass
2	Area : Electrical Building : ชั้น 3 : ทางเดินบันได	25100100 (5)-3	10-Nov-25	Day time	1	299	280	50	100	Pass
		25100100 (5)-4	10-Nov-25	Day time	2	261				
		25100100 (5)-5	10-Nov-25	Night time	1	126	121	50	100	Pass
		25100100 (5)-6	10-Nov-25	Night time	2	116				

Measurement by : Nattakarn Vonginyoo

Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

Technical Management

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P/O :
Project Name : Monitoring EIA
Project Location: GTS4

Lot ID: 25100100 (6)

Date Received : Nov 12, 2025
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Report Number: 25100100 (6)-1 C1

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GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : Switchyard Control Building Plan : GTS3 : Battery Room	25100100 (6)-1	10-Nov-25	Day time	1	450	476	100	200	Pass
		25100100 (6)-2	10-Nov-25	Day time	2	501				
		25100100 (6)-3	10-Nov-25	Night time	1	409	424	100	200	Pass
		25100100 (6)-4	10-Nov-25	Night time	2	440				
2	Area : Switchyard Control Building Plan : GTS3 : Substation GTS3	25100100 (6)-5	10-Nov-25	Day time	1	525	692	100	200	Pass
		25100100 (6)-6	10-Nov-25	Day time	2	640				
		25100100 (6)-7	10-Nov-25	Day time	3	907				
		25100100 (6)-8	10-Nov-25	Day time	4	695				
		25100100 (6)-9	10-Nov-25	Night time	1	772	679	100	200	Pass
		25100100 (6)-10	10-Nov-25	Night time	2	728				
		25100100 (6)-11	10-Nov-25	Night time	3	550				
		25100100 (6)-12	10-Nov-25	Night time	4	666				
3	Spot : Switchyard Control Building Plan : GTS3 : Switchgear	25100100 (6)-13	10-Nov-25	Day time	1	433	-	300-400	-	Pass
		25100100 (6)-14	10-Nov-25	Night time	1	390	-	300-400	-	Pass
4	Area : Switchyard Control Building Plan : GTS3 : Switchyard Control Room	25100100 (6)-15	10-Nov-25	Day time	1	643	740	100	200	Pass
		25100100 (6)-16	10-Nov-25	Day time	2	614				
		25100100 (6)-17	10-Nov-25	Day time	3	861				
		25100100 (6)-18	10-Nov-25	Day time	4	843				
		25100100 (6)-19	10-Nov-25	Night time	1	577	675	100	200	Pass
		25100100 (6)-20	10-Nov-25	Night time	2	677				
		25100100 (6)-21	10-Nov-25	Night time	3	744				
		25100100 (6)-22	10-Nov-25	Night time	4	701				
5	Area : Switchyard Control Building Plan : GTS4 : Battery Room	25100100 (6)-23	10-Nov-25	Day time	1	312	318	100	200	Pass
		25100100 (6)-24	10-Nov-25	Day time	2	324				
		25100100 (6)-25	10-Nov-25	Night time	1	303	326	100	200	Pass
		25100100 (6)-26	10-Nov-25	Night time	2	348				
6	Area : Switchyard Control Building Plan : GTS4 : Substation GTS4	25100100 (6)-27	10-Nov-25	Day time	1	757	758	100	200	Pass
		25100100 (6)-28	10-Nov-25	Day time	2	862				
		25100100 (6)-29	10-Nov-25	Day time	3	555				
		25100100 (6)-30	10-Nov-25	Day time	4	859				
		25100100 (6)-31	10-Nov-25	Night time	1	763	745	100	200	Pass
		25100100 (6)-32	10-Nov-25	Night time	2	830				
		25100100 (6)-33	10-Nov-25	Night time	3	700				
		25100100 (6)-34	10-Nov-25	Night time	4	687				

Technical Management

Supot S.
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225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140
P/O :
Project Name : Monitoring EIA
Project Location : GTS4

Lot ID: 25100100 (6)

Date Received : Nov 12, 2025
Date Reported : Nov 19, 2025
Report Number: 25100100 (6)-1 C1

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GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
7	Spot : Switchyard Control Building Plan : GTS4 : Switchgear	25100100 (6)-35	10-Nov-25	Day time	1	375	-	300-400	-	Pass
		25100100 (6)-36	10-Nov-25	Night time	1	418	-	300-400	-	Pass
8	Area : Switchyard Control Building Plan : GTS4 : Switchyard Control Room	25100100 (6)-37	10-Nov-25	Day time	1	881	807	100	200	Pass
		25100100 (6)-38	10-Nov-25	Day time	2	858				
		25100100 (6)-39	10-Nov-25	Day time	3	635				
		25100100 (6)-40	10-Nov-25	Day time	4	855				
		25100100 (6)-41	10-Nov-25	Night time	1	728	705	100	200	Pass
		25100100 (6)-42	10-Nov-25	Night time	2	806				
		25100100 (6)-43	10-Nov-25	Night time	3	712				
		25100100 (6)-44	10-Nov-25	Night time	4	573				

Measurement by : Nattakarn Vonginyoo

Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

Technical Management

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P/O :
Project Name : Monitoring EIA
Project Location : GTS4

Lot ID: 25100100 (7)

Date Received : Nov 12, 2025
Date Reported : Nov 19, 2025
Report Number: 25100100 (7)-1 C1

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GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Spot : Water Treatment Control Building : Fire Pump	25100100 (7)-1	10-Nov-25	Day time	1	1,225	-	300-400	-	Pass
		25100100 (7)-2	10-Nov-25	Day time	2	1,008	-	300	-	
		25100100 (7)-3	10-Nov-25	Day time	3	878	-	200	-	
		25100100 (7)-4	10-Nov-25	Night time	1	335	-	300-400	-	
2	Spot : Water Treatment Control Building : Laboratory 1 (Fume Hood)	25100100 (7)-5	10-Nov-25	Day time	1	498	-	400-500	-	Pass
		25100100 (7)-6	10-Nov-25	Night time	1	691	-	400-500	-	Pass
3	Spot : Water Treatment Control Building : Laboratory 2 (Water Table)	25100100 (7)-7	10-Nov-25	Day time	1	590	-	400-500	-	Pass
		25100100 (7)-8	10-Nov-25	Night time	1	532	-	400-500	-	Pass
4	Spot : Water Treatment Control Building : Office Laboratory	25100100 (7)-9	10-Nov-25	Day time	1	494	-	400-500	-	Pass
		25100100 (7)-10	10-Nov-25	Night time	1	522	-	400-500	-	Pass
5	Spot : Water Treatment Control Building : Water Treatment	25100100 (7)-11	10-Nov-25	Day time	1	709	-	300-400	-	Pass
		25100100 (7)-12	10-Nov-25	Night time	1	875	-	300-400	-	Pass

Measurement by : Nattakarn Vonginyoo

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Technical Management

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225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location: GTS4

Lot ID: 25100100 (8)

Date Received : Nov 12, 2025

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GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Spot : Workshop and Warehouse : 2nd Floor : เครื่องจักรกลสาร	25100100 (8)-1	10-Nov-25	Day time	1	510	-	300-400	-	Pass
4	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ ME 1	25100100 (8)-2	10-Nov-25	Day time	1	1,461	-	400-500	-	Pass
		25100100 (8)-3	10-Nov-25	Day time	2	860	-	300	-	
		25100100 (8)-4	10-Nov-25	Day time	3	912	-	200	-	
5	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ ME 2	25100100 (8)-5	10-Nov-25	Day time	1	1,875	-	400-500	-	Pass
		25100100 (8)-6	10-Nov-25	Day time	2	1,633	-	300	-	
		25100100 (8)-7	10-Nov-25	Day time	3	4,300	-	200	-	
6	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ ME 3	25100100 (8)-8	10-Nov-25	Day time	1	530	-	400-500	-	Pass
7	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ ME 4	25100100 (8)-9	10-Nov-25	Day time	1	496	-	400-500	-	Pass
8	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ MI 1	25100100 (8)-10	10-Nov-25	Day time	1	441	-	400-500	-	Pass
9	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ MI 2	25100100 (8)-11	10-Nov-25	Day time	1	411	-	400-500	-	Pass
10	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ MI 3	25100100 (8)-12	10-Nov-25	Day time	1	441	-	400-500	-	Pass
11	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ MI 4	25100100 (8)-13	10-Nov-25	Day time	1	410	-	400-500	-	Pass
12	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ MM 1	25100100 (8)-14	10-Nov-25	Day time	1	402	-	400-500	-	Pass
13	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ MM 2	25100100 (8)-15	10-Nov-25	Day time	1	404	-	400-500	-	Pass
14	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ MM 3	25100100 (8)-16	10-Nov-25	Day time	1	434	-	400-500	-	Pass
15	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ MM 4	25100100 (8)-17	10-Nov-25	Day time	1	420	-	400-500	-	Pass
16	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ MM Manager	25100100 (8)-18	10-Nov-25	Day time	1	575	-	400-500	-	Pass
17	Area : Workshop and Warehouse : 2nd Floor : ทางเดิน ชั้น 2	25100100 (8)-19	10-Nov-25	Day time	1	1,396	1092	50	100	Pass
		25100100 (8)-20	10-Nov-25	Day time	2	717				
		25100100 (8)-21	10-Nov-25	Day time	3	1,163				

Technical Management

Supt S
Supt Salamatheh
Section Head

Approved by

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Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.

225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140

P/O :

Project Name : Monitoring EIA

Project Location: GTS4

Lot ID: 25100100 (8)

Date Received : Nov 12, 2025

Date Reported : Nov 19, 2025

Report Number: 25100100 (8)-1 C1

Page 2 of 2

GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
20	Area : Workshop and Warehouse : 2nd Floor : ห้องเก็บเอกสาร	25100100 (8)-26	10-Nov-25	Day time	1	205	202	100	200	Pass
		25100100 (8)-27	10-Nov-25	Day time	2	200				
21	Area : Workshop and Warehouse : 2nd Floor : ห้องนำขยะ	25100100 (8)-28	10-Nov-25	Day time	1	518	558	50	100	Pass
		25100100 (8)-29	10-Nov-25	Day time	2	599				
22	Area : Workshop and Warehouse : 2nd Floor : ห้องประชุม	25100100 (8)-30	10-Nov-25	Day time	1	3,000	1664	150	300	Pass
		25100100 (8)-31	10-Nov-25	Day time	2	1,422				
		25100100 (8)-32	10-Nov-25	Day time	3	1,505				
		25100100 (8)-33	10-Nov-25	Day time	4	1,009				
		25100100 (8)-34	10-Nov-25	Day time	5	1,272				
		25100100 (8)-35	10-Nov-25	Day time	6	1,779				
23	Area : Workshop and Warehouse : 2nd Floor : ห้องฝึกฝน W/H	25100100 (8)-36	10-Nov-25	Day time	1	900	902	25	50	Pass
		25100100 (8)-37	10-Nov-25	Day time	2	903				
24	Area : Workshop and Warehouse : 2nd Floor : Store	25100100 (8)-38	10-Nov-25	Day time	1	442	987	100	200	Pass
		25100100 (8)-39	10-Nov-25	Day time	2	645				
		25100100 (8)-40	10-Nov-25	Day time	3	674				
		25100100 (8)-41	10-Nov-25	Day time	4	444				
		25100100 (8)-42	10-Nov-25	Day time	5	1,230				
		25100100 (8)-43	10-Nov-25	Day time	6	1,208				
		25100100 (8)-44	10-Nov-25	Day time	7	1,341				
		25100100 (8)-45	10-Nov-25	Day time	8	807				
		25100100 (8)-46	10-Nov-25	Day time	9	1,122				
		25100100 (8)-47	10-Nov-25	Day time	10	1,257				
		25100100 (8)-48	10-Nov-25	Day time	11	979				
		25100100 (8)-49	10-Nov-25	Day time	12	1,295				
		25100100 (8)-50	10-Nov-25	Day time	13	1,230				
		25100100 (8)-51	10-Nov-25	Day time	14	703				
		25100100 (8)-52	10-Nov-25	Day time	15	1,306				
		25100100 (8)-53	10-Nov-25	Day time	16	1,106				

Measurement by : Nattakarn Vonginyoo

Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

Technical Management

Supt S
Supt Salamatheh
Section Head

Approved by

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Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140
P/O :
Project Name : Monitoring EIA
Project Location: GTS4

Lot ID: 25100100 (9)

Date Received : Nov 12, 2025
Date Reported : Nov 19, 2025
Report Number: 25100100 (9)-1 C1

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GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : Workshop and Warehouse : Ground Floor : Store ชั้น 1	25100100 (9)-1	10-Nov-25	Day time	1	780	839	100	200	Pass
		25100100 (9)-2	10-Nov-25	Day time	2	783				
		25100100 (9)-3	10-Nov-25	Day time	3	834				
		25100100 (9)-4	10-Nov-25	Day time	4	811				
		25100100 (9)-5	10-Nov-25	Day time	5	944				
		25100100 (9)-6	10-Nov-25	Day time	6	860				
		25100100 (9)-7	10-Nov-25	Day time	7	875				
		25100100 (9)-8	10-Nov-25	Day time	8	801				
		25100100 (9)-9	10-Nov-25	Day time	9	848				
		25100100 (9)-10	10-Nov-25	Day time	10	972				
		25100100 (9)-11	10-Nov-25	Day time	11	965				
		25100100 (9)-12	10-Nov-25	Day time	12	936				
		25100100 (9)-13	10-Nov-25	Day time	13	789				
		25100100 (9)-14	10-Nov-25	Day time	14	785				
		25100100 (9)-15	10-Nov-25	Day time	15	711				
		25100100 (9)-16	10-Nov-25	Day time	16	731				
2	Area : Workshop and Warehouse : Ground Floor : ทางเข้า W/H	25100100 (9)-17	10-Nov-25	Day time	1	2,310	2210	50	100	Pass
		25100100 (9)-18	10-Nov-25	Day time	2	2,110				
3	Area : Workshop and Warehouse : Ground Floor : ทางเดิน W/H ใหญ่	25100100 (9)-19	10-Nov-25	Day time	1	601	730	50	100	Pass
		25100100 (9)-20	10-Nov-25	Day time	2	859				
4	Area : Workshop and Warehouse : Ground Floor : ทางเดิน ชั้น 1	25100100 (9)-21	10-Nov-25	Day time	1	260	594	50	100	Pass
		25100100 (9)-22	10-Nov-25	Day time	2	852				
		25100100 (9)-23	10-Nov-25	Day time	3	958				
		25100100 (9)-24	10-Nov-25	Day time	4	768				
		25100100 (9)-25	10-Nov-25	Day time	5	308				
		25100100 (9)-26	10-Nov-25	Day time	6	415				
5	Area : Workshop and Warehouse : Ground Floor : ห้อง Tool Room (AC 1-3)	25100100 (9)-27	10-Nov-25	Day time	1	596	729	100	200	Pass
		25100100 (9)-28	10-Nov-25	Day time	2	967				
		25100100 (9)-29	10-Nov-25	Day time	3	623				
6	Spot : Workshop and Warehouse : Ground Floor : ห้อง W/H Office 1 TS4	25100100 (9)-30	10-Nov-25	Day time	1	459	-	400-500	-	Pass
7	Spot : Workshop and Warehouse : Ground Floor : ห้อง W/H Office 2 TS3	25100100 (9)-31	10-Nov-25	Day time	1	409	-	400-500	-	Pass

Technical Management

Supot S.
Supot Salamteh
Section Head

Approved by

Wichan Choonharat
Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140
P/O :
Project Name : Monitoring EIA
Project Location: GTS4

Lot ID: 25100100 (9)

Date Received : Nov 12, 2025
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Report Number: 25100100 (9)-1 C1

Page 2 of 2

GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
8	Spot : Workshop and Warehouse : Ground Floor : โต๊ะ Calibration ห้องปฏิบัติการ การเครื่องมือวัด	25100100 (9)-32	10-Nov-25	Day time	1	607	-	400-500	-	Pass
9	Area : Workshop and Warehouse : Ground Floor : ห้องปฏิบัติงานเครื่องกล- ไฟฟ้า	25100100 (9)-33	10-Nov-25	Day time	1	685	553	150	300	Pass
		25100100 (9)-34	10-Nov-25	Day time	2	716				
		25100100 (9)-35	10-Nov-25	Day time	3	788				
		25100100 (9)-36	10-Nov-25	Day time	4	230				
		25100100 (9)-37	10-Nov-25	Day time	5	341				
		25100100 (9)-38	10-Nov-25	Day time	6	317				
		25100100 (9)-39	10-Nov-25	Day time	7	536				
		25100100 (9)-40	10-Nov-25	Day time	8	637				
		25100100 (9)-41	10-Nov-25	Day time	9	725				

Measurement by : Nattakarn Vonginyoo

Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

Technical Management

Supot S.
Supot Salamteh
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Analysis / Test Report

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225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140
P/O :
Project Name : Monitoring EIA
Project Location: GTS4

Lot ID: 25102269 (1)

Date Received : Nov 12, 2025
Date Reported : Jan 19, 2026
Report Number: 25102269 (1)-1 C1

Page 1 of 4

GTS4											
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment	
						Spot	Average	Spot/Min	Average		
1	Area : ทางเดินภายนอกอาคาร : ทางเดินหน้า Gas Metering	25102269 (1)-1	10-Nov-25	Night time	1	31	104	25	50	Pass	
		25102269 (1)-2	10-Nov-25	Night time	2	42					
		25102269 (1)-3	10-Nov-25	Night time	3	77					
		25102269 (1)-4	10-Nov-25	Night time	4	98					
		25102269 (1)-5	10-Nov-25	Night time	5	106					
		25102269 (1)-6	10-Nov-25	Night time	6	99					
		25102269 (1)-7	10-Nov-25	Night time	7	70					
		25102269 (1)-8	10-Nov-25	Night time	8	49					
		25102269 (1)-9	10-Nov-25	Night time	9	79					
		25102269 (1)-10	10-Nov-25	Night time	10	88					
		25102269 (1)-11	10-Nov-25	Night time	11	73					
		25102269 (1)-12	10-Nov-25	Night time	12	70					
		25102269 (1)-13	10-Nov-25	Night time	13	104					
		25102269 (1)-14	10-Nov-25	Night time	14	117					
		25102269 (1)-15	10-Nov-25	Night time	15	84					
		25102269 (1)-16	10-Nov-25	Night time	16	83					
		25102269 (1)-17	10-Nov-25	Night time	17	103					
		25102269 (1)-18	10-Nov-25	Night time	18	85					
		25102269 (1)-19	10-Nov-25	Night time	19	75					
		25102269 (1)-20	10-Nov-25	Night time	20	73					
		25102269 (1)-21	10-Nov-25	Night time	21	70					
		25102269 (1)-22	10-Nov-25	Night time	22	86					
		25102269 (1)-23	10-Nov-25	Night time	23	117					
		25102269 (1)-24	10-Nov-25	Night time	24	94					
		25102269 (1)-25	10-Nov-25	Night time	25	119					
		25102269 (1)-26	10-Nov-25	Night time	26	103					
		25102269 (1)-27	10-Nov-25	Night time	27	141					
		25102269 (1)-28	10-Nov-25	Night time	28	145					
		25102269 (1)-29	10-Nov-25	Night time	29	144					
		25102269 (1)-30	10-Nov-25	Night time	30	156					
		25102269 (1)-31	10-Nov-25	Night time	31	133					
		25102269 (1)-32	10-Nov-25	Night time	32	120					
		25102269 (1)-33	10-Nov-25	Night time	33	109					
		25102269 (1)-34	10-Nov-25	Night time	34	107					
		25102269 (1)-35	10-Nov-25	Night time	35	131					
		25102269 (1)-36	10-Nov-25	Night time	36	132					
		25102269 (1)-37	10-Nov-25	Night time	37	145					
		25102269 (1)-38	10-Nov-25	Night time	38	132					
		25102269 (1)-39	10-Nov-25	Night time	39	112					

Technical Management

Supot S.
Supot Salamteh
Section Head

Approved by

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Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140
P/O :
Project Name : Monitoring EIA
Project Location: GTS4

Lot ID: 25102269 (1)

Date Received : Nov 12, 2025
Date Reported : Jan 19, 2026
Report Number: 25102269 (1)-1 C1

Page 2 of 4

GTS4											
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment	
						Spot	Average	Spot/Min	Average		
1	Area : ทางเดินภายนอกอาคาร : ทางเดินหน้า Gas Metering	25102269 (1)-40	10-Nov-25	Night time	40	109	127	25	50	Pass	
		25102269 (1)-41	10-Nov-25	Night time	41	133					
		25102269 (1)-42	10-Nov-25	Night time	42	134					
		25102269 (1)-43	10-Nov-25	Night time	43	142					
		25102269 (1)-44	10-Nov-25	Night time	44	111					
		25102269 (1)-45	10-Nov-25	Night time	45	133					
		25102269 (1)-46	10-Nov-25	Night time	46	120					
2	Area : ทางเดินภายนอกอาคาร : ทางเดินระหว่าง Gas Metering และ GT3	25102269 (1)-47	10-Nov-25	Night time	1	136	127	25	50	Pass	
		25102269 (1)-48	10-Nov-25	Night time	2	122					
		25102269 (1)-49	10-Nov-25	Night time	3	135					
		25102269 (1)-50	10-Nov-25	Night time	4	134					
		25102269 (1)-51	10-Nov-25	Night time	5	115					
		25102269 (1)-52	10-Nov-25	Night time	6	129					
		25102269 (1)-53	10-Nov-25	Night time	7	126					
		25102269 (1)-54	10-Nov-25	Night time	8	122					

Technical Management

Supot S.
Supot Salamteh
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Assistant Manager

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225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140
P/O :
Project Name : Monitoring EIA
Project Location: GTS4

Lot ID: 25102269 (1)

Date Received : Nov 12, 2025
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Report Number: 25102269 (1)-1 C1

Page 3 of 4

GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
3	Area : ทางเดินภายในอาคาร : ทางเดินหน้า GT GTS3	25102269 (1)-55	10-Nov-25	Night time	1	95	104	25	50	Pass
		25102269 (1)-56	10-Nov-25	Night time	2	86				
		25102269 (1)-57	10-Nov-25	Night time	3	83				
		25102269 (1)-58	10-Nov-25	Night time	4	86				
		25102269 (1)-59	10-Nov-25	Night time	5	113				
		25102269 (1)-60	10-Nov-25	Night time	6	105				
		25102269 (1)-61	10-Nov-25	Night time	7	180				
		25102269 (1)-62	10-Nov-25	Night time	8	168				
		25102269 (1)-63	10-Nov-25	Night time	9	102				
		25102269 (1)-64	10-Nov-25	Night time	10	114				
		25102269 (1)-65	10-Nov-25	Night time	11	186				
		25102269 (1)-66	10-Nov-25	Night time	12	144				
		25102269 (1)-67	10-Nov-25	Night time	13	103				
		25102269 (1)-68	10-Nov-25	Night time	14	107				
		25102269 (1)-69	10-Nov-25	Night time	15	136				
		25102269 (1)-70	10-Nov-25	Night time	16	145				
		25102269 (1)-71	10-Nov-25	Night time	17	121				
		25102269 (1)-72	10-Nov-25	Night time	18	118				
		25102269 (1)-73	10-Nov-25	Night time	19	149				
		25102269 (1)-74	10-Nov-25	Night time	20	135				
		25102269 (1)-75	10-Nov-25	Night time	21	98				
		25102269 (1)-76	10-Nov-25	Night time	22	91				
		25102269 (1)-77	10-Nov-25	Night time	23	123				
		25102269 (1)-78	10-Nov-25	Night time	24	118				
		25102269 (1)-79	10-Nov-25	Night time	25	93				
		25102269 (1)-80	10-Nov-25	Night time	26	107				
		25102269 (1)-81	10-Nov-25	Night time	27	79				
		25102269 (1)-82	10-Nov-25	Night time	28	61				
		25102269 (1)-83	10-Nov-25	Night time	29	46				
		25102269 (1)-84	10-Nov-25	Night time	30	34				
		25102269 (1)-85	10-Nov-25	Night time	31	35				
		25102269 (1)-86	10-Nov-25	Night time	32	32				
		25102269 (1)-87	10-Nov-25	Night time	33	28				
		25102269 (1)-88	10-Nov-25	Night time	34	35				
		25102269 (1)-89	10-Nov-25	Night time	35	36				
		25102269 (1)-90	10-Nov-25	Night time	36	41				
		25102269 (1)-91	10-Nov-25	Night time	37	29				
		25102269 (1)-92	10-Nov-25	Night time	38	73				
		25102269 (1)-93	10-Nov-25	Night time	39	59				

Technical Management

Supot S.
Supot Salamteh
Section Head

Approved by

Nichan Chonharat
Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140
P/O :
Project Name : Monitoring EIA
Project Location: GTS4

Lot ID: 25102269 (1)

Date Received : Nov 12, 2025
Date Reported : Jan 19, 2026
Report Number: 25102269 (1)-1 C1

Page 4 of 4

GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
3	Area : ทางเดินภายในอาคาร : ทางเดินหน้า GT GTS3	25102269 (1)-94	10-Nov-25	Night time	40	74				
		25102269 (1)-95	10-Nov-25	Night time	41	134				
		25102269 (1)-96	10-Nov-25	Night time	42	140				
		25102269 (1)-97	10-Nov-25	Night time	43	116				
		25102269 (1)-98	10-Nov-25	Night time	44	154				
		25102269 (1)-99	10-Nov-25	Night time	45	126				
		25102269 (1)-100	10-Nov-25	Night time	46	110				
		25102269 (1)-101	10-Nov-25	Night time	47	109				
		25102269 (1)-102	10-Nov-25	Night time	48	97				
		25102269 (1)-103	10-Nov-25	Night time	49	83				
		25102269 (1)-104	10-Nov-25	Night time	50	85				
		25102269 (1)-105	10-Nov-25	Night time	51	99				
		25102269 (1)-106	10-Nov-25	Night time	52	105				
		25102269 (1)-107	10-Nov-25	Night time	53	104				
		25102269 (1)-108	10-Nov-25	Night time	54	110				
		25102269 (1)-109	10-Nov-25	Night time	55	126				
		25102269 (1)-110	10-Nov-25	Night time	56	133				
		25102269 (1)-111	10-Nov-25	Night time	57	140				
		25102269 (1)-112	10-Nov-25	Night time	58	144				
		25102269 (1)-113	10-Nov-25	Night time	59	122				
		25102269 (1)-114	10-Nov-25	Night time	60	120				
		25102269 (1)-115	10-Nov-25	Night time	61	109				
		25102269 (1)-116	10-Nov-25	Night time	62	70				
		25102269 (1)-117	10-Nov-25	Night time	63	104				
		25102269 (1)-118	10-Nov-25	Night time	64	117				
		25102269 (1)-119	10-Nov-25	Night time	65	122				
		25102269 (1)-120	10-Nov-25	Night time	66	120				
		25102269 (1)-121	10-Nov-25	Night time	67	142				
		25102269 (1)-122	10-Nov-25	Night time	68	150				

Measurement by : Nattakarn Vonginyoo

Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

Technical Management

Supot S.
Supot Salamteh
Section Head

Approved by

Nichan Chonharat
Wichan Choonharat
Assistant Manager

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Analysis / Test Report

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225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140
P/O :
Project Name : Monitoring EIA
Project Location: GTS4

Lot ID: 25102271 (1)

Date Received : Nov 12, 2025
Date Reported : Nov 14, 2025
Report Number: 25102271 (1)-1

Page 1 of 6

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : ทางเดินภายในอาคาร : ทางเดินหน้าตึก Admin	25102271 (1)-1	10-Nov-25	Night time	1	81	58	25	50	Pass
		25102271 (1)-2	10-Nov-25	Night time	2	54				
		25102271 (1)-3	10-Nov-25	Night time	3	29				
		25102271 (1)-4	10-Nov-25	Night time	4	33				
		25102271 (1)-5	10-Nov-25	Night time	5	56				
		25102271 (1)-6	10-Nov-25	Night time	6	91				
		25102271 (1)-7	10-Nov-25	Night time	7	92				
		25102271 (1)-8	10-Nov-25	Night time	8	44				
		25102271 (1)-9	10-Nov-25	Night time	9	45				
		25102271 (1)-10	10-Nov-25	Night time	10	37				
		25102271 (1)-11	10-Nov-25	Night time	11	39				
		25102271 (1)-12	10-Nov-25	Night time	12	40				
		25102271 (1)-13	10-Nov-25	Night time	13	41				
		25102271 (1)-14	10-Nov-25	Night time	14	42				
		25102271 (1)-15	10-Nov-25	Night time	15	42				
		25102271 (1)-16	10-Nov-25	Night time	16	59				
		25102271 (1)-17	10-Nov-25	Night time	17	59				
		25102271 (1)-18	10-Nov-25	Night time	18	61				
		25102271 (1)-19	10-Nov-25	Night time	19	55				
		25102271 (1)-20	10-Nov-25	Night time	20	109				
		25102271 (1)-21	10-Nov-25	Night time	21	72				
		25102271 (1)-22	10-Nov-25	Night time	22	91				
		25102271 (1)-23	10-Nov-25	Night time	23	92				
		25102271 (1)-24	10-Nov-25	Night time	24	25				
		25102271 (1)-25	10-Nov-25	Night time	25	31				
		25102271 (1)-26	10-Nov-25	Night time	26	32				
		25102271 (1)-27	10-Nov-25	Night time	27	48				
		25102271 (1)-28	10-Nov-25	Night time	28	53				
		25102271 (1)-29	10-Nov-25	Night time	29	50				
		25102271 (1)-30	10-Nov-25	Night time	30	51				
		25102271 (1)-31	10-Nov-25	Night time	31	59				
		25102271 (1)-32	10-Nov-25	Night time	32	77				
		25102271 (1)-33	10-Nov-25	Night time	33	80				
		25102271 (1)-34	10-Nov-25	Night time	34	83				
		25102271 (1)-35	10-Nov-25	Night time	35	92				

Technical Management

Supot S.
Supot Salamteh
Section Head

Approved by

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Wichan Choonharat
Assistant Manager

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Analysis / Test Report

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225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140
P/O :
Project Name : Monitoring EIA
Project Location: GTS4

Lot ID: 25102271 (1)

Date Received : Nov 12, 2025
Date Reported : Nov 14, 2025
Report Number: 25102271 (1)-1

Page 2 of 6

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
2	Area : ทางเดินภายในอาคาร : ทางเดินข้าง Gas Metering และ GTS4	25102271 (1)-36	10-Nov-25	Night time	1	33	58	25	50	Pass
		25102271 (1)-37	10-Nov-25	Night time	2	34				
		25102271 (1)-38	10-Nov-25	Night time	3	36				
		25102271 (1)-39	10-Nov-25	Night time	4	45				
		25102271 (1)-40	10-Nov-25	Night time	5	46				
		25102271 (1)-41	10-Nov-25	Night time	6	49				
		25102271 (1)-42	10-Nov-25	Night time	7	50				
		25102271 (1)-43	10-Nov-25	Night time	8	51				
		25102271 (1)-44	10-Nov-25	Night time	9	59				
		25102271 (1)-45	10-Nov-25	Night time	10	66				
		25102271 (1)-46	10-Nov-25	Night time	11	56				
		25102271 (1)-47	10-Nov-25	Night time	12	76				
		25102271 (1)-48	10-Nov-25	Night time	13	77				
		25102271 (1)-49	10-Nov-25	Night time	14	78				
		25102271 (1)-50	10-Nov-25	Night time	15	98				
		25102271 (1)-51	10-Nov-25	Night time	16	92				
		25102271 (1)-52	10-Nov-25	Night time	17	88				
		25102271 (1)-53	10-Nov-25	Night time	18	80				
		25102271 (1)-54	10-Nov-25	Night time	19	71				
		25102271 (1)-55	10-Nov-25	Night time	20	72				
		25102271 (1)-56	10-Nov-25	Night time	21	64				
		25102271 (1)-57	10-Nov-25	Night time	22	43				
		25102271 (1)-58	10-Nov-25	Night time	23	44				
		25102271 (1)-59	10-Nov-25	Night time	24	52				
		25102271 (1)-60	10-Nov-25	Night time	25	42				
		25102271 (1)-61	10-Nov-25	Night time	26	28				
		25102271 (1)-62	10-Nov-25	Night time	27	44				
		25102271 (1)-63	10-Nov-25	Night time	28	40				
		25102271 (1)-64	10-Nov-25	Night time	29	32				
		25102271 (1)-65	10-Nov-25	Night time	30	33				
		25102271 (1)-66	10-Nov-25	Night time	31	25				
		25102271 (1)-67	10-Nov-25	Night time	32	27				
		25102271 (1)-68	10-Nov-25	Night time	33	30				
		25102271 (1)-69	10-Nov-25	Night time	34	44				
		25102271 (1)-70	10-Nov-25	Night time	35	26				
		25102271 (1)-71	10-Nov-25	Night time	36	30				
		25102271 (1)-72	10-Nov-25	Night time	37	26				
		25102271 (1)-73	10-Nov-25	Night time	38	25				
		25102271 (1)-74	10-Nov-25	Night time	39	32				

Technical Management

Supot S.
Supot Salamteh
Section Head

Approved by

Nichan Chonharat
Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : Gulf TS4 Co., Ltd.
225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140
P/O :
Project Name : Monitoring EIA
Project Location: GTS4

Lot ID: 25102271 (1)

Date Received : Nov 12, 2025
Date Reported : Nov 14, 2025
Report Number: 25102271 (1)-1

Page 3 of 6

GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
2	Area : ทางเดินภายในอาคาร : ทางเดินข้าง Gas Metering และ GTS4	25102271 (1)-75	10-Nov-25	Night time	40	33				
		25102271 (1)-76	10-Nov-25	Night time	41	25				
		25102271 (1)-77	10-Nov-25	Night time	42	26				
		25102271 (1)-78	10-Nov-25	Night time	43	39				
		25102271 (1)-79	10-Nov-25	Night time	44	27				
		25102271 (1)-80	10-Nov-25	Night time	45	25				
		25102271 (1)-81	10-Nov-25	Night time	46	30				
		25102271 (1)-82	10-Nov-25	Night time	47	42				
		25102271 (1)-83	10-Nov-25	Night time	48	42				
		25102271 (1)-84	10-Nov-25	Night time	49	32				
		25102271 (1)-85	10-Nov-25	Night time	50	44				
		25102271 (1)-86	10-Nov-25	Night time	51	80				
		25102271 (1)-87	10-Nov-25	Night time	52	99				
		25102271 (1)-88	10-Nov-25	Night time	53	102				
		25102271 (1)-89	10-Nov-25	Night time	54	105				
		25102271 (1)-90	10-Nov-25	Night time	55	106				
		25102271 (1)-91	10-Nov-25	Night time	56	117				
		25102271 (1)-92	10-Nov-25	Night time	57	119				
		25102271 (1)-93	10-Nov-25	Night time	58	145				
		25102271 (1)-94	10-Nov-25	Night time	59	132				
		25102271 (1)-95	10-Nov-25	Night time	60	133				

Technical Management

Supot S.
Supot Salamteh
Section Head

Approved by

Wichan Choonharat
Wichan Choonharat
Assistant Manager

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P/O :
Project Name : Monitoring EIA
Project Location: GTS4

Lot ID: 25102271 (1)

Date Received : Nov 12, 2025
Date Reported : Nov 14, 2025
Report Number: 25102271 (1)-1

Page 4 of 6

GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
3	Area : ทางเดินภายในอาคาร : ทางเดินหน้า CTBD	25102271 (1)-96	10-Nov-25	Night time	1	144	161	25	50	Pass
		25102271 (1)-97	10-Nov-25	Night time	2	177				
		25102271 (1)-98	10-Nov-25	Night time	3	131				
		25102271 (1)-99	10-Nov-25	Night time	4	125				
		25102271 (1)-100	10-Nov-25	Night time	5	137				
		25102271 (1)-101	10-Nov-25	Night time	6	169				
		25102271 (1)-102	10-Nov-25	Night time	7	155				
		25102271 (1)-103	10-Nov-25	Night time	8	163				
		25102271 (1)-104	10-Nov-25	Night time	9	162				
		25102271 (1)-105	10-Nov-25	Night time	10	157				
		25102271 (1)-106	10-Nov-25	Night time	11	163				
		25102271 (1)-107	10-Nov-25	Night time	12	166				
		25102271 (1)-108	10-Nov-25	Night time	13	177				
		25102271 (1)-109	10-Nov-25	Night time	14	181				
		25102271 (1)-110	10-Nov-25	Night time	15	186				
		25102271 (1)-111	10-Nov-25	Night time	16	180				
		25102271 (1)-112	10-Nov-25	Night time	17	162				
		25102271 (1)-113	10-Nov-25	Night time	18	160				
		25102271 (1)-114	10-Nov-25	Night time	19	175				
		25102271 (1)-115	10-Nov-25	Night time	20	171				
		25102271 (1)-116	10-Nov-25	Night time	21	163				
		25102271 (1)-117	10-Nov-25	Night time	22	139				

Technical Management

Supot S.
Supot Salamteh
Section Head

Approved by

Wichan Choonharat
Wichan Choonharat
Assistant Manager

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225 Moo 3, WHA Eastern Seaboard Industrial Estate 1, Tasit, Pluak Daeng, Rayong Thailand 21140
P/O :
Project Name : Monitoring EIA
Project Location: GTS4

Lot ID: 25102271 (1)

Date Received : Nov 12, 2025
Date Reported : Nov 14, 2025
Report Number: 25102271 (1)-1

Page 5 of 6

GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
4	Area : ทางเดินภายในอาคาร : ทางเดินหน้า GT GTS4	25102271 (1)-118	10-Nov-25	Night time	1	155	123	25	50	Pass
		25102271 (1)-119	10-Nov-25	Night time	2	151				
		25102271 (1)-120	10-Nov-25	Night time	3	158				
		25102271 (1)-121	10-Nov-25	Night time	4	168				
		25102271 (1)-122	10-Nov-25	Night time	5	169				
		25102271 (1)-123	10-Nov-25	Night time	6	133				
		25102271 (1)-124	10-Nov-25	Night time	7	143				
		25102271 (1)-125	10-Nov-25	Night time	8	155				
		25102271 (1)-126	10-Nov-25	Night time	9	177				
		25102271 (1)-127	10-Nov-25	Night time	10	141				
		25102271 (1)-128	10-Nov-25	Night time	11	133				
		25102271 (1)-129	10-Nov-25	Night time	12	126				
		25102271 (1)-130	10-Nov-25	Night time	13	129				
		25102271 (1)-131	10-Nov-25	Night time	14	127				
		25102271 (1)-132	10-Nov-25	Night time	15	134				
		25102271 (1)-133	10-Nov-25	Night time	16	89				
		25102271 (1)-134	10-Nov-25	Night time	17	100				
		25102271 (1)-135	10-Nov-25	Night time	18	99				
		25102271 (1)-136	10-Nov-25	Night time	19	43				
		25102271 (1)-137	10-Nov-25	Night time	20	44				
		25102271 (1)-138	10-Nov-25	Night time	21	55				
		25102271 (1)-139	10-Nov-25	Night time	22	56				
		25102271 (1)-140	10-Nov-25	Night time	23	77				
		25102271 (1)-141	10-Nov-25	Night time	24	51				
		25102271 (1)-142	10-Nov-25	Night time	25	61				
		25102271 (1)-143	10-Nov-25	Night time	26	55				
		25102271 (1)-144	10-Nov-25	Night time	27	56				
		25102271 (1)-145	10-Nov-25	Night time	28	58				
		25102271 (1)-146	10-Nov-25	Night time	29	64				
		25102271 (1)-147	10-Nov-25	Night time	30	68				
		25102271 (1)-148	10-Nov-25	Night time	31	66				
		25102271 (1)-149	10-Nov-25	Night time	32	72				
		25102271 (1)-150	10-Nov-25	Night time	33	81				
		25102271 (1)-151	10-Nov-25	Night time	34	87				
		25102271 (1)-152	10-Nov-25	Night time	35	79				
		25102271 (1)-153	10-Nov-25	Night time	36	76				
		25102271 (1)-154	10-Nov-25	Night time	37	77				
		25102271 (1)-155	10-Nov-25	Night time	38	93				
		25102271 (1)-156	10-Nov-25	Night time	39	127				

Technical Management

Supt S
Supot Salamteh
Section Head

Approved by

Nichan Chonharat
Wichan Choonharat
Assistant Manager

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P/O :
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Project Location: GTS4

Lot ID: 25102271 (1)

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Page 6 of 6

GTS4										
Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
4	Area : ทางเดินภายในอาคาร : ทางเดินหน้า GT GTS4	25102271 (1)-157	10-Nov-25	Night time	40	129	123	25	50	Pass
		25102271 (1)-158	10-Nov-25	Night time	41	132				
		25102271 (1)-159	10-Nov-25	Night time	42	133				
		25102271 (1)-160	10-Nov-25	Night time	43	144				
		25102271 (1)-161	10-Nov-25	Night time	44	161				
		25102271 (1)-162	10-Nov-25	Night time	45	156				
		25102271 (1)-163	10-Nov-25	Night time	46	150				
		25102271 (1)-164	10-Nov-25	Night time	47	149				
		25102271 (1)-165	10-Nov-25	Night time	48	147				
		25102271 (1)-166	10-Nov-25	Night time	49	155				
		25102271 (1)-167	10-Nov-25	Night time	50	166				
		25102271 (1)-168	10-Nov-25	Night time	51	143				
		25102271 (1)-169	10-Nov-25	Night time	52	159				
		25102271 (1)-170	10-Nov-25	Night time	53	155				
		25102271 (1)-171	10-Nov-25	Night time	54	144				
		25102271 (1)-172	10-Nov-25	Night time	55	167				
		25102271 (1)-173	10-Nov-25	Night time	56	169				
		25102271 (1)-174	10-Nov-25	Night time	57	177				
		25102271 (1)-175	10-Nov-25	Night time	58	170				
		25102271 (1)-176	10-Nov-25	Night time	59	144				
		25102271 (1)-177	10-Nov-25	Night time	60	156				
		25102271 (1)-178	10-Nov-25	Night time	61	163				
		25102271 (1)-179	10-Nov-25	Night time	62	166				
		25102271 (1)-180	10-Nov-25	Night time	63	164				
		25102271 (1)-181	10-Nov-25	Night time	64	155				
		25102271 (1)-182	10-Nov-25	Night time	65	153				
		25102271 (1)-183	10-Nov-25	Night time	66	140				
		25102271 (1)-184	10-Nov-25	Night time	67	132				
		25102271 (1)-185	10-Nov-25	Night time	68	122				

Measurement by : Nattakarn Vonginyoo

Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

Technical Management

Supt S
Supot Salamteh
Section Head

Approved by

Nichan Chonharat
Wichan Choonharat
Assistant Manager

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. The report shall not be reproduced except in full without the written approval of the laboratory.

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ภาคผนวก ค-10

แผนผังแสดงเส้นระดับเสียง (Noise Contour Map)



Measurement Date : Aug 14, 2024

บริเวณกระบวนการผลิตไฟฟ้าที่มีเสียงดัง



ภาคผนวก ง

ใบรับรองการสอบเทียบเครื่องมือ



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Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Ambient	Nitrogen Dioxide	NO ₂ Analyzer	RYG_F50455	3-Jul-25	3-Jan-26	6
Ambient	Nitrogen Dioxide	NO ₂ Analyzer	BKK_F50797	2-Jul-25	2-Jan-26	6
Ambient	Nitrogen Dioxide	NO ₂ Analyzer	RYG_F50252	1-Jul-25	1-Jan-26	6
Ambient	Nitrogen Dioxide	NO ₂ Analyzer	RYG_F50255	1-Jul-25	1-Jan-26	6
Ambient	Sulfur Dioxide	SO ₂ Analyzer	RYG_F50454	2-Jul-25	2-Jan-26	6
Ambient	Sulfur Dioxide	SO ₂ Analyzer	BKK_F50796	1-Jul-25	1-Jan-26	6
Ambient	Sulfur Dioxide	SO ₂ Analyzer	RYG_F50251	2-Jul-25	2-Jan-26	6
Ambient	Sulfur Dioxide	SO ₂ Analyzer	RYG_F50254	2-Jul-25	2-Jan-26	6
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	RYG_F50089	7-Oct-24	7-Apr-26	18
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	RYG_F50329	7-May-25	6-Nov-26	18
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	RYG_F50087	7-Oct-24	7-Apr-26	18
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	RYG_F50414	29-Oct-24	29-Apr-26	18
Ambient	Particulate Matter (PM-10)	High Volume	RYG_F50295	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	High Volume	RYG_F50294	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	High Volume	RYG_F50397	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	High Volume	RYG_F50184	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	Digital Balance	RYG_EN0001	20-Feb-25	20-Feb-26	12
Ambient	Total Suspended Particulate	High Volume	RYG_F50182	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	RYG_F50178	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	RYG_F50175	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	RYG_F50292	-	-	On site Calibration
Ambient	Total Suspended Particulate	Digital Balance	RYG_EN0001	20-Feb-25	20-Feb-26	12
Stack (CEMs)	Oxides of Nitrogen	Analyzer , System calibration, Standard gas	-	-	-	-
Stack (CEMs)	Sulfur Dioxide	Analyzer , System calibration, Standard gas	-	-	-	-
Stack	Total Suspended Particulate	Console Control Unit	BKK_F50518	10-Jul-25	10-Jan-26	6
Stack	Total Suspended Particulate	Pitot Tube	BKK_F50531	10-Jul-25	10-Jan-26	6
Stack	Total Suspended Particulate	Pitot Tube	BKK_F50552	24-May-25	23-Nov-25	6
Stack	Total Suspended Particulate	Pitot Tube	BKK_F50523	10-Jul-25	10-Jan-26	6
Stack	Total Suspended Particulate	Fuel Gas Analyzer	RYG_F50465	19-Feb-25	18-Feb-26	12
Stack	Total Suspended Particulate	Fuel Gas Analyzer	RYG_F50564	25-Apr-25	24-Apr-26	12
Stack	Total Suspended Particulate	Digital Balance	RYG_EN0003	20-Feb-25	20-Feb-26	12
Noise	Leq 24 hrs	Sound Calibrator	RYG_F50213	16-Jan-25	16-Jan-26	12
Noise	Leq 24 hrs	Sound Level Meter	RYG_F50621	27-Jan-25	26-Jan-26	12
Noise	Leq 24 hrs	Sound Level Meter	RYG_F50618	21-Jan-25	20-Jan-26	12
Noise	Leq 24 hrs	Sound Level Meter	RYG_F50619	21-Jan-25	21-Jan-26	12
Noise	Leq 8 hrs	Sound Calibrator	RYG_F50213	16-Jan-25	16-Jan-26	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_F50020	21-Jan-25	21-Jan-26	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_F50017	27-Jan-25	27-Jan-26	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_F50022	19-Mar-25	19-Mar-26	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_F50024	21-Jan-25	21-Jan-26	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_F50026	27-Jan-25	27-Jan-26	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_F50016	19-Sep-24	19-Sep-25	12
Noise	Leq 8 hrs	Sound Calibrator	RYG_F50496	19-Mar-25	19-Mar-26	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_F50619	21-Jan-25	21-Jan-26	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_F50300	26-Aug-25	25-Aug-26	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_F50615	23-Dec-24	23-Dec-25	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_F50614	23-Dec-24	23-Dec-25	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_F50030	27-Jan-25	26-Jan-26	12
Noise	Leq 8 hrs	Sound Level Meter	RYG_F50433	27-Jan-25	26-Jan-26	12
Heat	Heat Stress	Heat Stress Monitor	RYG_F50230	23-Dec-24	23-Dec-25	12
Heat	Heat Stress	Heat Stress Monitor	RYG_F50231	23-Dec-24	23-Dec-25	12
Heat	Heat Stress	Heat Stress Monitor	RYG_F50224	27-Jan-25	26-Jan-26	12
Heat	Heat Stress	Heat Stress Monitor	RYG_F50223	7-Jan-25	7-Jan-26	12
Heat	Heat Stress	Heat Stress Monitor	RYG_F50221	20-Dec-24	20-Dec-25	12
Heat	Heat Stress	Heat Stress Monitor	RYG_F50230	23-Dec-24	23-Dec-25	12
Heat	Heat Stress	Heat Stress Monitor	RYG_F50226	27-Jan-25	26-Jan-26	12
Heat	Heat Stress	Heat Stress Monitor	RYG_F50224	27-Jan-25	26-Jan-26	12
Heat	Heat Stress	Heat Stress Monitor	RYG_F50359	8-Jan-25	8-Jan-26	12
Illuminance	Illuminance	Lux Meter	RYG_F50474	13-Mar-25	12-Mar-26	12
Illuminance	Illuminance	Lux Meter	RYG_F50538	18-Aug-25	17-Aug-26	12
Rayong Lab	Temperature	pH meter	RYG_F50574	1-Apr-25	1-Apr-26	12



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Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Rayong Lab	pH at 25 °C	pH Meter	RYG_EN0152	18-Jun-25	18-Dec-26	18
Rayong Lab	Total Suspended Solids	Electronic Balance	RYG_EN0163	20-Feb-25	20-Feb-26	12
Rayong Lab	Total Suspended Solids	Chamber (Oven)	RYG_EN0012	10-Sep-25	10-Mar-27	18
Rayong Lab	Total Dissolved Solids 180°C	Electronic Balance	RYG_EN0163	20-Feb-25	20-Feb-26	12
Rayong Lab	Total Dissolved Solids 180°C	Chamber (Oven)	RYG_EN0012	10-Sep-25	10-Mar-27	18
Rayong Lab	BOD	DO meter with Sensor	RYG_EN0032	20-Jan-25	20-Jul-26	18
Rayong Lab	BOD	Incubator	RYG_EN0154	1-Nov-24	1-May-26	18
Rayong Lab	BOD	Burette	RYG_EN0216	18-Sep-25	18-Sep-26	12
Rayong Lab	Oil & Grease	Electronic Balance	RYG_EN0003	20-Feb-25	20-Feb-26	12
Rayong Lab	Oil & Grease	Liquid Bath (Water)	RYG_EN0220	19-Dec-24	19-Dec-25	12
Rayong Lab	Dissolved Oxygen	Chamber (Cold Room)	RYG_EN0184	11-Jun-24	11-Dec-25	18
Rayong Lab	Color (at Original pH)	Spectrophotometer	RYG_EN0037	18-Mar-25	18-Sep-26	18
Rayong Lab	Color (at pH 7.0)	Spectrophotometer	RYG_EN0037	18-Mar-25	18-Sep-26	18
Rayong Lab	COD	Spectrophotometer	RYG_EN0037	18-Mar-25	18-Sep-26	18
Rayong Lab	Chloride	pH Meter	RYG_EN0152	18-Jun-25	18-Dec-26	18
Rayong Lab	Cyanide	Spectrophotometer	RYG_EN0037	18-Mar-25	18-Sep-26	18
Rayong Lab	Formaldehyde	Spectrophotometer	RYG_EN0037	18-Mar-25	18-Sep-26	18
Rayong Lab	Phenol	Spectrophotometer	RYG_EN0037	18-Mar-25	18-Sep-26	18
Rayong Lab	Sulfide	Chamber (Cold Room)	RYG_EN0184	11-Jun-24	11-Dec-25	18
Rayong Lab	Fluoride	pH Meter	RYG_EN0152	18-Jun-25	18-Dec-26	18
Rayong Lab	Total Kjeldahl Nitrogen	Block Digestion Unit	RYG_EN0188	10-Sep-25	10-Mar-27	18
Rayong Lab	Total Kjeldahl Nitrogen	pH Meter	RYG_EN0152	18-Jun-25	18-Dec-26	18
Rayong Lab	Dissolved Oxygen (on site)	DO Meter	RYG_F50547	13-Aug-25	13-Aug-26	12
Water Lab	Calcium	ICP-OES	BKK_EL0037	22-Sep-24	23-Mar-26	18
Water Lab	Calcium	Hot Block	BKK_EL0054	4-Mar-25	4-Sep-26	18
Water Lab	Calcium	Chamber (Cooling Room)	BKK_EN0167	4-Jun-25	4-Dec-26	18
Water Lab	Magnesium	ICP-OES	BKK_EL0037	22-Sep-24	23-Mar-26	18
Water Lab	Magnesium	Hot Block	BKK_EL0054	4-Mar-25	4-Sep-26	18
Water Lab	Magnesium	Chamber (Cooling Room)	BKK_EN0167	4-Jun-25	4-Dec-26	18
Water Lab	Sodium	ICP-OES	BKK_EL0037	22-Sep-24	23-Mar-26	18
Water Lab	Sodium	Hot Block	BKK_EL0054	4-Mar-25	4-Sep-26	18
Water Lab	Sodium	Chamber (Cooling Room)	BKK_EN0167	4-Jun-25	4-Dec-26	18
Water Lab	SAR	ICP-OES	BKK_EL0037	22-Sep-24	23-Mar-26	18
Water Lab	SAR	Hot Block	BKK_EL0054	4-Mar-25	4-Sep-26	18
Water Lab	SAR	Chamber (Cooling Room)	BKK_EN0167	4-Jun-25	4-Dec-26	18
Water Lab	Chlorite	Ion Chromatography	BKK_EN0069	24-Jun-25	24-Jun-26	12
Water Lab	Organochlorine Pesticide	GC MSMS	BKK_EN0284	21-Nov-24	21-May-26	18
Water Lab	Anionic Surfactant	Spectrophotometer	BKK_EN0356	8-Oct-25	8-Oct-26	12
Water Lab	Anionic Surfactant	Chamber (Cooling Room)	BKK_EN0167	4-Jun-25	4-Dec-26	18
Water Lab	Hexavalent Chromium	Spectrophotometer	BKK_EN0356	8-Oct-25	8-Oct-26	12
Water Lab	Silver	ICP-MS	BKK_EL0043	3-Oct-25	2-Oct-26	12
Water Lab	Silver	Hot Block	BKK_EL0054	4-Mar-25	4-Sep-26	18
Water Lab	Silver	Chamber (Cooling Room)	BKK_EN0167	4-Jun-25	4-Dec-26	18
Water Lab	Barium	ICP-MS	BKK_EL0043	3-Oct-25	2-Oct-26	12
Water Lab	Barium	Hot Block	BKK_EL0054	4-Mar-25	4-Sep-26	18
Water Lab	Barium	Chamber (Cooling Room)	BKK_EN0167	4-Jun-25	4-Dec-26	18
Water Lab	Lead	ICP-MS	BKK_EL0043	3-Oct-25	2-Oct-26	12
Water Lab	Lead	Hot Block	BKK_EL0054	4-Mar-25	4-Sep-26	18
Water Lab	Lead	Chamber (Cooling Room)	BKK_EN0167	4-Jun-25	4-Dec-26	18
Water Lab	Iron	ICP-MS	BKK_EL0043	3-Oct-25	2-Oct-26	12
Water Lab	Iron	Hot Block	BKK_EL0054	4-Mar-25	4-Sep-26	18
Water Lab	Iron	Chamber (Cooling Room)	BKK_EN0167	4-Jun-25	4-Dec-26	18
Water Lab	Manganese	ICP-MS	BKK_EL0043	3-Oct-25	2-Oct-26	12
Water Lab	Manganese	Hot Block	BKK_EL0054	4-Mar-25	4-Sep-26	18
Water Lab	Manganese	Chamber (Cooling Room)	BKK_EN0167	4-Jun-25	4-Dec-26	18
Water Lab	Copper	ICP-MS	BKK_EL0043	3-Oct-25	2-Oct-26	12
Water Lab	Copper	Hot Block	BKK_EL0054	4-Mar-25	4-Sep-26	18
Water Lab	Copper	Chamber (Cooling Room)	BKK_EN0167	4-Jun-25	4-Dec-26	18
Water Lab	Nickel	ICP-MS	BKK_EL0043	3-Oct-25	2-Oct-26	12
Water Lab	Nickel	Hot Block	BKK_EL0054	4-Mar-25	4-Sep-26	18
Water Lab	Nickel	Chamber (Cooling Room)	BKK_EN0167	4-Jun-25	4-Dec-26	18



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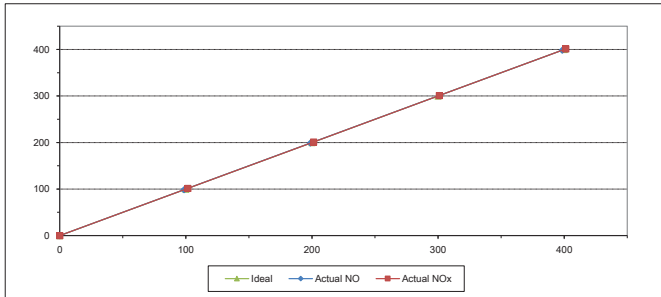
Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Water Lab	Arsenic	ICP-MS	BKK_EL0043	3-Oct-25	2-Oct-26	12
Water Lab	Arsenic	Hot Block	BKK_EL0054	4-Mar-25	4-Sep-26	18
Water Lab	Arsenic	Chamber (Cooling Room)	BKK_EN0167	4-Jun-25	4-Dec-26	18
Water Lab	Selenium	ICP-MS	BKK_EL0043	3-Oct-25	2-Oct-26	12
Water Lab	Selenium	Hot Block	BKK_EL0054	4-Mar-25	4-Sep-26	18
Water Lab	Selenium	Chamber (Cooling Room)	BKK_EN0167	4-Jun-25	4-Dec-26	18
Water Lab	Cadmium	ICP-MS	BKK_EL0043	3-Oct-25	2-Oct-26	12
Water Lab	Cadmium	Hot Block	BKK_EL0054	4-Mar-25	4-Sep-26	18
Water Lab	Cadmium	Chamber (Cooling Room)	BKK_EN0167	4-Jun-25	4-Dec-26	18
Water Lab	Zinc	ICP-MS	BKK_EL0043	3-Oct-25	2-Oct-26	12
Water Lab	Zinc	Hot Block	BKK_EL0054	4-Mar-25	4-Sep-26	18
Water Lab	Zinc	Chamber (Cooling Room)	BKK_EN0167	4-Jun-25	4-Dec-26	18
Water Lab	Trivalent Chromium	ICP-MS	BKK_EL0043	3-Oct-25	2-Oct-26	12
Water Lab	Trivalent Chromium	Hot Block	BKK_EL0054	4-Mar-25	4-Sep-26	18
Water Lab	Trivalent Chromium	Chamber (Cooling Room)	BKK_EN0167	4-Jun-25	4-Dec-26	18
Water Lab	Mercury	DUO-CVAFS / CVAAS	BKK_EL0023	12-Dec-24	12-Jun-26	18



MULTIPOINT CALIBRATION REPORT

Calibration Date	3-Jul-25	Equipment Name	NOx Analyzer
Manufacturer	HORIBA	Model	APNA-370
Serial No.	ALP0V0WY	Equipment ID	RYG_FS0455
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	55.88	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS						
	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Error NOx	%Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10	0.10
1	100.00	98.60	-1.40	-1.40	101.60	1.60	1.60
2	200.00	198.80	-1.20	-0.60	201.30	1.30	0.65
3	300.00	301.30	1.30	0.43	301.00	1.00	0.33
4	400.00	398.50	-1.50	-0.38	401.30	1.30	0.33
AVERAGE (%)				-0.37			0.60



Calibrated By

(Mr.Jirawut Sakam)
Field Environmental Scientist (3)

Approved By

(Mr.Sarayuth Jitranont)
Assistant General Manager

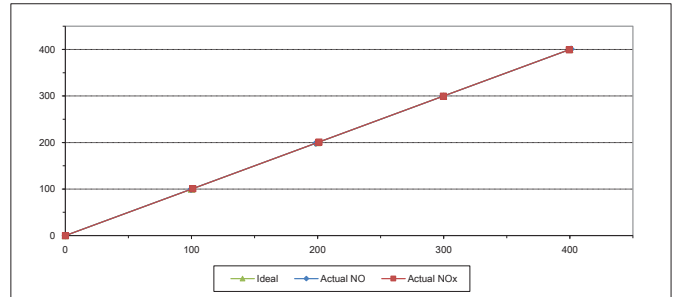
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MULTIPOINT CALIBRATION REPORT

Calibration Date	2-Jul-25	Equipment Name	NOx Analyzer
Manufacturer	HORIBA	Model	APNA-370
Serial No.	H73KYD1M	Equipment ID	BKK_FS0797
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	55.88	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS						
	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Error NOx	%Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10	0.10
1	100.00	99.70	-0.30	-0.30	101.00	1.00	1.00
2	200.00	198.60	-1.40	-0.70	201.10	1.10	0.55
3	300.00	299.10	-0.90	-0.30	299.70	-0.30	-0.10
4	400.00	401.10	1.10	0.28	399.50	-0.50	-0.13
AVERAGE (%)				-0.18			0.28



Calibrated By

(Mr.Jirawut Sakam)
Field Environmental Scientist (3)

Approved By

(Mr.Sarayuth Jitranont)
Assistant General Manager

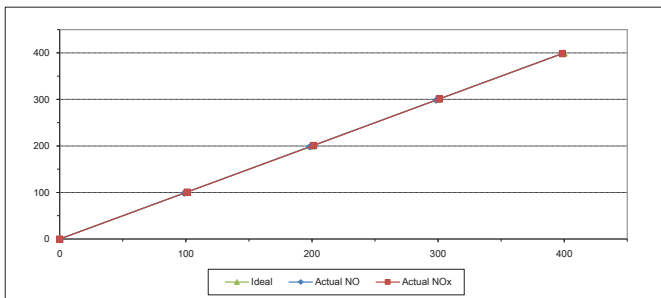
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MULTIPOINT CALIBRATION REPORT

Calibration Date	1-Jul-25	Equipment Name	NOx Analyzer
Manufacturer	Teledyne API	Model	T200
Serial No.	2198	Equipment ID	RYG_FS0252
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	55.88	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS						
	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Error NOx	%Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10	0.10
1	100.00	98.70	-1.30	-1.30	101.00	1.00	1.00
2	200.00	198.20	-1.80	-0.90	201.30	1.30	0.65
3	300.00	298.50	-1.50	-0.50	301.00	1.00	0.33
4	400.00	398.90	-1.10	-0.28	398.60	-1.40	-0.35
AVERAGE (%)				-0.58			0.35



Calibrated By

(Mr.Jirawut Sakam)
Field Environmental Scientist (3)

Approved By

(Mr.Sarayuth Jitranont)
Assistant General Manager

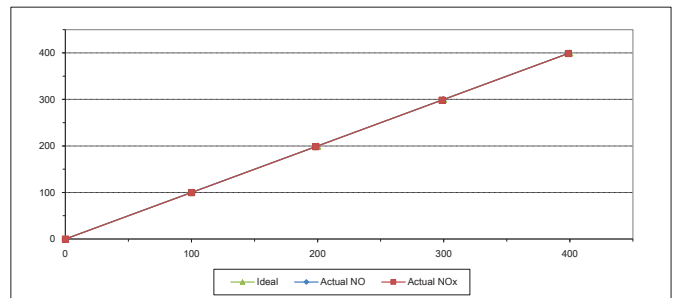
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MULTIPOINT CALIBRATION REPORT

Calibration Date	1-Jul-25	Equipment Name	NOx Analyzer
Manufacturer	Teledyne API	Model	T200
Serial No.	2197	Equipment ID	RYG_FS0255
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	55.88	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS						
	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	Error NOx	%Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10	0.10
1	100.00	99.60	-0.40	-0.40	100.10	0.10	0.10
2	200.00	198.10	-1.90	-0.95	198.70	-1.30	-0.65
3	300.00	299.30	-0.70	-0.23	298.70	-1.30	-0.43
4	400.00	398.40	-1.60	-0.40	398.80	-1.20	-0.30
AVERAGE (%)				-0.38			-0.24



Calibrated By

(Mr.Jirawut Sakam)
Field Environmental Scientist (3)

Approved By

(Mr.Sarayuth Jitranont)
Assistant General Manager

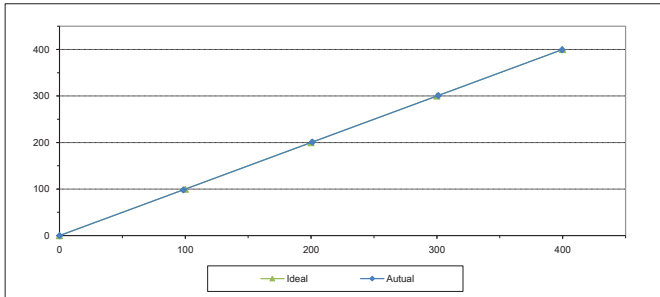
ALS Laboratory Group
FORM NO.: F 06-056 REVISION NO.: - ISSUE DATE: 02/04/12



MULTIPOINT CALIBRATION REPORT

Calibration Date	2-Jul-25	Equipment Name	SO2 Analyzer
Manufacturer	HORIBA	Model	APSA-370
Serial No.	H0S3D9FA	Equipment ID	RYG_FS0454
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	58.3	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS			
	Ideal	Actual	Error	%Error
ZERO	0.00	0.10	0.10	0.10
1	100.00	98.50	-1.50	-1.50
2	200.00	201.00	1.00	0.50
3	300.00	301.20	1.20	0.40
4	400.00	399.50	-0.50	-0.13
AVERAGE (%)				-0.13



Calibrated By

(Mr. Jirawut Sakam)
Field Environmental Scientist (3)

Approved By

(Mr. Sarayuth Jittrantorn)
Assistant General Manager

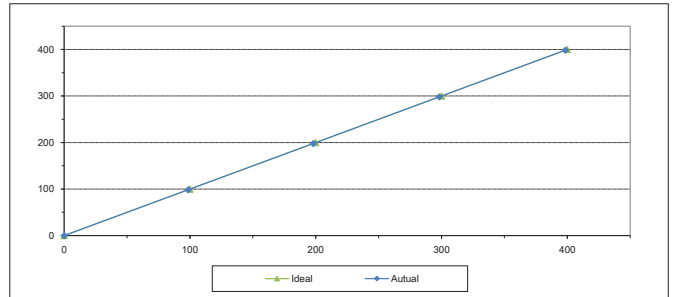
ALS Laboratory Group
FORM NO.: F 06-056 REVISION NO.: - ISSUE DATE: 02/04/12



MULTIPOINT CALIBRATION REPORT

Calibration Date	1-Jul-25	Equipment Name	SO2 Analyzer
Manufacturer	HORIBA	Model	APSA-370
Serial No.	G2CH436B	Equipment ID	BKK_FS0796
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	58.3	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS			
	Ideal	Actual	Error	%Error
ZERO	0.00	0.05	0.05	0.05
1	100.00	98.70	-1.30	-1.30
2	200.00	198.10	-1.90	-0.95
3	300.00	298.30	-1.70	-0.57
4	400.00	398.50	-1.50	-0.38
AVERAGE (%)				-0.63



Calibrated By

(Mr. Jirawut Sakam)
Field Environmental Scientist (3)

Approved By

(Mr. Sarayuth Jittrantorn)
Assistant General Manager

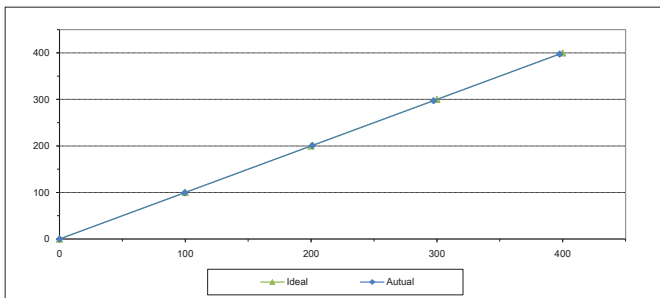
ALS Laboratory Group
FORM NO.: F 06-056 REVISION NO.: - ISSUE DATE: 02/04/12



MULTIPOINT CALIBRATION REPORT

Calibration Date	2-Jul-25	Equipment Name	SO2 Analyzer
Manufacturer	Teledyne API	Model	T100
Serial No.	1773	Equipment ID	RYG_FS0251
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	58.3	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS			
	Ideal	Actual	Error	%Error
ZERO	0.00	0.10	0.10	0.10
1	100.00	99.60	-0.40	-0.40
2	200.00	201.00	1.00	0.50
3	300.00	297.30	-2.70	-0.90
4	400.00	397.50	-2.50	-0.63
AVERAGE (%)				-0.27



Calibrated By

(Mr. Jirawut Sakam)
Field Environmental Scientist (3)

Approved By

(Mr. Sarayuth Jittrantorn)
Assistant General Manager

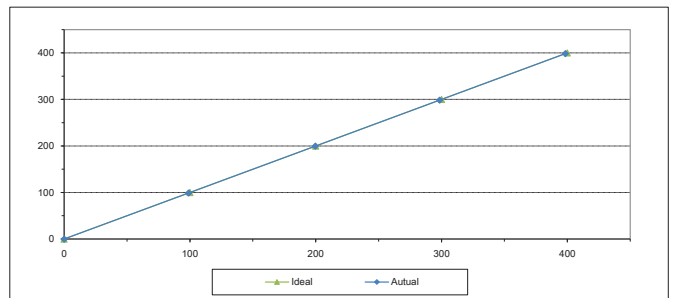
ALS Laboratory Group
FORM NO.: F 06-056 REVISION NO.: - ISSUE DATE: 02/04/12



MULTIPOINT CALIBRATION REPORT

Calibration Date	2-Jul-25	Equipment Name	SO2 Analyzer
Manufacturer	Teledyne API	Model	T100
Serial No.	1772	Equipment ID	RYG_FS0254
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	58.3	Cylinder No.	GN0027222
Cylinder Pressure (psi)	1800	Certified By	Airgas Inc.
Certified Date	9-Feb-22	Expired Date	9-Feb-30

Point	CALIBRATION RESULTS			
	Ideal	Actual	Error	%Error
ZERO	0.00	0.05	0.05	0.05
1	100.00	99.00	-1.00	-1.00
2	200.00	199.60	-0.40	-0.20
3	300.00	298.50	-1.50	-0.50
4	400.00	398.50	-1.50	-0.38
AVERAGE (%)				-0.41



Calibrated By

(Mr. Jirawut Sakam)
Field Environmental Scientist (3)

Approved By

(Mr. Sarayuth Jittrantorn)
Assistant General Manager

ALS Laboratory Group
FORM NO.: F 06-056 REVISION NO.: - ISSUE DATE: 02/04/12

CERTIFICATE OF CALIBRATION

Page 1 of 2 Pages

MEASUREMENT ITEM : Cup anemometer
MANUFACTURER : Novalyx
MODEL/TYPE : Sensor: WS-02F
Data logger: 300-WS-25DL
SERIAL NUMBER : Sensor: WSD-A4987
Data logger: A4987
ID NUMBER : RYG_F50089
CONDITION AS-RECEIVED : Used item
CUSTOMER : ALS laboratory group (Thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Suan Luang,
Khet Suan Luang, Bangkok 10250 Thailand.

RECEIVED DATE : 30 Sep 2024
MEASUREMENT DATE : 07 Oct 2024
ISSUE DATE : 07 Oct 2024

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:
Temperature : 23.0 ± 3.0 °C
Relative Humidity : 55.0 ± 15.0 %RH
Atmospheric Pressure : 1010hPa

PLACE OF CALIBRATION : Eiffel-type wind tunnel of Jiranatee Associates Co., Ltd.

CALIBRATION CONDITIONS : Wind tunnel cross-section area¹ : 900 cm²
Wind direction frontal area² : 100 cm²
Diameter of mounting pipe³ : - mm
Blockage ratio of test object⁴ : 0.113 [-]

Preconditioning : 24 hours at ambient conditions.

Measurement Condition : The average values during measurement are (23.0) °C, (42.6) %RH and (1009.5) hPa.

TABULATION OF RESULTS:
The table on next page give the measured values.

Calibrated by:
☒ Mr. Sorawit Thachalad
☐ Miss Jittraphorn Lertsomphol



Approved signatory:

Mr. Parinya Booncharoen
Calibration Department Manager

REVIEW BY: *Parinya P.*
APPROVED BY: *[Signature]*
NEXT CAL. DATE: 7/4/26

Remark:
¹ Nozzle cross-section area of the wind tunnel
² Projected cross-section area of the tested object include mounting pipe
³ Diameter of mounting pipe
⁴ Ratio $\frac{A}{A_0}$

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

Page 2 of 2 Pages

MEASUREMENT RESULTS¹

The Cup anemometer, Unit Under Calibration (UUC) was exercise at 10 m/s for 5 minutes prior to calibration being performed. The standard air velocity 0.5 m/s to 5 m/s was calculated by a standard air velocity transducer which was installed 50 mm away from wind tunnel nozzle and installed 40 mm away from top of the test section and the standard air velocity 5 m/s to 30 m/s was calculated by a pitot tube with precision differential pressure meter which was installed 50 mm away from wind tunnel nozzle and installed 40 mm away from top of the test section. UUC was mounted on a round vertical tube of the lower plane at center of test section. The calibration was carried out under both rising and falling air velocity in the range of 1 m/s to 16 m/s at calibration interval of 1 m/s. The results of calibration and associated measurement uncertainties are reported in the table below.

V_{std} [m/s]	Temp. wind tunnel [°C]	Temp. room [°C]	V_{std} [m/s]	Error [m/s]	$U(B=2)$ [m/s]
1.002	22.94	23.00	0.9	-0.1	0.31
2.223	23.12	23.00	2.0	-0.2	0.31
3.093	22.82	23.00	3.0	-0.1	0.31
4.236	22.84	23.00	4.0	-0.2	0.31
4.95	22.96	23.00	5.0	0.0	0.31
5.96	22.86	23.00	6.0	0.1	0.31
7.03	22.84	23.00	7.0	0.0	0.31
7.96	22.92	23.00	8.0	0.0	0.31
8.97	22.60	23.00	9.2	0.2	0.31
9.96	22.70	23.00	10.1	0.2	0.31
11.09	22.72	23.00	11.1	0.2	0.31
12.02	22.70	23.00	12.2	0.2	0.31
12.94	22.84	23.00	13.3	0.3	0.31
13.92	22.80	23.00	14.3	0.4	0.31
14.99	22.90	23.00	15.3	0.3	0.31
15.96	22.90	23.00	16.2	0.2	0.35

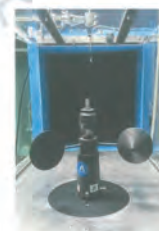
Remark:

¹ Calibration results only count for the tested circumstances and environmental conditions during which calibration took place

² Velocity of standard

³ Velocity of Unit Under Calibration

PHOTO OF CALIBRATION SET-UP



Calibration set-up of the Cup anemometer calibration in the wind tunnel of Jiranatee Associates Co., Ltd. The Cup anemometer shown may differ from the calibrated one. Remark: The proportion of the set-up is not true to scale due to imaging geometry.

End of Certificate of Calibration
J NAC
JIRANATEE ASSOCIATES CO., LTD.

CERTIFICATE OF CALIBRATION

Page 1 of 2 Pages

MEASUREMENT ITEM : Wind Direction Sensor
MANUFACTURER : Novalyx
MODEL/TYPE : Sensor: WS-02F
Data logger: 300-WS-25DL
SERIAL NUMBER : Sensor: WSD-A4987
Data logger: A4987
ID NUMBER : RYG_F50089
CONDITION AS-RECEIVED : Used item
CUSTOMER : ALS laboratory group (Thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Suan Luang,
Khet Suan Luang, Bangkok 10250 Thailand.

RECEIVED DATE : 30 Sep 2024
MEASUREMENT DATE : 07 Oct 2024
ISSUE DATE : 07 Oct 2024

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:
Temperature : 23.0 ± 3.0 °C
Relative Humidity : 55.0 ± 15.0 %RH
Atmospheric Pressure : 1010hPa

PLACE OF CALIBRATION : Eiffel-type wind tunnel of Jiranatee Associates Co., Ltd.

CALIBRATION CONDITION : Wind tunnel cross-section area¹ : 900 cm²
Wind direction frontal area² : 129 cm²
Diameter of mounting pipe³ : - mm
Blockage ratio of test object⁴ : 0.143 [-]

Preconditioning : 24 hours at ambient conditions.

Measurement Condition : The average values during measurement are (23.3) °C, (46.1) %RH and (1007.5) hPa.

TABULATION OF RESULTS:
The table on next page give the measured values.

Calibrated by:
☒ Mr. Sorawit Thachalad
☐ Miss Jittraphorn Lertsomphol



Approved signatory:

Mr. Parinya Booncharoen
Calibration Department Manager

Calibration procedure:
The wind direction sensor was calibrated against Standard Rotary Encoder model A4900751 DM04-P3-S-UD in an close test-section of Eiffel-type wind tunnel with 900 cm² cross test-section area. The WS-CL-008 fitted on IEC-63400-12-1, Wind energy generation system, - Part 12-1: Power performance measurements of electricity producing wind turbines, March 2017 was used as a calibration guideline.

Traceability:

This certificate provides a traceability of the measurement to recognized the national standards, and to realization of the international system of units (SI) through the NMVT (National Metrology Institute of Thailand) via Certificate number: DA-0036-23.

Uncertainty of Measurement:

The reported uncertainty of measurement is based on the standard uncertainty multiplied by a coverage factor $k=2$, Which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty has been determined in accordance with the GUM (Evaluation of measurement data - Guide to the expression of uncertainty in measurement)

Remark:
¹ Nozzle cross-section area of the wind tunnel
² Projected cross-section area of the tested object include mounting pipe
³ Diameter of mounting pipe
⁴ Ratio $\frac{A}{A_0}$

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

Page 2 of 2 Pages

MEASUREMENT RESULTS¹

The wind direction sensor was calibrated against standard rotary encoder by comparison method. During calibration, the measurement was carried out at 45° intervals in clockwise and counterclockwise directions after adjustement has been made. The flow speed of wind tunnel (usually 5 m/s) is kept constant while the sensor is rotated around its vertical axis. The results of calibration and associated measurement uncertainties are reported in the table below.

Air speed m/s	D^{+45} Degree (°)	D^{-45} Degree (°)	Error Degree (°)	$U(B=2)$ Degree (°)
	0.000	0	0	0.80
	45.000	42	-3	0.80
	90.000	88	-2	0.80
	135.000	134	-1	0.80
5.04	180.000	180	0	0.80
	225.000	228	3	0.80
	270.000	274	4	0.80
	315.000	317	2	0.80

Remark:

¹ Calibration results only count for the tested circumstances and environmental conditions during which calibration took place

² Direction of standard

³ Direction of Unit Under Calibration

End of Certificate of Calibration
J NAC
JIRANATEE ASSOCIATES CO., LTD.

CERTIFICATE OF CALIBRATION

Page 1 of 2 Pages

MEASUREMENT ITEM : Cup anemometer
MANUFACTURER : Novalyx
MODEL/TYPE : Sensor: WS-02F
Data logger: 200 WS-25LB
SERIAL NUMBER : Sensor: WSD-AS190
Data logger: AS190
ID NUMBER : RVG_550329
CONDITION AS-RECEIVED : Used item
CUSTOMER : AIS laboratory group (Thailand) Co., Ltd.
104 Phatthanakan Rd, Phatthanakan Rd, Khwaeng Suan Luang,
Khet Suan Luang, Bangkok 10250 Thailand.

RECEIVED DATE : 18 Apr 2025
MEASUREMENT DATE : 07 May 2025
ISSUE DATE : 09 May 2025

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:

Temperature : 23.0 ± 3.0 °C
Relative Humidity : 55.0 ± 15.0 %RH
Atmospheric Pressure : 1010 ± 30 hPa

PLACE OF CALIBRATION

: Eiffel-type wind tunnel of Jirantee Associates Co., Ltd.

CALIBRATION CONDITIONS

Wind tunnel cross-section area¹ : 900 cm²
Cup anemometer frontal area² : 100 cm²
Diameter of mounting pipe³ : mm
Blockage ratio of test object⁴ : 0.111 [-]

Preconditioning

Measurement Condition

: 24 hours at ambient conditions.
The average values during measurement are (24.3) °C, (41.2) %RH and (1008.7) hPa

TABULATION OF RESULTS:

The table on next page give the measured values.

Calibrated by:

□ Mr. Somrat Thirakul
□ Miss Jittaporn Lertkarnchit



Approved signature:

Mr. Parinya Booncharoen
Calibration Department Manager

REVIEW BY: S.T.S.

APPROVED BY: S.T.S.

NEXT CAL DATE: 06/11/2026

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

Calibration procedure:
The Cup anemometer was calibrated against Standard air velocity transducer (type: B55-02) and pitot tube with precision differential pressure meter model: DP42500 in an edge test-section of Eiffel-type wind tunnel with 300 cm² cross test section area. The W-C-007 based on IEC 61400-12-1, Wind energy generator systems - Part 12-1: Power performance measurements of electricity producing wind turbines, March 2017 was used as a calibration guideline.

Traceability:

This certificate provides a traceability of the measurement to recognized the national standards and to realization of the international system of units (SI) through the NIMT (National Metrology Institute of Thailand) via Certificate number: MW-0019-25 and MW-0055-24

Uncertainty of Measurement:

The reported uncertainty of measurement is based on the standard uncertainty multiplied by a coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty has been determined in accordance with the GUM (Evaluation of measurement data - Guide to the expression of uncertainty in measurement).

Page 2 of 2 Pages

MEASUREMENT RESULTS⁵

The Cup anemometer, Unit Under Calibration (UUC) was exercise at 10 m/s for 5 minutes prior to calibration being performed. The standard air velocity 0.5 m/s to 5 m/s was calculated by a standard air velocity transducer which was installed 50 mm away from wind tunnel nozzle and installed 40 mm away from top of the test section and the standard air velocity 5 m/s to 30 m/s was calculated by a pitot tube with precision differential pressure meter which was installed 50 mm away from wind tunnel nozzle and installed 40 mm away from top of the test section. UUC was mounted on a round vertical tube of the lower plate at center of test section. The calibration was carried out under both rising and falling air velocity in the range of 1 m/s to 16 m/s at calibration interval of 1 m/s. The results of calibration and associated measurement uncertainties are reported in the table below.

v_{ref} (m/s)	Temp. wind tunnel (°C)	Temp. room (°C)	v_{ref} (m/s)	Error (m/s)	U (k=2) (m/s)
1.018	24.30	24.30	0.6	-0.2	0.31
2.313	24.70	24.30	2.0	-0.3	0.31
3.080	24.50	24.30	3.0	-0.1	0.31
4.378	24.46	24.30	4.0	-0.3	0.31
4.95	24.66	24.30	5.0	0.1	0.31
5.96	24.96	24.30	6.3	0.1	0.31
7.02	24.50	24.30	7.1	0.1	0.31
7.96	24.62	24.30	8.1	0.2	0.31
9.04	24.52	24.30	9.2	0.1	0.31
10.00	24.38	24.30	10.2	0.2	0.31
10.98	24.50	24.30	11.1	0.2	0.31
11.98	24.20	24.30	12.3	0.3	0.31
12.97	24.58	24.30	13.3	0.3	0.31
14.00	24.30	24.30	14.3	0.3	0.34
14.99	24.50	24.30	15.3	0.3	0.31
15.99	24.38	24.30	16.4	0.4	0.35

Remark:

⁵ Calibration results only count for the tested circumstances and environmental conditions during which calibration took place.

⁶ Velocity of standard

⁷ Velocity of Unit Under Calibration

PHOTO OF CALIBRATION SET-UP



Calibration set-up of the Cup anemometer calibration in the wind tunnel of Jirantee Associates Co., Ltd. The Cup anemometer shown may differ from the calibrated one. Remark: The proportion of the set-up is not true to scale due to imaging geometry.



CERTIFICATE OF CALIBRATION

Page 1 of 2 Pages

MEASUREMENT ITEM : Wind Direction Sensor
MANUFACTURER : Novalyx
MODEL/TYPE : Sensor: WS-02F
Data logger: 200 WS-25LB
SERIAL NUMBER : Sensor: WSD-AS190
Data logger: AS190
ID NUMBER : RVG_550329
CONDITION AS-RECEIVED : Used item
CUSTOMER : AIS laboratory group (Thailand) Co., Ltd.
104 Phatthanakan Rd, Phatthanakan Rd, Khwaeng Suan Luang,
Khet Suan Luang, Bangkok 10250 Thailand.

RECEIVED DATE : 18 Apr 2025
MEASUREMENT DATE : 07 May 2025
ISSUE DATE : 09 May 2025

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:

Temperature : 23.0 ± 3.0 °C
Relative Humidity : 55.0 ± 15.0 %RH
Atmospheric Pressure : 1010 ± 30 hPa

PLACE OF CALIBRATION

: Eiffel-type wind tunnel of Jirantee Associates Co., Ltd.

CALIBRATION CONDITION

Wind tunnel cross-section area¹ : 900 cm²
Wind direction frontal area² : 125 cm²
Diameter of mounting pipe³ : mm
Blockage ratio of test object⁴ : 0.143 [-]

Preconditioning

Measurement Condition

: 24 hours at ambient conditions.
The average values during measurement are (24.4) °C, (43.6) %RH and (1010.9) hPa.

TABULATION OF RESULTS:

The table on next page give the measured values.

Calibrated by:

□ Mr. Somrat Thirakul
□ Miss Jittaporn Lertkarnchit



Approved signature:

Mr. Parinya Booncharoen
Calibration Department Manager

Remark:
¹ Nozzle cross-section area of the wind tunnel
² Projected cross-section area of the tested object include mounting pipe
³ Diameter of mounting pipe
⁴ Ratio to ¹

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

Calibration procedure:
The wind direction sensor was calibrated against Standard Rotary Encoder model: ATR800/5 DMD4-P3-S-UB in an close test-section of Eiffel-type wind tunnel with 300 cm² cross test-section area. The W-C-008 based on IEC 61400-12-1, Wind energy generator systems - Part 12-1: Power performance measurements of electricity producing wind turbines, March 2017 was used as a calibration guideline.

Traceability:

This certificate provides a traceability of the measurement to recognized the national standards and to realization of the international system of units (SI) through the NIMT (National Metrology Institute of Thailand) via Certificate number: DA-0021-24.

Uncertainty of Measurement:

The reported uncertainty of measurement is based on the standard uncertainty multiplied by a coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%. The standard uncertainty has been determined in accordance with the GUM (Evaluation of measurement data - Guide to the expression of uncertainty in measurement).

Page 2 of 2 Pages

MEASUREMENT RESULTS⁵

The wind direction sensor was calibrated against standard rotary encoder by comparison method. During calibration, the measurement was carried out at 45° intervals in clockwise and counterclockwise directions after offset adjustment has been made. The flow speed of wind tunnel (usually 5 m/s) is kept constant while the sensor is rotated around its vertical axis. The results of calibration and associated measurement uncertainties are reported in the table below.

Air speed m/s	D^{ref} Degree (°)	D^{ref} Degree (°)	Error Degree (°)	U (k=2) Degree (°)
	45.000	41	-4	0.80
	90.000	87	-3	0.80
	135.000	132	-3	0.80
5.01	180.001	178	-2	0.80
	225.000	226	1	0.80
	270.000	273	3	0.80
	315.000	320	5	0.80
	360.000	359	-1	0.80

Remark:

⁵ Calibration results only count for the tested circumstances and environmental conditions during which calibration took place.

⁶ Direction of standard

⁷ Direction of Unit Under Calibration

End of Certificate of Calibration





Certificate Number

CWS-052-67

CERTIFICATE OF CALIBRATION

Page 1 of 2 Pages

MEASUREMENT ITEM

Cup anemometer

MANUFACTURER

Novatex

MODEL/TYPE

Sensor: WS-02F

SERIAL NUMBER

Data logger: 200-WS-25DL

ID NUMBER

Sensor: WSD-A4986

CONDITION AS-RECEIVED

Data logger: A4986

CUSTOMER

RYG JS0087

RECEIVED DATE

30 Sep 2024

MEASUREMENT DATE

07 Oct 2024

ISSUE DATE

07 Oct 2024

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:

Temperature

23.0 ± 3.0 °C

Relative Humidity

55.0 ± 15.0 %RH

Atmospheric Pressure

1010 ± 10 hPa

PLACE OF CALIBRATION

Eiffel-type wind tunnel of Jiranatee Associates Co., Ltd.

CALIBRATION CONDITIONS

Wind tunnel cross-section area¹

900 cm²

Wind direction frontal area²

100 cm²

Diameter of mounting pipe³

mm

Blockage ratio of test object⁴

0.111 [-]

Preconditioning

24 hours at ambient conditions.

Measurement Condition

The average values during measurement are (23.3) °C, (40.9) %RH and (1010.3) hPa.

TABULATION OF RESULTS:

The table on next page give the measured values.

Calibrated by:

Mr. Sorawit Thirakulad

Miss Jittaporn Lerttongphol



Approved signatory:

Mr. Parinya Booncharoen

Calibration Department Manager

Remarks:

¹ Nozzle cross-section area of the wind tunnel

² Projected cross-section area of the tested object include mounting pipe

³ Diameter of mounting pipe

⁴ Ratio "a"/"b"

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

Page 2 of 2 Pages

MEASUREMENT RESULTS⁵

The Cup anemometer, Unit Under Calibration (UUC) was exercise at 10 m/s for 5 minutes prior to calibration being performed. The standard air velocity 0.5 m/s to 5 m/s was calculated by a standard air velocity transducer which was installed 50 mm away from wind tunnel nozzle and installed 40 mm away from top of the test section and the standard air velocity 5 m/s to 30 m/s was calculated by a pitot tube with precision differential pressure meter which was installed 50 mm away from wind tunnel nozzle and installed 40 mm away from top of the test section, UUC was mounted on a round vertical tube of the lower plate at center of test section. The calibration was carried out under both rising and falling air velocity in the range of 1 m/s to 16 m/s at calibration interval of 1 m/s. The results of calibration and associated measurement uncertainties are reported in the table below.

v_{std} [m/s]	Temp. wind tunnel [°C]	Temp. room [°C]	v_{std} [m/s]	Error [m/s]	U (k=2) [m/s]
1.013	23.26	23.30	0.8	-0.2	0.31
2.237	23.24	23.30	2.0	-0.2	0.31
3.051	23.28	23.30	3.0	-0.1	0.31
4.204	23.26	23.30	4.0	-0.2	0.31
4.96	22.92	23.30	5.0	0.0	0.31
5.58	22.70	23.30	6.0	0.0	0.31
7.05	22.84	23.30	7.0	0.0	0.31
7.58	22.58	23.30	8.0	0.0	0.31
8.97	23.00	23.30	9.0	0.0	0.31
9.97	22.96	23.30	10.1	0.1	0.31
11.03	23.10	23.30	11.2	0.2	0.31
12.05	23.34	23.30	12.1	0.1	0.33
12.95	23.20	23.30	13.2	0.2	0.32
13.93	23.04	23.30	14.2	0.3	0.34
14.98	23.20	23.30	15.2	0.2	0.37
15.91	23.14	23.30	16.2	0.3	0.31

Remarks:

⁵ Calibration results only count for the tested circumstances and environmental conditions during which calibration took place

⁶ Velocity of standard

⁷ Velocity of Unit Under Calibration

PHOTO OF CALIBRATION SET-UP



Calibration set-up of the Cup anemometer calibration in the wind tunnel of Jiranatee Associates Co., Ltd. The Cup anemometer shown may differ from the calibrated one. Remark: The proportion of the set-up is not true to scale due to imaging geometry.



Certificate Number

CWD-052-67

CERTIFICATE OF CALIBRATION

Page 1 of 2 Pages

MEASUREMENT ITEM

Wind Direction Sensor

MANUFACTURER

Novatex

MODEL/TYPE

Sensor: WS-02F

SERIAL NUMBER

Data logger: 200-WS-25DL

ID NUMBER

Sensor: WSD-A4986

CONDITION AS-RECEIVED

RYG JS0087

CUSTOMER

Used item

RECEIVED DATE

30 Sep 2024

MEASUREMENT DATE

07 Oct 2024

ISSUE DATE

07 Oct 2024

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:

Temperature

23.0 ± 3.0 °C

Relative Humidity

55.0 ± 15.0 %RH

Atmospheric Pressure

1010 ± 10 hPa

PLACE OF CALIBRATION

Eiffel-type wind tunnel of Jiranatee Associates Co., Ltd.

CALIBRATION CONDITION

Wind tunnel cross-section area¹

900 cm²

Wind direction frontal area²

129 cm²

Diameter of mounting pipe³

mm

Blockage ratio of test object⁴

0.143 [-]

Preconditioning

24 hours at ambient conditions.

Measurement Condition

The average values during measurement are (23.3) °C, (47.2) %RH and (1007.3) hPa.

TABULATION OF RESULTS:

The table on next page give the measured values.

Calibrated by:

Mr. Sorawit Thirakulad

Miss Jittaporn Lerttongphol



Approved signatory:

Mr. Parinya Booncharoen

Calibration Department Manager

Remarks:

¹ Nozzle cross-section area of the wind tunnel

² Projected cross-section area of the tested object include mounting pipe

³ Diameter of mounting pipe

⁴ Ratio "a"/"b"

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

Page 2 of 2 Pages

MEASUREMENT RESULTS⁵

The wind direction sensor was calibrated against standard rotary encoder by comparison method. During calibration, the measurement was carried out at 45° intervals in clockwise and counter-clockwise directions after offset adjustment has been made. The flow speed of wind tunnel (usually 5 m/s) is kept constant while the sensor is rotated around its vertical axis. The results of calibration and associated measurement uncertainties are reported in the table below.

Air speed m/s	D'_{std} Degree (°)	D'_{std} Degree (°)	Error Degree (°)	U (k=2) Degree (°)
5.00	0.000	0	0	0.80
	45.000	42	-3	0.80
	90.000	37	-3	0.80
	135.000	133	-2	0.80
	180.000	178	-2	0.80
	225.000	224	-1	0.80
	270.000	273	3	0.80
	315.000	318	3	0.80

Remarks:

⁵ Calibration results only count for the tested circumstances and environmental conditions during which calibration took place

⁶ Direction of standard

⁷ Direction of Unit Under Calibration

End of Certificate of Calibration



CERTIFICATE OF CALIBRATION

Page 1 of 2 Pages

MEASUREMENT ITEM MANUFACTURER MODEL/TYPE

Cup anemometer

Novalex

Sensor: WS-02F

Data logger: 200-WS-25.3

SERIAL NUMBER

Sensor: WSD-AS376

Data logger: AS376

ID NUMBER

RYG_FS0414

CONDITION AS-RECEIVED

CUSTOMER

Used item

ALS laboratory group (Thailand) Co., Ltd.

104 Phatthanasak 40, Phatthanasak Rd, Khwaeng Suan Luang

Khet Suan Luang, Bangkok 10250 Thailand.

RECEIVED DATE

18 Oct 2024

MEASUREMENT DATE

29 Oct 2024

ISSUE DATE

29 Oct 2024

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follows:

Temperature

23.0 ± 3.0 °C

Relative Humidity

55.0 ± 15.0 %RH

Atmospheric Pressure

1010 ± 10 hPa

PLACE OF CALIBRATION

Eiffel-type wind tunnel of Jirante Associates Co., Ltd.

CALIBRATION CONDITIONS

Wind tunnel cross-section area¹

900 cm²

Wind direction frontal area²

100 cm²

Diameter of mounting pipe³

mm

Blockage ratio of test object⁴

0.111 [-]

Preconditioning

24 hours at ambient conditions.

Measurement Condition

The average values during measurement are (23.0) °C, (46.8) %RH and (1003.6) hPa.

TABULATION OF RESULTS:

The table on next page give the measured values.

Calibrated by:

Mr. Sorawat Thachalad

Miss Jitraporn Leitsomphol



Approved signatory:

Mr. Parinya Boonchanom
Calibration Department Manager

Remark:

¹ Nozzle cross-section area of the wind tunnel

² Projected cross-section area of the tested object include mounting pipe

³ Diameter of mounting pipe

⁴ Ratio "a" to "b"

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

Page 2 of 2 Pages

MEASUREMENT RESULTS⁵

The Cup anemometer, Unit Under Calibration (UUC) was exercise at 10 m/s for 5 minutes prior to calibration being performed. The standard air velocity 0.5 m/s to 5 m/s was calculated by a standard air velocity transducer which was installed 50 mm away from wind tunnel nozzle and installed 40 mm away from top of the test section and the standard air velocity 5 m/s to 30 m/s was calculated by a pitot tube with precision differential pressure meter which was installed 50 mm away from wind tunnel nozzle and installed 40 mm away from top of the test section. UUC was mounted on a round vertical tube of the lower plate at center of test section. The calibration was carried out under both rising and falling air velocity in the range of 1 m/s to 15 m/s at calibration interval of 1 m/s. The results of calibration and associated measurement uncertainties are reported in the table below.

V_{ref} [m/s]	Temp. wind tunnel [°C]	Temp. room [°C]	V_{uuc} [m/s]	Error [m/s]	U [k=2] [m/s]
1.012	22.94	22.95	0.8	-0.2	0.31
2.209	23.00	22.95	2.0	-0.2	0.31
3.050	22.78	22.95	2.9	-0.1	0.31
4.206	22.82	22.95	4.1	-0.1	0.31
4.53	22.90	22.95	5.1	0.2	0.31
5.92	22.90	22.95	6.0	0.1	0.31
7.04	22.60	22.95	7.0	-0.1	0.31
7.96	22.74	22.95	8.0	0.1	0.46
8.96	22.76	22.95	8.9	0.0	0.31
9.96	22.50	22.95	10.0	0.1	0.31
11.08	22.90	22.95	11.1	0.0	0.31
12.01	22.52	22.95	12.0	0.0	0.31
12.96	22.58	22.95	13.1	0.1	0.35
13.94	22.54	22.95	14.0	0.1	0.35
14.98	22.60	22.95	15.0	0.0	0.31
15.98	22.60	22.95	16.1	0.1	0.31

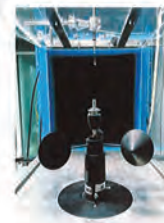
Remark:

⁵ Calibration results only count for the tested circumstances and environmental conditions during which calibration took place

⁶ Velocity of standard

⁷ Velocity of Unit Under Calibration

PHOTO OF CALIBRATION SET-UP



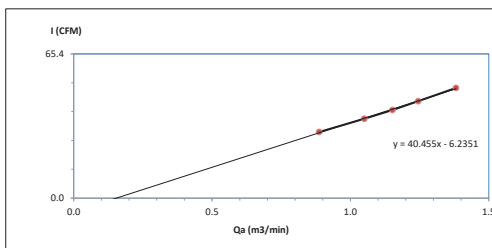
Calibration set-up of the Cup anemometer calibration in the wind tunnel of Jirante Associates Co., Ltd. The Cup anemometer shown may differ from the calibrated one. Remark: The proportion of the set-up is not true to scale due to imaging geometry.



High Volume Air Sampler Calibration Worksheet

Project Site :	Gulf TS4 Co., Ltd.	Barometric Pressure (mm Hg) :	755.3
Calibrate Location :	โรงเรียนบ้านสุทนต์	Temperature (°C) :	30.1
Calibrate Date :	20-Oct-25	High Volume ID :	RYG_FS0295
CalibrationSheet No.:	C-201025-RYG_FS0295	High Volume Model :	TE-5009X
Calibrator ID:	RYG_FS0205	High Volume S/N :	5502
Calibrator Model :	TE-5028A	Calibrator Slope :	0.95561
Calibrator S/N :	1166	Calibrator Intercept :	-0.02266

Test No.	Delta H ₂ O (inch)	Qa (m ³ /min)	I: Chart (CFM)	Linear Regression
1	1.7	0.887	30	Slope : 40.4550
2	2.4	1.050	36	Intercept : -6.2351
3	2.9	1.152	40	Correlation Coefficient : 0.9990
4	3.4	1.245	44	
5	4.2	1.381	50	



Calibrated by

(Mr. Anurak Tongkajonsakda)
RYG Field Services Scientist (2)

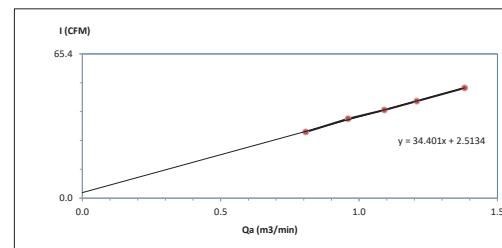
Approved by :

(Mr. Supot Salamteh)
Field Services Section Head

High Volume Air Sampler Calibration Worksheet

Project Site :	Gulf TS4 Co., Ltd.	Barometric Pressure (mm Hg) :	755.3
Calibrate Location :	โรงเรียนชุมชนบึงสีฐานตำบลระบืออวก	Temperature (°C) :	30.1
Calibrate Date :	20-Oct-25	High Volume ID :	RYG_FS0294
CalibrationSheet No.:	C-201025-RYG_FS0294	High Volume Model :	TE-5009X
Calibrator ID:	RYG_FS0205	High Volume S/N :	5501
Calibrator Model :	TE-5028A	Calibrator Slope :	0.95561
Calibrator S/N :	1166	Calibrator Intercept :	-0.02266

Test No.	Delta H ₂ O (inch)	Qa (m ³ /min)	I: Chart (CFM)	Linear Regression
1	1.4	0.807	30	Slope : 34.4011
2	2.0	0.960	36	Intercept : 2.5134
3	2.6	1.092	40	Correlation Coefficient : 0.9994
4	3.2	1.209	44	
5	4.2	1.381	50	



Calibrated by

(Mr. Anurak Tongkajonsakda)
RYG Field Services Scientist (2)

Approved by :

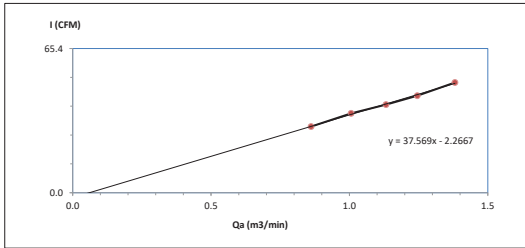
(Mr. Supot Salamteh)
Field Services Section Head




High Volume Air Sampler Calibration Worksheet

Project Site :	Gulf TS4 Co., Ltd.	Barometric Pressure (mm Hg) :	755.3
Calibrate Location :	โรงเรือนน้ำพริก (ราชพฤกษ์ปิ่นแก้ว)	Temperature (°C) :	30.1
Calibrate Date :	20-Oct-25	High Volume ID :	RYG_FS0397
CalibrationSheet No.:	C-201025-RYG_FS0397	High Volume Model :	TE-5009X
Calibrator ID:	RYG_FS0205	High Volume S/N :	5687
Calibrator Model:	TE-S028A	Calibrator Slope :	0.95561
Calibrator S/N :	1166	Calibrator Intercept :	-0.02266

Test No.	Delta H ₂ O (inch)	Qa (m ³ /min)	I : Chart (CFM)	Linear Regression
1	1.6	0.861	30	Slope : 37.5689 Intercept : -2.2667 Correlation Coefficient : 0.9985
2	2.2	1.006	36	
3	2.8	1.132	40	
4	3.4	1.245	44	
5	4.2	1.381	50	



Calibrated by 
(Mr. Anurak Tongkhajonsakda)
RYG Field Services Scientist (2)

Approved by : 
(Mr. Supot Salamatheh)
Field Services Section Head

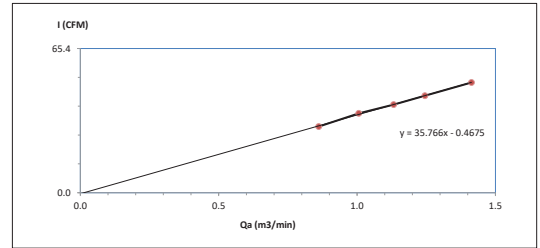
FORM NO.: F 06-074 REVISION NO.:2 ISSUE DATE: 20/11/23




High Volume Air Sampler Calibration Worksheet

Project Site :	Gulf TS4 Co., Ltd.	Barometric Pressure (mm Hg) :	755.3
Calibrate Location :	โรงเรือนพริกน้ำพริก	Temperature (°C) :	30.1
Calibrate Date :	20-Oct-25	High Volume ID :	RYG_FS0184
CalibrationSheet No.:	C-201025-RYG_FS0184	High Volume Model :	TE-5009X
Calibrator ID:	RYG_FS0205	High Volume S/N :	4792
Calibrator Model:	TE-S028A	Calibrator Slope :	0.95561
Calibrator S/N :	1166	Calibrator Intercept :	-0.02266

Test No.	Delta H ₂ O (inch)	Qa (m ³ /min)	I : Chart (CFM)	Linear Regression
1	1.6	0.861	30	Slope : 35.7664 Intercept : -0.4675 Correlation Coefficient : 0.9992
2	2.2	1.006	36	
3	2.8	1.132	40	
4	3.4	1.245	44	
5	4.4	1.413	50	



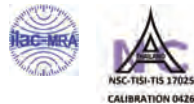
Calibrated by 
(Mr. Anurak Tongkhajonsakda)
RYG Field Services Scientist (2)

Approved by : 
(Mr. Supot Salamatheh)
Field Services Section Head

FORM NO.: F 06-074 REVISION NO.:2 ISSUE DATE: 20/11/23

SARTORIUS

Accredited by
NSC-TISI-TIS 17025
Calibration 0426



Calibration certificate


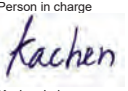
Calibration Certificate No. 25BKL0001

Object	Electronic non-automatic weighing instrument	This calibration certificate documents the traceability to national standards.
Manufacturer	Sartorius	Uncertainties of measurements are taken into account when only statements of compliance are made.
Type	LA130S-F	This certificate was prepared by Sartorius Corporation in accordance to the current ISO/IEC 17025:2017 standard and Sartorius Work Instruction (Method) SOP WI 08.
Serial | QM Ident. no.	25409664 | RYG_EN0001	This certificate relate and apply this equipment only.
Customer	ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)	
Order no.	2230	
Number of pages	4	
Date of calibration	20 Feb 2025	

REVIEW BY 
APPROVED BY 
NEXT CAL DATE 20/02/26

This calibration certificate may not be reproduced other than in full except with the permission of NSC-TISI-TIS-17025 and the issuing laboratory. Calibration certificates without signature are not valid.

The user is obliged to have the object recalibrated at appropriate intervals.

Date	06 Mar 2025	Approval of the Calibration Certificate	Person in charge
			
		Mr. Chonchai Inthana	Kachen Lalee

Calibration certificate No.: 25BKL0001

Calibration Certificate

Calibration object

Single range instrument

Model	LA130S-F
Serial Number	25409664
QM Ident. no | Inventory no.	RYG_EN0001 | ---

Maximum capacity (Max. load)	150.0000 g
Measured range	150.0000 g
Scale interval	0.0001 g

Place of calibration

Address	According to page 1
Department | Cost center	Laboratory Department. | ---
Building | Floor	--- | 1st Floor.
Room	Balance Room.
Maximum temperature variation at place of calibration	5 K

Calibration procedure

EURAMET cg-18, V4.0 - Guidelines on the Calibration of Non-Automatic Weighing Instruments

Test equipment

Test equipment type	Test equipment ID	Valid until
Thermometer	MHB-382SD s/nB011342 Traceable to SI unit through DKSH	21 Aug 2025
Test weight set OIML R111 E2	Certificate No.M2308197S ,E2(Traceable to SI unit through TCS)	23 Aug 2025

Adjustment Status

The measuring device was internally adjusted before the calibration.

Environmental and measuring conditions

Date of calibration 20 Feb 2025
Temperature at place of calibration | Temp. diff. 24.5 °C | 1.0 K
Tweights - Tplace
Measuring conditions The installation site is suitable. The device was levelled. Balance was loaded up to Max before test.
Comments Humidity 58.0 %RH.

Measurement results | Measurement uncertainties

Repeatability		Eccentricity	
Test load (nominal): 10 g | 100 g		Test load (nominal): 50 g	
10 g	100 g	Center	50.0000 g
1	10.0000 g	100.0000 g	50.0001 g
2	9.9999 g	100.0000 g	50.0000 g
3	10.0000 g	99.9999 g	49.9999 g
4	10.0000 g	100.0000 g	50.0001 g
5	10.0000 g	99.9999 g	
6	9.9999 g	99.9999 g	
7	10.0000 g	100.0000 g	
8	10.0000 g	100.0000 g	
9	10.0000 g	100.0000 g	
10	10.0000 g	100.0000 g	
s = 0.00004 g		s = 0.00005 g	

Testload	Indication	Error	Expansion factor	Uncertainty	Uncertainty relative
L	I	E	k	U(E)	U _{rel} (E)
0.0100 g	0.0100 g	0.0000 g	2.00	0.00012 g	1.2 %
0.0500 g	0.0500 g	0.0000 g	2.00	0.00013 g	0.25 %
0.1000 g	0.1000 g	0.0000 g	2.00	0.00013 g	0.13 %
0.5000 g	0.5000 g	0.0000 g	2.00	0.00013 g	0.026 %
1.0000 g	1.0000 g	0.0000 g	2.00	0.00013 g	0.013 %
2.0000 g	2.0000 g	0.0000 g	2.00	0.00013 g	0.0065 %
5.0000 g	5.0000 g	0.0000 g	2.00	0.00013 g	0.0026 %
10.0000 g	10.0000 g	0.0000 g	2.00	0.00013 g	0.0013 %
20.0000 g	20.0000 g	0.0000 g	2.00	0.00014 g	0.00069 %
100.0000 g	100.0000 g	0.0000 g	2.00	0.00021 g	0.00021 %
150.0000 g	149.9999 g	-0.0001 g	2.00	0.00028 g	0.00019 %

Maximum error of indication |E_{max} = 0.0001 g

U_{rel}(E) is the quotient of U(E) and test load L. The uncertainty of measurement U(E) is valid only if error E is considered. You will find reference notes on the uncertainty of measurement U_{rel} use under: Appendix to the calibration certificate | Interpretation of measurement results.
Reference note: The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the documented Expansion factor, determined in accordance with the European Calibration Guideline EURAMET cg-18, V4.0. There is a 95 % probability that the value of the measurand will be in the assigned value range.

End of calibration certificate

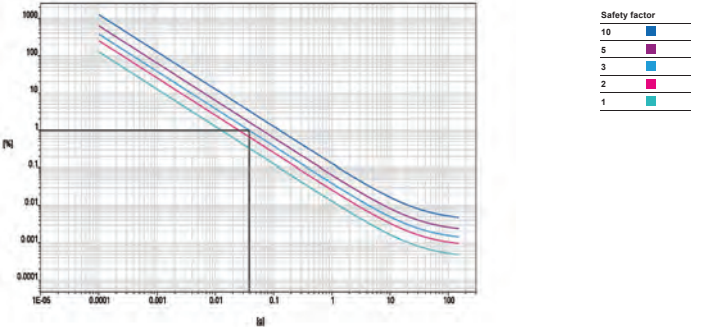
Uncertainty of measurement in use

Device adjusted before measurement Yes
Temperature deviation considered 1.5 K (isoCAL active)
Temperature coefficient considered 1 · 10⁻⁴/K
Uncertainty of the weighing result U_{gl}(W) U_{gl}(W) = 0.00013 g + 3.96 · 10⁻⁴ · R

Reference note: The current uncertainty of measurement is calculated by entering of the reading R into this formula. In relation to this, there is no need for a correction of the indication error. The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied with an Expansion factor of 2, determined in accordance with the European Calibration Guideline EURAMET cg-18, V4.0. There is a 95 % probability that the value of the measurand will be in the assigned value range.

Indication in % from max load	Net indication R	Uncertainty U _{gl} (W)	Uncertainty relative U _{gl} (W) _{rel}
1 %	1.5000 g	0.00014 g	0.0091 %
25 %	37.5000 g	0.00028 g	0.00074 %
50 %	75.0000 g	0.00043 g	0.00057 %
75 %	112.5000 g	0.00058 g	0.00051 %
100 %	150.0000 g	0.00072 g	0.00048 %

Graphic realization of the relative uncertainty of measurement | process accuracy



Displayed example

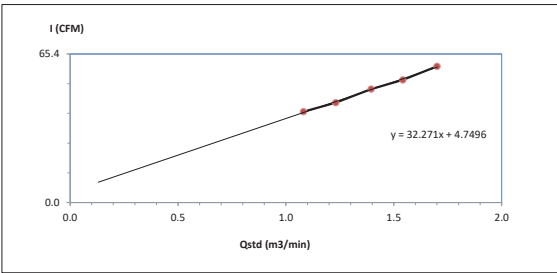
Process accuracy 1.00 %
Safety factor 3
Minimum sample weight 0.0380 g



High Volume Air Sampler Calibration Worksheet

Project Site :	Gulf TS4 Co., Ltd.	Barometric Pressure (mm Hg) :	755.3
Calibrate Location :	โรงเรียนบ้านกุสุมาลย์	Temperature (°C) :	30.1
Calibrate Date :	20-Oct-25	High Volume ID :	RYG_FS0182
CalibrationSheet No.:	C-201025-RYG_FS0182	High Volume Model :	TE-5170D
Calibrator ID:	RYG_FS0205	High Volume S/N :	5335
Calibrator Model :	TE-5028A	Calibrator Slope :	1.52567
Calibrator S/N :	1166	Calibrator Intercept :	-0.03613

Test No.	Delta H ₂ O (inch)	Q _{std} (m ³ /min)	I: Chart (CFM)	Linear Regression	
1	2.6	1.0808	40	Slope :	32.2707
2	3.4	1.2308	44	Intercept :	4.7496
3	4.4	1.3952	50	Correlation Coefficient :	0.9984
4	5.4	1.5417	54		
5	6.6	1.7006	60		



Calibrated by Approved by

(Mr. Anurak Tongkhajonsakda)
RYG Field Services Scientist (2)

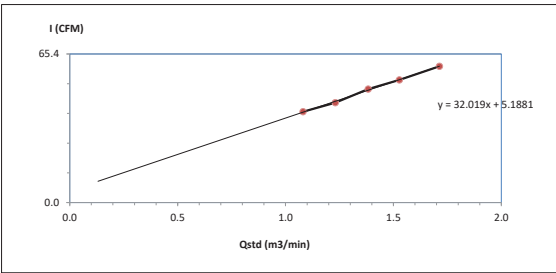
(Mr. Supot Salameh)
Field Services Section Head



High Volume Air Sampler Calibration Worksheet

Project Site :	Gulf TS4 Co., Ltd.	Barometric Pressure (mm Hg) :	755.3
Calibrate Location :	โรงเรียนชุมชนวัดหน้าศาลารัตนออก	Temperature (°C) :	30.1
Calibrate Date :	20-Oct-25	High Volume ID :	RYG_FS0178
CalibrationSheet No.:	C-201025-RYG_FS0178	High Volume Model :	TE-5170D
Calibrator ID:	RYG_FS0205	High Volume S/N :	4804
Calibrator Model :	TE-5028A	Calibrator Slope :	1.52567
Calibrator S/N :	1166	Calibrator Intercept :	-0.03613

Test No.	Delta H ₂ O (inch)	Q _{std} (m ³ /min)	I: Chart (CFM)	Linear Regression	
1	2.6	1.0808	40	Slope :	32.0190
2	3.4	1.2308	44	Intercept :	5.1881
3	4.3	1.3828	50	Correlation Coefficient :	0.9986
4	5.3	1.5277	54		
5	6.7	1.7132	60		



Calibrated by Approved by

(Mr. Anurak Tongkhajonsakda)
RYG Field Services Scientist (2)

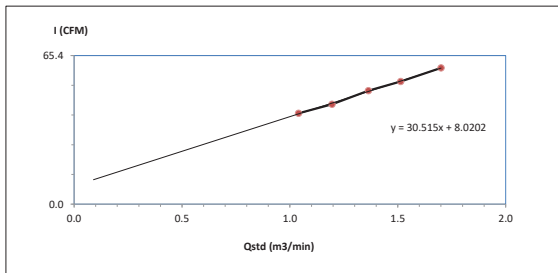
(Mr. Supot Salameh)
Field Services Section Head



High Volume Air Sampler Calibration Worksheet

Project Site : Gulf TS4 Co., Ltd. Barometric Pressure (mm Hg) : 755.3
Calibrate Location : โรงเรือนบำบัดน้ำ (ราชภัฏวชิรเวศน์) Temperature (°C) : 30.1
Calibrate Date : 20-Oct-25 High Volume ID : RYG_FS0175
Calibration Sheet No. : C-201025-RYG_FS0175 High Volume Model : TE-5170D
Calibrator ID : RYG_FS0205 High Volume S/N : 4801
Calibrator Model : TE-5028A Calibrator Slope : 1.52567
Calibrator S/N : 1166 Calibrator Intercept : -0.03613

Test No.	Delta H ₂ O (inch)	Q _{std} (m ³ /min)	I: Chart (CFM)	Linear Regression
1	2.4	1.0398	40	Slope : 30.5148 Intercept : 8.0202 Correlation Coefficient : 0.9990
2	3.2	1.1951	44	
3	4.2	1.3639	50	
4	5.2	1.5136	54	
5	6.6	1.7006	60	



Calibrated by : Approved by :
(Mr. Anurak Tongkhajonsakda) (Mr. Supot Salameh)
RYG Field Services Scientist (2) Field Services Section Head

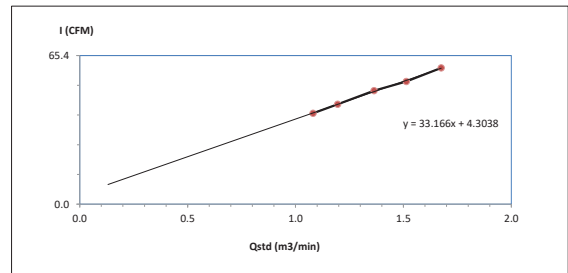
FORM NO.: F 06-073 REVISION NO.:2 ISSUE DATE: 20/11/23



High Volume Air Sampler Calibration Worksheet

Project Site : Gulf TS4 Co., Ltd. Barometric Pressure (mm Hg) : 755.3
Calibrate Location : โรงงานผลิตอาหารยา Temperature (°C) : 30.1
Calibrate Date : 20-Oct-25 High Volume ID : RYG_FS0292
Calibration Sheet No. : C-201025-RYG_FS0292 High Volume Model : TE-5170D
Calibrator ID : RYG_FS0205 High Volume S/N : 5497
Calibrator Model : TE-5028A Calibrator Slope : 1.52567
Calibrator S/N : 1166 Calibrator Intercept : -0.03613

Test No.	Delta H ₂ O (inch)	Q _{std} (m ³ /min)	I: Chart (CFM)	Linear Regression
1	2.6	1.0808	40	Slope : 33.1665 Intercept : 4.3038 Correlation Coefficient : 0.9990
2	3.2	1.1951	44	
3	4.2	1.3639	50	
4	5.2	1.5136	54	
5	6.4	1.6752	60	



Calibrated by : Approved by :
(Mr. Anurak Tongkhajonsakda) (Mr. Supot Salameh)
RYG Field Services Scientist (2) Field Services Section Head

FORM NO.: F 06-073 REVISION NO.:2 ISSUE DATE: 20/11/23



Lot No. 2595459-1

ANALYZER CALIBRATION DATA

Client : Gulf TS4 Co., Ltd. Location : โรงงาน HRSG 11
Date : 21 Oct 25 Test Operator : Jittakorn S.

O₂ ANALYZER Model : HORIBA PG-350 Serial No. : UFKSN78M
Span (%) : 25

	Cylinder Value (%)	Initial Analyzers Calibration Response (%)	Final Analyzers Calibration Response (%)	Difference (Percent of Span)
Zero Gas	0.00	0.05	0.04	0.04
Low-Level Gas	8.00	8.07	8.05	0.08
Span Gas	16.02	16.10	16.07	0.12

NO₂ ANALYZER Model : TELEDYNE API 200EH Serial No. : 774
Span (ppm) : 100

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	0.10	0.10	0.00
Low-Level Gas	56.17	56.20	56.19	0.01
Span Gas	81.09	81.20	81.11	0.09

SO₂ ANALYZER Model : TELEDYNE API 100EH Serial No. : 410
Span (ppm) : 100

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	0.18	0.06	0.12
Low-Level Gas	55.51	55.74	55.60	0.14
Span Gas	79.92	80.21	80.05	0.16

CO ANALYZER Model : TELEDYNE API 300EM Serial No. : 425
Span (ppm) : 100

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	0.02	0.01	0.01
Low-Level Gas	54.24	54.30	54.26	0.04
Span Gas	80.48	80.56	80.51	0.05

Calibrated by

(Mr. Jittakorn Sriwasa)
Environmental Field Scientist (2)

FORM NO.: F 06-062 REVISION NO.: 4 ISSUE DATE: 18/01/24
ALS Laboratory Group



Lot No. 2595459-1

SYSTEM CALIBRATION BIAS AND DRIFT DATA

Client : Gulf TS4 Co., Ltd. Location : โรงงาน HRSG 11
Date : 21 Oct 25 Test Operator : Jittakorn S.

O₂ ANALYZER Cylinder Conc. (%) : 16.02 Span (%) : 25

	O ₂ Analyzer Calibration Response	Initial Values System Calibration Response	System Cal Bias (% of Span)	Final Values System Calibration Response	System Cal Bias (% of Span)	Drift (% of Span)
Zero Gas	0.05	0.05	0.00	0.04	0.04	0.04
Upscale Gas	16.10	16.10	0.00	16.07	0.12	0.12

NO₂ ANALYZER Cylinder Conc. (ppm) : 81.09 Span (ppm) : 100

	NO ₂ Analyzer Calibration Response	Initial Values System Calibration Response	System Cal Bias (% of Span)	Final Values System Calibration Response	System Cal Bias (% of Span)	Drift (% of Span)
Zero Gas	0.10	0.10	0.00	0.10	0.00	0.00
Upscale Gas	81.20	81.20	0.00	81.11	0.09	0.09

SO₂ ANALYZER Cylinder Conc. (ppm) : 79.92 Span (ppm) : 100

	SO ₂ Analyzer Calibration Response	Initial Values System Calibration Response	System Cal Bias (% of Span)	Final Values System Calibration Response	System Cal Bias (% of Span)	Drift (% of Span)
Zero Gas	0.18	0.18	0.00	0.06	0.12	0.12
Upscale Gas	80.21	80.21	0.00	80.05	0.16	0.16

CO ANALYZER Cylinder Conc. (ppm) : 80.48 Span (ppm) : 100

	CO Analyzer Calibration Response	Initial Values System Calibration Response	System Cal Bias (% of Span)	Final Values System Calibration Response	System Cal Bias (% of Span)	Drift (% of Span)
Zero Gas	0.02	0.02	0.00	0.01	0.01	0.01
Upscale Gas	80.56	80.56	0.00	80.51	0.05	0.05

Calibrated by

(Mr. Jittakorn Sriwasa)
Environmental Field Scientist (2)

FORM NO.: F 06-063 REVISION NO.: 4 ISSUE DATE: 18/01/24
ALS Laboratory Group



EMISSION TEST RESULT

Client		Gulf TS4 Co., Ltd.	Run #	1
Date		21 Oct 25	Location	โรงงาน HRSG 11
Start Time		11:30	Test Operator	Jittakorn S.
SO ₂ Analyzer Model	TELEDYNE API 100EH	Finish Time		
NO _x /O ₂ Analyzer Model	TELEDYNE API 200EH	Serial No.		
CO/CO ₂ Analyzer Model	TELEDYNE API 300EM	Serial No.		

Time (min)	O ₂ (%)	CO ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)	Remark
11:30	14.36	3.71	17.19	0.37	3.05	
11:31	14.35	3.72	17.52	0.39	3.36	
11:32	14.35	3.72	17.54	0.35	3.36	
11:33	14.34	3.71	17.38	0.39	3.36	
11:34	14.35	3.71	17.56	0.39	3.20	
11:35	14.38	3.69	17.53	0.37	3.55	
11:36	14.35	3.71	17.55	0.36	3.38	
11:37	14.34	3.72	18.08	0.39	3.55	
11:38	14.36	3.69	17.61	0.39	3.55	
11:39	14.36	3.70	17.10	0.38	3.55	
11:40	14.34	3.71	17.02	0.38	3.55	
11:41	14.41	3.71	17.98	0.35	3.55	
11:42	14.41	3.70	17.61	0.35	3.55	
11:43	14.41	3.68	17.39	0.35	1.06	
11:44	14.40	3.70	17.67	0.36	3.38	
11:45	14.39	3.69	17.77	0.34	4.01	
11:46	14.37	3.71	17.67	0.36	3.55	
11:47	14.39	3.70	17.93	0.38	3.73	
11:48	14.39	3.69	18.22	0.39	3.38	
11:49	14.41	3.68	18.26	0.37	3.55	
11:50	14.41	3.68	17.87	0.36	3.55	
Average	14.37	3.70	17.64	0.37	3.37	

Jittakorn S.

(Mr. Jittakorn Sriwasa)

Environmental Field Scientist (2)

FORM NO.: F 06-060 REVISION NO.: 1 ISSUE DATE: 18/01/24

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EMISSION TEST RESULT

Client		Gulf TS4 Co., Ltd.	Run #	2
Date		21 Oct 25	Location	โรงงาน HRSG 11
Start Time		11:51	Test Operator	Jittakorn S.
SO ₂ Analyzer Model	TELEDYNE API 100EH	Finish Time		
NO _x /O ₂ Analyzer Model	TELEDYNE API 200EH	Serial No.		
CO/CO ₂ Analyzer Model	TELEDYNE API 300EM	Serial No.		

Time (min)	O ₂ (%)	CO ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)	Remark
11:51	14.38	3.69	17.60	0.37	3.55	
11:52	14.36	3.71	17.38	0.34	3.38	
11:53	14.35	3.71	17.58	0.36	3.21	
11:54	14.38	3.69	18.29	0.33	3.38	
11:55	14.41	3.69	17.52	0.33	3.55	
11:56	14.39	3.69	18.09	0.35	3.21	
11:57	14.41	3.68	18.17	0.34	3.21	
11:58	14.40	3.68	18.15	0.31	3.21	
11:59	14.40	3.68	18.03	0.33	4.03	
12:00	14.40	3.68	17.86	0.33	3.36	
12:01	14.42	3.68	18.55	0.34	3.21	
12:02	14.42	3.67	18.35	0.34	3.37	
12:03	14.41	3.68	18.06	0.36	2.86	
12:04	14.39	3.68	17.96	0.34	3.53	
12:05	14.38	3.69	18.34	0.34	3.03	
12:06	14.38	3.69	19.40	0.33	3.03	
12:07	14.39	3.67	17.76	0.33	3.18	
12:08	14.38	3.69	17.44	0.34	3.03	
12:09	14.36	3.70	17.97	0.32	3.36	
12:10	14.36	3.70	17.93	0.33	3.03	
12:11	14.40	3.68	18.50	0.33	2.84	
Average	14.39	3.68	18.04	0.34	3.27	

Jittakorn S.

(Mr. Jittakorn Sriwasa)

Environmental Field Scientist (2)

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EMISSION TEST RESULT

Client		Gulf TS4 Co., Ltd.	Run #	3
Date		21 Oct 25	Location	โรงงาน HRSG 11
Start Time		12:12	Test Operator	Jittakorn S.
SO ₂ Analyzer Model	TELEDYNE API 100EH	Finish Time		
NO _x /O ₂ Analyzer Model	TELEDYNE API 200EH	Serial No.		
CO/CO ₂ Analyzer Model	TELEDYNE API 300EM	Serial No.		

Time (min)	O ₂ (%)	CO ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)	Remark
12:12	14.40	3.67	18.45	0.34	3.18	
12:13	14.27	3.76	21.12	0.38	3.36	
12:14	14.28	3.73	21.14	0.36	2.86	
12:15	14.35	3.70	17.70	0.36	2.16	
12:16	14.26	3.76	16.92	0.32	2.86	
12:17	14.22	3.78	17.07	0.34	2.75	
12:18	14.22	3.78	16.82	0.33	3.04	
12:19	14.19	3.79	16.66	0.33	3.04	
12:20	14.22	3.79	16.44	0.33	3.30	
12:21	14.25	3.76	16.80	0.32	3.04	
12:22	14.26	3.76	16.66	0.29	3.04	
12:23	14.27	3.75	16.58	0.32	3.04	
12:24	14.27	3.75	16.45	0.29	3.04	
12:25	14.31	3.73	17.10	0.33	2.87	
12:26	14.34	3.72	17.16	0.30	2.86	
12:27	14.31	3.72	16.75	0.32	3.03	
12:28	14.30	3.74	16.99	0.29	3.21	
12:29	14.25	3.76	16.60	0.27	4.19	
12:30	14.24	3.76	16.68	0.31	3.04	
12:31	14.26	3.74	16.40	0.29	3.21	
12:32	14.24	3.77	16.56	0.27	3.21	
Average	14.27	3.74	17.29	0.32	3.07	

Jittakorn S.

(Mr. Jittakorn Sriwasa)

Environmental Field Scientist (2)

FORM NO.: F 06-060 REVISION NO.: 1 ISSUE DATE: 18/01/24

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ANALYZER CALIBRATION DATA

Lot No. 2595460-1

Client	: Gulf TS4 Co., Ltd.	Location	: โรงงาน HRSG 12
Date	: 21 Oct 25	Test Operator	: Naratip T.
O ₂ ANALYZER Model	: TELEDYNE API N200H	Serial No.	: 101
Span (%)	: 25		

	Cylinder Value (%)	Initial Analyzers Calibration Response (%)	Final Analyzers Calibration Response (%)	Difference (Percent of Span)
Zero Gas	0.00	0.00	0.02	0.08
Low-Level Gas	8.19	8.20	8.21	0.04
Span Gas	16.07	16.07	16.09	0.08

NO _x ANALYZER Model	: TELEDYNE API N200H	Serial No.	: 101
Span (ppm)	: 100		

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	0.00	0.03	0.03
Low-Level Gas	55.91	55.89	55.88	0.01
Span Gas	82.51	82.50	82.48	0.02

SO ₂ ANALYZER Model	: TELEDYNE API N100H	Serial No.	: 68
Span (ppm)	: 100		

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	0.00	0.05	0.05
Low-Level Gas	56.28	56.28	56.25	0.03
Span Gas	79.76	79.76	79.74	0.02

CO ANALYZER Model	: TELEDYNE API N300M	Serial No.	: 80
Span (ppm)	: 100		

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	0.00	0.01	0.01
Low-Level Gas	55.20	55.20	55.21	0.01
Span Gas	79.74	79.74	79.72	0.02

Calibrated by

Naratip T.

(Mr. Naratip Thueakchaikam)

Environmental Field Scientist (1)

FORM NO.: F 06-062 REVISION NO.: 4 ISSUE DATE: 18/01/24

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Lot No. 2595460-1

SYSTEM CALIBRATION BIAS AND DRIFT DATA

Client : Gulf TS4 Co., Ltd. Location : 11400 HRSQ 12
Date : 21 Oct 25 Test Operator : Naratip T.

O₂ ANALYZER
Cylinder Conc. (%) : 16.07 Span (%) : 25

	O ₂ Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	0.00	0.05	0.20	0.05	0.20	0.00
Upscale Gas	16.07	16.14	0.28	16.14	0.28	0.00

NO₂ ANALYZER
Cylinder Conc. (ppm) : 82.51 Span (ppm) : 100

	NO ₂ Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	0.00	0.04	0.04	0.04	0.04	0.00
Upscale Gas	82.50	82.45	0.05	82.45	0.05	0.00

SO₂ ANALYZER
Cylinder Conc. (ppm) : 79.76 Span (ppm) : 100

	SO ₂ Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	0.00	0.05	0.05	0.05	0.05	0.00
Upscale Gas	79.76	79.70	0.06	79.70	0.06	0.00

CO ANALYZER
Cylinder Conc. (ppm) : 79.74 Span (ppm) : 100

	CO Analyzer Calibration Response	Initial Values		Final Values		Drift (% of Span)
		System Calibration Response	System Cal Bias (% of Span)	System Calibration Response	System Cal Bias (% of Span)	
Zero Gas	0.00	0.04	0.04	0.04	0.04	0.00
Upscale Gas	79.74	79.70	0.04	79.70	0.04	0.00

Calibrated by

(Mr. Naratip Thueakchaikam)

Environmental Field Scientist (1)

FORM NO.: F 06-063 REVISION NO.: 4 ISSUE DATE: 18/01/24

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EMISSION TEST RESULT

Client : Gulf TS4 Co., Ltd. Run # : 1
Date : 21 Oct 25 Location : 11400 HRSQ 12
Start Time : 11:00 Test Operator : Naratip T.
SO₂ Analyzer Model : TELEDYNE API N100H Finish Time : 11:20
NO_x/O₂ Analyzer Model : TELEDYNE API N200H Serial No. : 68
CO/CO₂ Analyzer Model : TELEDYNE API N300M Serial No. : 101
Serial No. : 80

Time (min)	O ₂ (%)	CO ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)	Remark
11:00	14.02	3.75	18.79	0.17	1.20	
11:01	14.01	3.75	18.80	0.15	1.22	
11:02	14.01	3.75	18.81	0.16	1.19	
11:03	14.02	3.76	18.50	0.16	1.14	
11:04	14.02	3.74	18.39	0.15	1.08	
11:05	14.02	3.73	18.42	0.16	1.03	
11:06	14.02	3.74	18.54	0.16	1.02	
11:07	14.04	3.74	18.55	0.15	1.05	
11:08	14.02	3.73	18.59	0.14	1.06	
11:09	14.01	3.74	18.56	0.15	1.08	
11:10	14.03	3.74	18.50	0.17	1.12	
11:11	14.05	3.73	18.40	0.17	1.12	
11:12	14.03	3.73	18.39	0.15	1.08	
11:13	14.02	3.74	18.41	0.16	1.09	
11:14	14.03	3.74	18.40	0.14	1.06	
11:15	14.00	3.74	18.28	0.14	1.05	
11:16	14.01	3.75	18.23	0.14	1.01	
11:17	14.02	3.74	18.19	0.13	0.97	
11:18	14.04	3.74	18.23	0.16	0.98	
11:19	14.05	3.73	18.20	0.18	0.99	
11:20	14.03	3.72	18.30	0.18	0.99	
Average	14.02	3.74	18.44	0.16	1.07	

(Mr. Naratip Thueakchaikam)

Environmental Field Scientist (1)

FORM NO.: F 06-060 REVISION NO.: 1 ISSUE DATE: 18/01/24

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EMISSION TEST RESULT

Client : Gulf TS4 Co., Ltd. Run # : 2
Date : 21 Oct 25 Location : 11400 HRSQ 12
Start Time : 11:21 Test Operator : Naratip T.
Finish Time : 11:41
SO₂ Analyzer Model : TELEDYNE API N100H Serial No. : 68
NO_x/O₂ Analyzer Model : TELEDYNE API N200H Serial No. : 101
CO/CO₂ Analyzer Model : TELEDYNE API N300M Serial No. : 80

Time (min)	O ₂ (%)	CO ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)	Remark
11:21	14.02	3.73	18.43	0.18	1.01	
11:22	14.05	3.73	18.38	0.18	1.06	
11:23	14.05	3.72	18.27	0.17	1.03	
11:24	14.05	3.72	18.15	0.15	1.00	
11:25	14.05	3.72	18.18	0.16	0.97	
11:26	14.06	3.72	18.08	0.16	0.94	
11:27	14.06	3.71	18.08	0.17	0.90	
11:28	14.06	3.71	18.09	0.15	0.90	
11:29	14.07	3.72	18.17	0.18	0.91	
11:30	14.06	3.72	18.20	0.19	0.92	
11:31	14.05	3.72	18.30	0.17	0.91	
11:32	14.07	3.71	18.30	0.14	0.92	
11:33	14.07	3.71	18.22	0.17	0.90	
11:34	14.08	3.70	18.06	0.16	0.92	
11:35	14.06	3.71	18.08	0.16	0.95	
11:36	14.06	3.72	18.17	0.17	0.98	
11:37	14.08	3.71	18.22	0.17	0.99	
11:38	14.09	3.71	18.19	0.17	1.01	
11:39	14.09	3.71	18.20	0.17	1.02	
11:40	14.08	3.71	18.19	0.17	0.99	
11:41	14.08	3.72	18.24	0.16	0.96	
Average	14.06	3.71	18.20	0.17	0.96	

(Mr. Naratip Thueakchaikam)

Environmental Field Scientist (1)

FORM NO.: F 06-060 REVISION NO.: 1 ISSUE DATE: 18/01/24

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EMISSION TEST RESULT

Client : Gulf TS4 Co., Ltd. Run # : 3
Date : 21 Oct 25 Location : 11400 HRSQ 12
Start Time : 11:42 Test Operator : Naratip T.
Finish Time : 12:02
SO₂ Analyzer Model : TELEDYNE API N100H Serial No. : 68
NO_x/O₂ Analyzer Model : TELEDYNE API N200H Serial No. : 101
CO/CO₂ Analyzer Model : TELEDYNE API N300M Serial No. : 80

Time (min)	O ₂ (%)	CO ₂ (%)	NO _x (ppm)	SO ₂ (ppm)	CO (ppm)	Remark
11:42	14.11	3.71	18.16	0.16	0.92	
11:43	14.10	3.69	17.56	0.14	0.88	
11:44	14.06	3.71	16.96	0.13	0.87	
11:45	14.08	3.71	16.64	0.15	0.86	
11:46	14.08	3.71	16.66	0.17	0.86	
11:47	14.09	3.71	16.87	0.17	0.88	
11:48	14.10	3.71	17.03	0.17	0.89	
11:49	14.12	3.70	17.03	0.14	0.86	
11:50	14.13	3.69	17.01	0.17	0.81	
11:51	14.14	3.68	17.14	0.16	0.80	
11:52	14.13	3.68	17.18	0.17	0.78	
11:53	14.13	3.68	17.05	0.16	0.79	
11:54	14.09	3.68	16.82	0.18	0.78	
11:55	14.08	3.71	16.64	0.15	0.79	
11:56	14.09	3.71	16.51	0.17	0.80	
11:57	14.11	3.71	16.71	0.17	0.83	
11:58	14.11	3.71	17.01	0.18	0.82	
11:59	14.10	3.70	17.15	0.15	0.82	
12:00	14.11	3.70	17.24	0.15	0.85	
12:01	14.10	3.69	17.36	0.15	0.84	
12:02	14.12	3.69	17.35	0.15	0.83	
Average	14.10	3.70	17.05	0.16	0.84	

(Mr. Naratip Thueakchaikam)

Environmental Field Scientist (1)

FORM NO.: F 06-060 REVISION NO.: 1 ISSUE DATE: 18/01/24

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CERTIFICATE OF ANALYSIS

Grade of Product: EPA PROTOCOL STANDARD

Customer: AIR LIQUIDE
(THAILAND) LTD
Part Number: E04N199E3HA0002
Cylinder Number: GN0029492
Laboratory: 124 - Plumsteadville - PA
PGVP Number: A12023
Gas Code: CO,NO,NOX,SO2,BALN

Reference Number: 160-402885482-1
Cylinder Volume: 247.0 CF
Cylinder Pressure: 2215 PSIG
Valve Outlet: 860
Certification Date: May 21, 2023
Expiration Date: Nov 21, 2031

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 820R-12051, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted. The results which only to the same basis. The report shall not be reproduced in full without approval of the laboratory. Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS					
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
NOX	80.00 PPM	81.08 PPM	G1	+/- 0.7% NIST Traceable	11/14/2023, 11/21/2023
CARBON MONOXIDE	80.00 PPM	80.48 PPM	G1	+/- 0.5% NIST Traceable	11/14/2023
NITRIC OXIDE	80.00 PPM	80.97 PPM	G1	+/- 0.7% NIST Traceable	11/14/2023, 11/21/2023
SULFUR DIOXIDE	80.00 PPM	79.92 PPM	G1	+/- 0.5% NIST Traceable	11/14/2023
NITROGEN	Balance				

CALIBRATION STANDARDS					
Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	110101-09	KAL00080	97.31 PPM CARBON MONOXIDE/NITROGEN	+/- 0.4%	May 25, 2028
PRM	C2319101	APE1514048	100.19 PPM NITRIC OXIDE/NITROGEN	+/- 0.3%	Feb 28, 2025
GMS	260342502	CC354074	85.48 PPM NITRIC OXIDE/NITROGEN	+/- 0.4%	May 25, 2021
PRM	15408	D915560	15.91 PPM NITROGEN DIOXIDE/AIR	+/- 1.5%	Feb 17, 2023
GMS	40164676101	CC050133	4.881 PPM NITROGEN DIOXIDE/NITROGEN	+/- 1.6%	Sep 23, 2025
NTRM	160102-22	KAL003820	97.88 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.8%	Nov 01, 2027

ANALYTICAL EQUIPMENT		
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet iS50 FTIR AUP2010245 CO	FTIR	Nov 09, 2023
Nicolet iS50 FTIR AUP2010245 NO	FTIR	Nov 15, 2023
Nicolet iS50 FTIR AUP2010245 NO2	FTIR	Nov 02, 2023
Nicolet iS50 FTIR AUP2010245 SO2	FTIR	Oct 26, 2023

Triad Data Available Upon Request

NOTES: Gross Weight: 48.4 Kg
Net Weight: 8.1 Kg



Michael A. Julek
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CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number: E04N199E3HA0058
Cylinder Number: ND11223
Laboratory: 124 - Plumsteadville - PA
PGVP Number: A12021
Gas Code: CO,NO,NOX,SO2,BALN

Reference Number: 160-402138464-1
Cylinder Volume: 247.2 CF
Cylinder Pressure: 2215 PSIG
Valve Outlet: 860
Certification Date: Jul 15, 2029
Expiration Date: Jul 15, 2029

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 820R-12051, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a mole/mole basis unless otherwise noted. Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS					
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
NOX	55.00 PPM	55.17 PPM	G1	+/- 1.4% NIST Traceable	07/08/2021, 07/15/2021
CARBON MONOXIDE	55.00 PPM	54.24 PPM	G1	+/- 0.5% NIST Traceable	07/08/2021
NITRIC OXIDE	55.00 PPM	55.17 PPM	G1	+/- 1.0% NIST Traceable	07/08/2021, 07/15/2021
SULFUR DIOXIDE	55.00 PPM	55.51 PPM	G1	+/- 1.1% NIST Traceable	07/08/2021, 07/15/2021
NITROGEN	Balance				

CALIBRATION STANDARDS					
Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	11010130	KAL004306	97.31 PPM CARBON MONOXIDE/NITROGEN	+/- 0.4%	Oct 04, 2022
PRM	12366	D945025	9.91 PPM AIR/NITROGEN DIOXIDE	2.0%	Feb 20, 2020
NTRM	200816-50	CC733428	98.51 PPM NITRIC OXIDE/NITROGEN	+/- 0.9%	Oct 08, 2025
GMS	124026889	CC323767	4.029 PPM NITROGEN DIOXIDE/NITROGEN	2.1%	Aug 15, 2021
NTRM	16010224	KAL003838	97.98 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.8%	Dec 23, 2021

ANALYTICAL EQUIPMENT		
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet iS50 FTIR AUP2010245 CO	FTIR	Jun 24, 2021
Nicolet iS50 FTIR AUP2010245 NO	FTIR	Jul 01, 2021
Nicolet iS50 FTIR AUP2010245 NO2	FTIR	Jun 30, 2021
Nicolet iS50 FTIR AUP2010245 SO2	FTIR	Jul 08, 2021

Triad Data Available Upon Request

NOTES: Gross Weight: 47.8 Kg
Net Weight: 7.8 Kg



Michael A. Julek
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Page 1 of 160-402138464-1

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number: E02N192E3HA0000
Cylinder Number: ND400118
Laboratory: 124 - Riverton (SAP) - NJ
PGVP Number: B52017
Gas Code: O2,BALN

Reference Number: 82-401018725-1
Cylinder Volume: 248.4 CF
Cylinder Pressure: 2214 PSIG
Valve Outlet: 590
Certification Date: Oct 23, 2017
Expiration Date: Oct 23, 2025

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 820R-12051, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted. Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS					
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
OXYGEN	8.000 %	8.003 %	G1	+/- 0.4% NIST Traceable	10/23/2017
NITROGEN	Balance				

CALIBRATION STANDARDS					
Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	09060208	CC202337	9.901 % OXYGEN/NITROGEN	+/- 0.3%	Nov 06, 2019

ANALYTICAL EQUIPMENT		
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Horiba MPA 510-Q2-7TWM-041	Paramagnetic	Sep 29, 2017

Triad Data Available Upon Request

NOTES: This calibration std. has been certified in accordance with the May 2012 EPA Traceability Protocol, document EPA-820R-12/051. All testing processes and measurements conform to the requirements of ISO/IEC 17025 and to Airgas ISO 9001:2000 and relate only to items identified on this certificate. All values are certified to be NIST Traceable with total uncertainty as detailed under Analytical Uncertainty. This document shall not be reproduced in full without written approval of the issuer.



TESTING CERT NO. 2000.02

Michael A. Julek
Approved for Release

Page 1 of 82-401018725-1

CERTIFICATE OF ANALYSIS

Grade of Product: EPA PROTOCOL STANDARD

Customer: AIR LIQUIDE
(THAILAND) LTD
Part Number: E02N184E3HA0001
Cylinder Number: GN0027197
Laboratory: 124 - Plumsteadville - PA
PGVP Number: A12022
Gas Code: O2,BALN

Reference Number: 160-402340010-1
Cylinder Volume: 249.8 CF
Cylinder Pressure: 2214 PSIG
Valve Outlet: 590
Certification Date: Feb 02, 2022
Expiration Date: Feb 02, 2030

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 820R-12051, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted. Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS					
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
OXYGEN	19.00 %	18.62 %	G1	+/- 0.4% NIST Traceable	02/02/2022
NITROGEN	Balance				

CALIBRATION STANDARDS					
Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	08010330	K005228	23.20 % OXYGEN/NITROGEN	+/- 0.4%	Jun 01, 2022

ANALYTICAL EQUIPMENT		
Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
SIEMENS OXYMAT 5 - N1-W5-951 - D2	PARAMAGNETIC	Jan 27, 2022

Triad Data Available Upon Request

NOTES: Gross Weight: 48.8 Kg
Net Weight: 8.2 Kg



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Page 1 of 160-402340010-1



CONSOLE CONTROL UNIT CALIBRATION TEST REPORT

Calibration of Date : 10-Jul-25
Next Cal. Date : 10-Jan-26
Barometric Pressure (mmHg) : 751.3
Relative Humidity (%) : 43.7
Temperature (C°) : 27.1
Reference Dry Gas Meter Data
Reference Dry Gas Meter ID : BKK_FS1122
Serial No. : A2003240
Correction Factor (Y) : 1.0000
Next Calibration Date : 25-Feb-26

Console Control Meter Data		Reference Dry Gas Meter Calibration		Console Control Dry Gas Meter		Dry Gas Meter Correction Factor (Y)	Office Calibration Factor (Y)	Office Calibration ΔH _g
ΔH (mm H ₂ O)	Θ Minutes	Vr (Liters)	T _r (°C)	Vm (Liters)	T _i (°C)	To (°C)	Avg. T _m (°C)	
15	12.22	150.11	26.0	967920.0	23.0	20.0	20.0	0.9791
25	9.40	150.11	26.0	967945.6	23.0	20.0	20.0	0.9787
50	6.66	150.00	30.0	968127.0	23.0	20.0	20.0	0.9618
80	5.18	150.21	31.0	968502.2	30.0	30.0	30.0	0.9666
120	4.20	150.10	32.0	968681.2	31.0	31.0	31.0	0.9703
				968893.0	31.0	31.0	31.0	0.9713
				969045.4	31.0	31.0	31.0	0.9703
							Avg.	0.9713

Y Ratio of reading of reference to dry gas meter : tolerance for individual values ± 0.02 from average .

ΔH_g : Office pressure differential that equates to 21.24 in of air @ 25 C and 760 mm of mercury, mmH₂O, tolerance for individual values ± 5.08 from average .

Procedure: 40 CFR 60 APP A METH SEC 5.3.8.7

Calibrated by :

(Mr. Warawut Pubpa)

RYG Field Service Scientist(3)

Approved by :

(Mr. Natthapol Jiengwareewong)

RYG Field Service Specialist(1)

FORM NO.: F 06-024 REVISION NO.: 2 ISSUE DATE: 30 Jan 22



DIGITAL TEMPERATURE CALIBRATION DATA SHEET

Calibration Date :		10 Jul 25	Ambient Temperature (°C)		27.1	
Calibration sheet No. :		C-100725-BKK_FS0519	Relative Humidity (%) :		43.7	
Digital Temperature ID :			BKK_FS0519	Reference Temperature ID		BKK_FS1144
Serial No. :			1504025	Serial No. :		20109006013
Model :			XC-572-V	Model :		Digicon-CC-VT-MS
			Next Calibrate :		5 Jan 26	
Location	Reference Temperature °C	Digital Temperature °C	Error °C	MPE	Pass / Fail	
Stack	0	3	3	±3	Pass	
	25	27	2	±3	Pass	
	50	51	1	±3	Pass	
	100	100	0	±3	Pass	
	150	148	-2	±3	Pass	
	200	198	-2	±3	Pass	
	250	247	-3	±3	Pass	
	300	298	-2	±3	Pass	
	500	497	-3	±3	Pass	
Probe	100	100	0	±3	Pass	
	120	120	0	±3	Pass	
	140	139	-1	±3	Pass	
Oven	100	100	0	±3	Pass	
	120	120	0	±3	Pass	
Filter	140	139	-1	±3	Pass	
	100	100	0	±3	Pass	
	120	120	0	±3	Pass	
Exit	140	139	-1	±3	Pass	
	0	1	1	±3	Pass	
	10	11	1	±3	Pass	
Meter	20	21	1	±3	Pass	
	0	0	0	±3	Pass	
	25	26	1	±3	Pass	
AUX	50	51	1	±3	Pass	
	0	0	0	±3	Pass	
	25	26	1	±3	Pass	
	50	50	0	±3	Pass	

MPE : (Maximum permissible error of measurement) ค่าความผิดพลาดสูงสุดของการวัดที่อนุญาต

Calibrated by :

(Mr. Warawut Pubpa)

RYG Field Service Scientist (3)

Approved by :

(Mr. Natthapol Jiengwareewong)

RYG Field Service Specialist (1)

FORM NO.: F 06-027 REVISION NO.: 2 ISSUE DATE: 9 Feb 23



PROBE NOZZLE DIAMETER CALIBRATION DATA SHEET

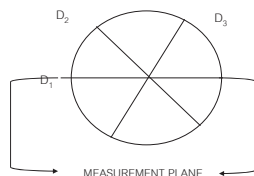
Calibration Date :	10 Jul 25	Nozzle Set ID. :	BKK_FS0524		
Calibration Sheet No. :	C-100725-BKK_FS0524	Vernier Caliper ID.:	RYG_FS0539		
Nozzle ID #	Nozzle Diameter (cm.)			Hi - Lo	(D ₁ + D ₂ + D ₃) / 3
	D ₁	D ₂	D ₃	ΔD	D _{avg}
1	0.318	0.319	0.318	0.001	0.318
2	0.472	0.474	0.475	0.003	0.474
3	0.545	0.542	0.540	0.005	0.542
4	0.632	0.640	0.634	0.008	0.635
5	0.792	0.794	0.792	0.002	0.793
6	0.952	0.942	0.952	0.010	0.949
7	1.080	1.102	1.092	0.022	1.091
8	1.262	1.262	1.262	0.000	1.262
9	1.598	1.598	1.600	0.002	1.599

Where :

D₁, D₂, D₃ = There different nozzle diameters at 60 degrees to each other, each measured the nearest 0.025 mm.

ΔD = Maximum distance between any two diameters, must be ≤ 0.100 mm.

D_{avg} = (D₁ + D₂ + D₃) / 3



Calibrated by :

(Mr. Warawut Pubpa)

RYG Field Service Scientist (3)

Approved by :

(Mr. Natthapol Jiengwareewong)

RYG Field Service Specialist (1)

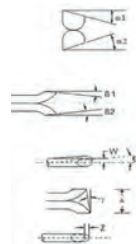
FORM NO.: F 06-026 REVISION NO.: 0 ISSUE DATE: 16-1-02



Type S Pitot Tube Calibration

Date Calibration 10-Jul-25
Pitot ID BKK_FS0531
Pitot SN -

Due Date 10-Jan-26
Inclinometer ID BKK_FS1131
Vernier ID RYG_FS0539



Parameter	Value	Allowable Range	Check
α1	6.2	-10° < α1 < +10°	OK
α2	4.2	-10° < α2 < +10°	OK
β1	4.7	-5° < β1 < +5°	OK
β2	0.9	-5° < β2 < +5°	OK
γ	1.7	-	-
θ	1.6	-	-
Z = A tan γ	0.026	Z ≤ 0.125"	OK
W = A tan θ	0.024	W ≤ 0.031"	OK
Dt	0.375	0.188" to 0.375"	OK
A/2Dt	1.160	1.05 ≤ PA/Dt ≤ 1.5	OK
A	0.87	2.1Dt ≤ A ≤ 3Dt	OK

Certify that pitot tube/porbe meets or exceeds all specifications, criteria and/or applicable design features and is hereby assigned a pitot tube certification fact of 0.84 . See 40 CFR Pt. 60, App. A, EPA Method 2.

Calibrated by :

(Mr. Warawut Pubpa)
RYG Field Services Scientist (3)

Approved By :

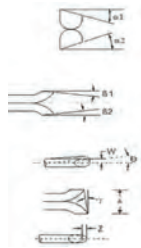
(Mr. Natthapol Jiengwareewong)
RYG Field Services Specialist (1)

FORM NO.: F 06-124 REVISION NO.: 0 ISSUE DATE: 25/12/23



Type S Pitot Tube Calibration

Date Calibration 24-May-25 Due Date 23-Nov-25
Pitot ID BKK_FS0552 Inclinerometer ID BKK_FS1131
Pitot SN - Vernier ID BKK_FS1405



Parameter	Value	Allowable Range	Check
α_1	2.2	$-10^\circ < \alpha_1 < +10^\circ$	OK
α_2	3	$-10^\circ < \alpha_2 < +10^\circ$	OK
β_1	-1.2	$-5^\circ < \beta_1 < +5^\circ$	OK
β_2	2.3	$-5^\circ < \beta_2 < +5^\circ$	OK
γ	1.4	-	-
θ	1.2	-	-
$Z = A \tan \gamma$	0.022	$Z \leq 0.125''$	OK
$W = A \tan \theta$	0.018	$W \leq 0.031''$	OK
Dt	0.375	$0.188'' \text{ to } 0.375''$	OK
$A/2Dt$	1.173	$1.05 \leq A/2Dt \leq 1.5$	OK
A	0.88	$2.1Dt \leq A \leq 3Dt$	OK

Certify that pitot tube/porbe meets or exceeds all specifications, criteria and/or applicable design features and is hereby assigned a pitot tube certification fact of 0.84 . See 40 CFR Pt. 60, App. A,EPA Method 2.

Calibrated by :
(Mr.Prasert.Surakhan)
Enviro Field Services Scientist (3)

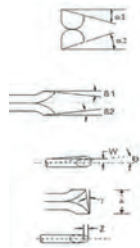
Approved By :
(Mr.Samart Roo-ngan)
Enviro Field Services Specialist (1)

FORM NO.: F 06-124 REVISION NO.: 0 ISSUE DATE: 25/12/23



Type S Pitot Tube Calibration

Date Calibration 10-Jul-25 Due Date 10-Jan-26
Pitot ID BKK_FS0523 Inclinerometer ID BKK_FS1131
Pitot SN - Vernier ID RYG_FS0539



Parameter	Value	Allowable Range	Check
α_1	-1.4	$-10^\circ < \alpha_1 < +10^\circ$	OK
α_2	-0.2	$-10^\circ < \alpha_2 < +10^\circ$	OK
β_1	0.8	$-5^\circ < \beta_1 < +5^\circ$	OK
β_2	-0.4	$-5^\circ < \beta_2 < +5^\circ$	OK
γ	0.8	-	-
θ	0.5	-	-
$Z = A \tan \gamma$	0.013	$Z \leq 0.125''$	OK
$W = A \tan \theta$	0.008	$W \leq 0.031''$	OK
Dt	0.310	$0.188'' \text{ to } 0.375''$	OK
$A/2Dt$	1.484	$1.05 \leq A/2Dt \leq 1.5$	OK
A	0.92	$2.1Dt \leq A \leq 3Dt$	OK

Certify that pitot tube/porbe meets or exceeds all specifications, criteria and/or applicable design features and is hereby assigned a pitot tube certification fact of 0.84 . See 40 CFR Pt. 60, App. A,EPA Method 2.

Calibrated by :
(Mr. Warawut Pubpa)
RYG Field Services Scientist (3)

Approved By :
(Mr.Natthaporn Jengwareewong)
RYG Field Services Specialist (1)

FORM NO.: F 06-124 REVISION NO.: 0 ISSUE DATE: 25/12/23



Calibration Certificate



Certificate No: G 680111
Date of issue : 19-Feb-25

Instrument description : Flue Gas Analyzer
Instrument model : Testo 340
Control unit serial no. : -
Instrument serial no. : 62150585
ID no. or control no. : RYG_FS0465
Manufacturer : Testo SE & Co. KGaA
Probe description : -
Probe model : -
Probe serial no. : -
Customer name : ALS LABORATORY GROUP (THAILAND) CO.,LTD.
Customer address : 104 Phatthanakan 40, Phatthanakan Road, Khwaeng Phatthanakan, Khet Suan Luang, Bangkok, 10250 Thailand
Total pages of certificate : 2 Pages
Receiving no. : L-250514
Receiving date : 18-Feb-25
Parameter of calibration : Gas Calibration(Oxygen 2.50,9.984,21.02 %vol, Carbon Monoxide 80.45,302,1007 ppm, Nitric Oxide 30.0,151.8,322.5 ppm, Sulphur Dioxide 50.36,100.7,600.8 ppm)
Condition of UUC : Used
Ambient condition : All of the Measurement were carried out the stabilized laboratory
Temperature : 23 \pm 5 $^\circ$ C
Humidity : 55 \pm 15 %RH
Calibration place : 17/121 Soi Ngamwongwan 47 Yaek 48, Toongsonghong, Lakki, Bangkok 10210
Calibration procedure no : This instrument was calibrated by comparison with Standard gas mixture according to calibration Work Instruction no. WI-CL-28-C

REVIEW BY :
APPROVED BY :
NEXT CAL DATE : 18/ 02/ 2026

The calibration certificate expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.
This certificate is applied only to item under test Environmental conditions.
This Calibration Certificate may not be reproduced other than in full except with the permission of the issuing laboratory.
Calibration certificates without signature and seal not valid and The results relate only to the items tested/calibrated.
This calibration certificate documents are traceability to national standards, which realize measurement according to the International System of Units (SI).

Date of calibration : 19-Feb-25

Mr. Kwanchai Khumdoung
Calibration Technician

Mrs. Nongluck Wongsettee
Technical Manager



Calibration Certificate



Certificate No.: G 680111

Standard References (Table 1)

Standard	Certificate No.	Vendor	Due date
Oxygen (O ₂) 2.50 % Vol	2412/23	Linde	27-Aug-27
Oxygen (O ₂) 9.984 % Vol	CG-0113-24	Nimt	01-Aug-29
Oxygen (O ₂) 21.02 % Vol	CG-0041-22	Nimt	10-Feb-27
Carbon monoxide (CO) 80.45 ppm	CG-0132-24	Nimt	10-Sep-29
Carbon monoxide (CO) 302 ppm	1915/23	Linde	16-Jun-25
Carbon monoxide (CO) 1007 ppm	1870/24	Linde	17-Jun-26
Nitric Oxide (NO) 30.0 ppm	CG-0065-24	Nimt	06-May-26
Nitric Oxide (NO) 151.8 ppm	0404/25	Linde	09-Feb-27
Nitric Oxide (NO) 322.5 ppm	1974/23	Linde	17-Jul-25
Sulphur Dioxide (SO ₂) 50.36 ppm	2004/23	Linde	17-Jul-25
Sulphur Dioxide (SO ₂) 100.7 ppm	2662/24	Linde	25-Aug-26
Sulphur Dioxide (SO ₂) 600.8 ppm	2003/23	Linde	17-Jul-25

Measured room conditions

Temperature : 22.9 $^\circ$ C Humidity : 66.4 %RH Pressure : 1010.8 mbar

Calibration conditions

Gas Temperature : 23 $^\circ$ C Flow rate : 700 ml/min Gas pressure : 1014.5 mbar

Calibration Results (Without adjustment) (Table 2)

Parameter of Standard	Standard Values	Mean of UUC	Error	Uncertainty (±)
O ₂ (%Vol)	2.50	2.44	-0.06	0.15
O ₂ (%Vol)	9.984	9.91	-0.074	0.20
O ₂ (%Vol)	21.02	21.13	0.11	0.30
CO (ppm)	80.45	81	0.55	3.0
CO (ppm)	302	301	-1	6.0
CO (ppm)	1007	1005	-2	12
NO (ppm)	30.0	32	2.0	8.0
NO (ppm)	151.8	154	2.2	8.0
NO (ppm)	322.5	323	0.5	12
SO ₂ (ppm)	50.36	49	-1.36	6.0
SO ₂ (ppm)	100.7	101	0.3	6.0
SO ₂ (ppm)	600.8	603	2.2	13

Remark : 1 cmol/mol = 1 %vol, 1 μ mol = 1 ppm.

End of Report

Certificate No.: G 680274
Date of issue : 28-Apr-25

Instrument description : Flue Gas Analyzer
Instrument model : Testo 350 New
Instrument serial no. : 62985049/1121
Control unit serial no. : 03580182/1121
ID no. or control no. : RYG_F50564
Manufacturer : Testo SE & Co. KGaA
Probe description : -
Probe model : -
Probe serial no. : -
Customer name : ALS LABORATORY GROUP (THAILAND) CO.,LTD.
Customer address : 104 Phatthanakan 40, Phatthanakan Road, Khwaeng Phatthanakan, Khet Suan Luang, Bangkok, 10250 Thailand
Total pages of certificate : 2 Pages
Receiving no. : L-251464
Receiving date : 24-Apr-25
Parameter of calibration : Gas Calibration (Oxygen 2.50, 9.984, 21.01 %Vol, Carbon Monoxide 80.45, 302.1007 ppm)
Nitrogen Dioxide 30.68, 81.8, 202.6 ppm, Nitric Oxide 30.0, 151.8, 322.5 ppm, Sulphur Dioxide 50.36, 100.7, 600.8 ppm)
Condition of UUC : Used
Ambient condition : All of the Measurement were carried out the stabilized laboratory
Temperature : 23 ± 5 °C
Humidity : 55 ± 15 %RH
Calibration place : 17/121 Soi Ngamwongwan 47 Yaek 48, Toongsonghong, Lakki, Bangkok 10210
Calibration procedure no : This instrument was calibrated by comparison with Standard gas mixture according to calibration Work Instruction. no. WI-CL-28-C

REVIEW BY : *S/S*
APPROVED BY : *[Signature]*
NEXT CAL DATE : 24/04/2026

The calibration certificate expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.
This certificate is applied only to item under test Environmental condition.
This Calibration Certificate may not be reproduced other than in full except with the permission of the issuing laboratory.
Calibration certificates without signature and seal not valid and The results relate only to the items tested/calibrated.
This calibration certificate documents are traceability to national standards, which realize measurement according to the International System of Units (SI).
Date of calibration : 25-Apr-25

[Signature]
Mr. Kwanchai Khamdang
Calibration Technician
[Signature]
Mrs. Nongluck Wongsettee
Technical Manager

FM-CL-09-C Rev.8

Page 1 of 2

Issued Date 26/02/16

Entech Industrial Solution Co.,Ltd.

17/121 Soi Ngamwongwan 47 Yaek 48, Toongsonghong, Lakki, Bangkok 10210 THAILAND Tel. 0-2779-8888 Calibration@entech.co.th
Tax ID : 0105589035591 www.entech.co.th

Certificate No.: G 680274

Standard References (Table 1)

Standard	Certificate No.	Vendor	Due date
Oxygen (O2) 2.50 % Vol	2412/23	Linde	27-Aug-27
Oxygen (O2) 9.984 % Vol	CG-0113-24	Nimt	01-Aug-29
Oxygen (O2) 21.01 % Vol	CG-0112-24	Nimt	01-Aug-29
Carbon monoxide (CO) 80.45 ppm	CG-0132-24	Nimt	10-Sep-29
Carbon monoxide (CO) 302 ppm	1915/23	Linde	16-Jun-25
Carbon monoxide (CO) 1007 ppm	1870/24	Linde	17-Jun-26
Nitrogen Dioxide (NO2) 30.68 ppm	2832/24	Linde	08-Sep-26
Nitrogen Dioxide (NO2) 81.8 ppm	2330/24	Linde	01-Aug-26
Nitrogen Dioxide (NO2) 202.6 ppm	3794/24	Linde	23-Dec-26
Nitric Oxide (NO) 30.0 ppm	CG-0065-24	Nimt	06-May-26
Nitric Oxide (NO) 151.8 ppm	4044/25	Linde	09-Feb-27
Nitric Oxide (NO) 322.5 ppm	1974/23	Linde	17-Jul-25
Sulphur Dioxide (SO2) 50.36 ppm	2004/23	Linde	17-Jul-25
Sulphur Dioxide (SO2) 100.7 ppm	2662/24	Linde	25-Aug-26
Sulphur Dioxide (SO2) 600.8 ppm	2003/23	Linde	17-Jul-25

Measured room conditions

Temperature : 22.6 °C Humidity : 59.6 %RH Pressure : 1010.3 mbar

Calibration conditions

Gas Temperature : 23 °C Flow rate : 1,300 ml/min Gas pressure : 1016.2 mbar

Calibration Results (Without adjustment) (Table 2)

Parameter of Standard	Standard Values	Mean of UUC	Error	Uncertainty (1)
O2 (%Vol)	2.50	2.44	-0.06	0.15
O2 (%Vol)	9.984	9.89	-0.094	0.20
O2 (%Vol)	21.01	21.11	0.10	0.30
CO (ppm)	80.45	81	0.55	3.0
CO (ppm)	302	303	1	6.0
CO (ppm)	1007	1006	-1	12
NO2 (ppm)	30.68	29.4	-1.28	8.0
NO2 (ppm)	81.8	79.9	-1.9	8.0
NO2 (ppm)	202.6	199.8	-2.8	12
NO (ppm)	30.0	31	1.0	8.0
NO (ppm)	151.8	154	2.2	8.0
NO (ppm)	322.5	322	-0.5	12
SO2 (ppm)	50.36	49	-1.36	6.0
SO2 (ppm)	100.7	100	-0.7	6.0
SO2 (ppm)	600.8	602	1.2	13

Remark : 1 cmol/mol = 1 %vol, 1 μmol/mol = 1 ppm, Sensor (NO2,NO,SO2) New.

End of Report

FM-CL-09-C Rev.8

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Issued Date 26/02/16

Entech Industrial Solution Co.,Ltd.

17/121 Soi Ngamwongwan 47 Yaek 48, Toongsonghong, Lakki, Bangkok 10210 THAILAND Tel. 0-2779-8888 Calibration@entech.co.th
Tax ID : 0105589035591 www.entech.co.th

SARTORIUS

Accredited by

NSC-TISI-TIS 17025
Calibration 0426



Calibration certificate

Calibration Certificate No. 25BK10003

Object	Electronic non-automatic weighing instrument	This calibration certificate documents the traceability to national standards.
Manufacturer	Sartorius	Uncertainties of measurements are taken into account when only statements of compliance are made.
Type	MSU224S-100-DU	This certificate was prepared by Sartorius Corporation in accordance to the current ISO/IEC 17025:2017 standard and Sartorius Work Instruction (Method) SOP WI 08.
Serial | QM Ident. no.	31709552 | RYG_EN0003	This certificate relate and apply this equipment only.
Customer	ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch) 616/10 Moo 5 T.Maenam Khu, A.Pluak Daeng, Rayong 21140, Thailand.	
Order no.	2230	
Number of pages	4	
Date of calibration	20 Feb 2025	

REVIEW BY : *Tharitat*
APPROVED BY : *[Signature]*
NEXT CAL DATE : 20/02/26

This calibration certificate may not be reproduced other than in full except with the permission of NSC-TISI-TIS-17025 and the issuing laboratory. Calibration certificates without signature are not valid.

The user is obliged to have the object recalibrated at appropriate intervals.

Date : 06 Mar 2025 Approval of the Calibration Certificate : *[Signature]* Mr. Chonchai Inthana
Person in charge : *[Signature]* Kachen Lalee

Calibration certificate No.: 25BK10003

Calibration Certificate

Calibration object

Single range instrument

Model : MSU224S-100-DU
Serial Number : 31709552
QM Ident. no | Inventory no. : RYG_EN0003 | ---

Maximum capacity (Max. load) : 220.0000 g
Measured range : 220.0000 g
Scale interval : 0.0001 g

Place of calibration

Address : According to page 1
Department | Cost center : Laboratory Department | ---
Building | Floor : --- | 1st Floor.
Room : Balance Room.
Maximum temperature variation at place of calibration : 5 K

Calibration procedure

EURAMET cg-18, V4.0 - Guidelines on the Calibration of Non-Automatic Weighing Instruments

Test equipment

Test equipment type	Test equipment ID	Valid until
Thermometer	MHB-382SD s/nB011342 Traceable to SI unit through DKSH	21 Aug 2025
Test weight set OIML R111 E2	Certificate No.M23081975 .E2(Traceable to SI unit through TCS)	23 Aug 2025

Adjustment Status

The measuring device was internally adjusted before the calibration.

Environmental and measuring conditions

Date of calibration 20 Feb 2025

Temperature at place of calibration | Temp. diff. 24.7 °C | 0.3 K

Twights - 7place

Measuring conditions

The installation site is suitable. The device was levelled. Balance was loaded up to Max before test.

Comments

Humidity 62.3 %RH.

Measurement results | Measurement uncertainties

Repeatability

Test load (nominal): 10 g | 200 g		
	10 g	200 g
1	10.0000 g	200.0000 g
2	10.0000 g	200.0001 g
3	9.9999 g	200.0000 g
4	10.0000 g	200.0000 g
5	10.0000 g	200.0001 g
6	9.9999 g	200.0000 g
7	10.0000 g	200.0000 g
8	10.0000 g	200.0000 g
9	10.0000 g	200.0000 g
10	10.0000 g	200.0001 g
$s = 0.00004 \text{ g}$ $s = 0.00005 \text{ g}$		

Eccentricity

Test load (nominal): 100 g	
Center	100.0000 g
Front left	100.0000 g
Back left	100.0001 g
Back right	99.9999 g
Front right	99.9999 g
Maximum deviation from centric loading indication	
$|\Delta_{\text{ecc}}|_{\text{max}} = 0.0001 \text{ g}$	

Error of indication

Testload	Indication	Error	Expansion factor	Uncertainty	Uncertainty relative
L	I	E	k	U(E)	U _{rel} (E)
0.0100 g	0.0100 g	0.0000 g	2.00	0.00012 g	1.2 %
0.1000 g	0.1000 g	0.0000 g	2.00	0.00013 g	0.13 %
0.5000 g	0.5000 g	0.0000 g	2.00	0.00013 g	0.026 %
1.0000 g	1.0000 g	0.0000 g	2.00	0.00013 g	0.013 %
5.0000 g	5.0000 g	0.0000 g	2.00	0.00013 g	0.0026 %
10.0000 g	10.0000 g	0.0000 g	2.00	0.00013 g	0.0013 %
20.0000 g	20.0000 g	0.0000 g	2.00	0.00014 g	0.00068 %
50.0000 g	50.0000 g	0.0000 g	2.00	0.00015 g	0.00029 %
100.0000 g	100.0001 g	0.0001 g	2.00	0.00018 g	0.00018 %
200.0000 g	200.0000 g	0.0000 g	2.00	0.00028 g	0.00014 %
220.0000 g	220.0000 g	0.0000 g	2.00	0.00032 g	0.00015 %

Maximum error of indication $|E|_{\text{max}} = 0.0001 \text{ g}$

U_{rel}(E) is the quotient of U(E) and test load L. The uncertainty of measurement U(E) is valid only if error E is considered. You will find reference notes on the uncertainty of measurement in use under: Appendix to the calibration certificate | Interpretation of measurement results.
Reference note: The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the documented Expansion factor, determined in accordance with the European Calibration Guideline EURAMET cg-18, V4.0. There is a 95 % probability that the value of the measurand will be in the assigned value range.

End of calibration certificate

Sartorius (Thailand) Co., Ltd.
129 Rama 9 Road, Huaykwang
10310 Bangkok

Verical®
Version 6.5

Page 3 | 4

Uncertainty of measurement in use

Device adjusted before measurement

Yes

Temperature deviation considered

1.5 K (isoCAL active)

Temperature coefficient considered

1 · 10⁻⁴/K

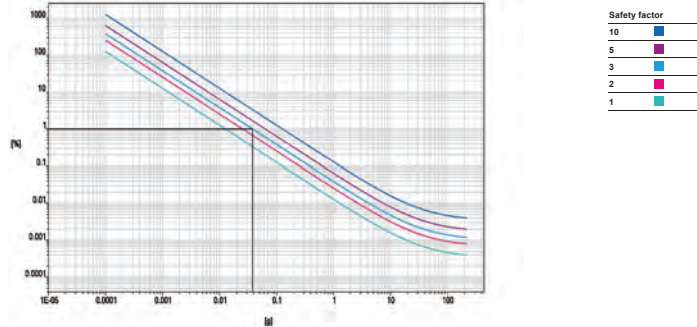
Uncertainty of the weighing result $U_{Gf}(W)$

$U_{Gf}(W) = 0.00013 \text{ g} + 3.42 \cdot 10^{-4} \cdot R$

Reference note: The current uncertainty of measurement is calculated by entering of the reading R into this formula. In relation to this, there is no need for a correction of the indication error. The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied with an Expansion factor of 2, determined in accordance with the European Calibration Guideline EURAMET cg-18, V4.0. There is a 95 % probability that the value of the measurand will be in the assigned value range.

Indication in % from max load	Net indication R	Uncertainty $U_{Gf}(W)$	Uncertainty relative $U_{Gf}(W)_{\text{rel}}$
1 %	2.2000 g	0.00014 g	0.0063 %
25 %	55.0000 g	0.00032 g	0.00058 %
50 %	110.0000 g	0.00051 g	0.00046 %
75 %	165.0000 g	0.00069 g	0.00042 %
100 %	220.0000 g	0.00088 g	0.00040 %

Graphic realization of the relative uncertainty of measurement | process accuracy



Displayed example

Process accuracy 1.00 %
Safety factor 3
Minimum sample weight 0.0380 g

INNOVATIVE INSTRUMENT CALIBRATION LAB
INNOVATIVE INSTRUMENT CO., LTD. HEAD OFFICE
7/19 MOO 11, SOI SENTSIAKORN 11 TAMBON BANG KAE0,
AMPHOE BANG PHU SAMUT PRAKAN PROVINCE 10540 THAILAND
TEL: 0660-2116-5800-1 FAX: 0660-2116-7140



Page 1 of 3

Certificate of Calibration

Customer

Name : ALS Laboratory Group Thailand Co., Ltd. Certificate No : 25-ACT-010
Address : 104 Soi Phatthanakan 40, Phatthanakan Road, Suan Luang, Request No : Req-2025-0091
Bangkok 10250

Unit Under Calibration Details

Measurement item : Acoustic Calibrator Class : 1
Manufacturer : RION Range : 94 dB / 1000 Hz
Model : NC-74 Instrument Status : Used
Serial Number : 34178121
ID : RYG_FS0213

Calibration Environment and Details

Temperature : (23 ± 2 °C)
Humidity : (50 ± 20 %RH)
Barometric Pressure : (1013 ± 10.0 hPa)
Received Date : 15 January 2025
Calibration Date : 16 January 2025
Location of Calibration : LAB 1 Acoustic
Calibration Procedure : In-house method CP-ACT-02 based on IEC 60942:2017 Electroacoustics - Sound calibrators

Reference Standard	Model	Serial Number	Traceable	Due Calibration
Sound Calibrator	SV 35A	58079	EI	12 June 2025
THD Multimeter	2015	1047765	NIMT	16 January 2025

Traceability : This certificate provides traceability of measurement to recognized national standard, and to the realization of the international System of Units (SI).

Note

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor $k=2$, providing a level of confidence approximately 95 %.

Calibrated By :
Mr. Noppadon Luangart
Service Calibration Engineer

Approved By :
Mr. Pacit Mathavorn
Calibration Engineer Supervisor
Issue Date : 16 January 2025

INNOVATIVE INSTRUMENT CALIBRATION LAB
INNOVATIVE INSTRUMENT CO., LTD. HEAD OFFICE
7/19 MOO 11, SOI SENTSIAKORN 11 TAMBON BANG KAE0,
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TEL: 0660-2116-5800-1 FAX: 0660-2116-7140



Page 2 of 3

Certificate No : 25-ACT-010

Request No : Req-2025-0091

Sound pressure level

Calibration Results : Without Adjustment

Calibration Range (dB)	Without Adjustment (dB)		Adjustment (dB)		Uncertainty (± dB)	Acceptance limit Class 1 (± dB)	Result
	Measured	Deviated value	Measured	Deviated value			
94 dB / 1000 Hz	94.11	0.11	-	-	0.13	0.25	Pass

Frequency of Sound pressure level

Calibration Range (Hz)	Without Adjustment		Adjustment		Uncertainty (± %)	Acceptance limit Class 1 (± %)	Result
	Measured (Hz)	Deviated	Measured (Hz)	Deviated			
94 dB / 1000 Hz	1000.00	0.00	-	-	0.01	0.70	Pass

Total Harmonic Distortion plus Noise of Sound pressure level (THD+N %)

Calibration Range (Hz)	Without Adjustment		Adjustment		Uncertainty (± %)	Acceptance limit Class 1 (± %)	Result
	Measured (%)		Measured (%)				
94 dB / 1000 Hz	1.21		-		0.40	2.5	Pass

Note :

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

- Acceptance limit was IEC60942:2017 Class 1

- The calibration results exclude the calibrator pressure correction

- The calibration results exclude the microphone volume correction



Certificate No : 25-ACT-010
Request No : Req-2025-0091

Decision Rule for Statements of Conformity

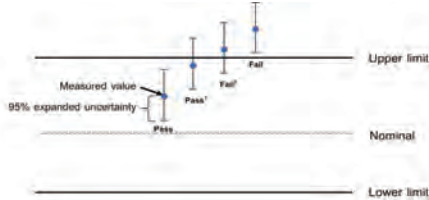
The standard decision rule employed for the statements of conformity to each calibration result will be applied using ILAC-G8:09/2019; Guidelines on the Reporting of Compliance with Specification as following Fig. and statements

Pass – The measurement result plus the expanded uncertainty with a 95% coverage probability were within the limit.

Pass¹ – The measurement result was within the limit. However, a portion of the expanded uncertainty of measurement at 95% exceeds the limit.

Fail¹ – The measurement result was out of the limit. However, a portion of the expanded uncertainty of measurement at 95% is within the limit.

Fail – The measurement result plus the expanded uncertainty with a 95% coverage probability were outside the limit.



End of Calibration

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

FM-708-ACT-02 Rev.03 Issue date 5/6/24

SITHIPORN ASSOCIATES CO., LTD. CALIBRATION LABORATORY

451-451/1 Sirinthon Road, Bangbunru, Bangplad, Bangkok, 10700 Thailand
Tel : +66 2433 8331 Email : calibration@sithiporn.com

SITHIPORN
associates



Cert. No. : ACL25112
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42A / Microphone UC-52 / Preamplifier NH-24
Serial No.: 00623396 / 198643 / 26424
ID No.: RYG_FS0621

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location : -
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

Received Date : 14 JANUARY 2025
Calibration Date : 27-29 JANUARY 2025
Date of Issue : 30 JANUARY 2025

REVIEW BY: *Sut S*
APPROVED BY: *Sut S*
NEXT CAL DATE: 26/ 01/ 2026

Calibrated by : Nathakorn Pisutpaisan

Approved by : *T. Petchu*
(Thanakul Petchurai)

This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard, may not be reproduced other than in full, except with the prior written approval of the head of Calibration Laboratory.

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CALIBRATION LABORATORY

Cert. No. : ACL25112
Job No. : VC68AC0064
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).

The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.

For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL-BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL-BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL-BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KAI	34560495	AA-3001-24	05-FEB-25

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

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

3.1 National Institute of Metrology (Thailand).

3.2 Thailand Institute of Scientific and Technological Research (TISTR).

T. Petchu

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CALIBRATION LABORATORY

Cert. No. : ACL25112
Job No. : VC68AC0064
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	0.3	1.0
5. Frequency and time weightings at 1 kHz	0.2	0.2
6. Long - term stability	0.1	0.1
7. Level linearity on the reference level range	0.2	0.3
8. Level linearity including the level range control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

T. Petchu

Cert. No. : ACL25112
Job No. : VC68AC0064
Page : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
14.8

2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency Weighting	Weighting (dB)
A - weight	11.3
C - weight	18.9
Flat	24.4

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 84 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.3	0.3	0.3	± 1.5
1000	0.1	0.1	0.1	± 1.0
8000	0.6	0.6	0.6	±5.0

Cert. No. : ACL25112
Job No. : VC68AC0064
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	0.1	0.1	±2.0
125	0.1	0.1	0.1	±1.5
250	0.1	0.1	0.0	±1.5
500	0.0	0.1	0.0	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.1	0.0	±2.0
4000	0.0	0.0	0.0	±3.0
8000	0.0	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.2
C - weight	94.0	94.0	0.0	± 0.2
Flat	94.0	94.0	0.0	± 0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	94.0	0.0	± 0.1
Slow	94.0	94.0	0.0	± 0.1
Leq	94.0	94.0	0.0	± 0.1

6. Long - term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.1	0.1	± 0.3

Cert. No. : ACL25112
Job No. : VC68AC0064
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	± 1.1
136.0	136.0	0.0	± 1.1
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	133.0	0.0	± 1.1
132.0	132.0	0.0	± 1.1
131.0	131.0	0.0	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.0	0.0	± 1.1
114.0	114.0	0.0	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.0	0.0	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.0	0.0	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	39.0	0.0	± 1.1
34.0	34.0	0.0	± 1.1
30.0	30.1	0.1	± 1.1
29.0	29.0	0.0	± 1.1
28.0	28.1	0.1	± 1.1
27.0	27.1	0.1	± 1.1
26.0	26.2	0.2	± 1.1
25.0	25.1	0.1	± 1.1

Cert. No. : ACL25112
Job No. : VC68AC0064
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	29.1	0.1	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.1	0.1	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.1	0.1	±1.0

Cert. No. : ACL25112
Job No. : VC68AC0064
Pages : 8 of 8

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Lcpeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	±3.0
One	133.4	133.4	0.0	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.1	-0.3	±2.0

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.6	89.6	0.0	±1.5

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	137.0	137.0	0.0	±0.3

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor $k = 2$
or any value following calculation, providing a level of confidence of approximately 95 %

End of Calibration Certificate

T. Petch.

Cert. No. : ACL25078
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42A / Microphone UC-52 / Preamplifier NH-24
Serial No. : 00623393 / 198640 / 26421
ID No. : RYG_FS0618

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location : -
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

Received Date : 07 JANUARY 2025
Calibration Date : 21 - 23 JANUARY 2025
Date of Issue : 24 JANUARY 2025

REVIEW BY : S.T.S.
APPROVED BY : T. Petch.
NEXT CAL DATE : 20/ 01/ 2026

Calibrated by : Nathakorn Pisutpaisan

Approved by : T. Petch.
(Thanakul Petchurai)

This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard, may not be reproduced
other than in full, except with the prior written approval of the head of Calibration Laboratory.

Cert. No. : ACL25078
Job No. : VC68AC0059
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference
Standard Instruments.
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL_BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL_BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL_BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KAI	34560495	AA-3001-24	05-FEB-25

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

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

- 3.1 National Institute of Metrology (Thailand).
- 3.2 Thailand Institute of Scientific and Technological Research (TISTR).

T. Petch.

Cert. No. : ACL25078
Job No. : VC68AC0059
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	0.3	1.0
5. Frequency and time weightings at 1 kHz	0.2	0.2
6. Long - term stability	0.1	0.1
7. Level linearity on the reference level range	0.2	0.3
8. Level linearity including the level range control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

T. Petch.

Cert. No. : ACL25078
Job No. : VC68AC0059
Page : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
16.6

2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency Weighting	Weighting (dB)
A - weight	13.1
C - weight	17.9
Flat	24.4

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 84 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.5	0.5	0.5	± 1.5
1000	0.1	0.1	0.1	± 1.0
8000	2.3	2.2	2.3	±5.0

Cert. No. : ACL25078
Job No. : VC68AC0059
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	-0.1	-0.1	±2.0
125	0.0	0.0	0.0	±1.5
250	0.0	0.0	-0.1	±1.5
500	0.0	0.0	-0.1	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.0	0.0	±2.0
4000	0.0	0.0	0.0	±3.0
8000	0.0	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.2
C - weight	94.0	94.0	0.0	± 0.2
Flat	94.0	94.0	0.0	± 0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	94.0	0.0	± 0.1
Slow	94.0	94.0	0.0	± 0.1
Leq	94.0	94.0	0.0	± 0.1

6. Long - term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.3

Cert. No. : ACL25078
Job No. : VC68AC0059
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	± 1.1
136.0	136.0	0.0	± 1.1
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	133.0	0.0	± 1.1
132.0	132.0	0.0	± 1.1
131.0	131.0	0.0	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.0	0.0	± 1.1
114.0	114.0	0.0	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.0	0.0	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.0	0.0	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	39.0	0.0	± 1.1
34.0	34.0	0.0	± 1.1
30.0	30.0	0.0	± 1.1
29.0	29.0	0.0	± 1.1
28.0	28.0	0.0	± 1.1
27.0	26.9	-0.1	± 1.1
26.0	25.9	-0.1	± 1.1
25.0	24.9	-0.1	± 1.1

Cert. No. : ACL25078
Job No. : VC68AC0059
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	28.9	-0.1	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.1	0.1	±1.0

Cert. No. : ACL25078
Job No. : VC68AC0059
Pages : 8 of 8

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L _{peak} (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	±3.0
One	133.4	133.4	0.0	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

11. Overload indication

Measured value (dB)		Deviated Value	Acceptance Limits
Positive one-half cycle	Negative one-half cycle	(dB)	(dB)
89.5	89.5	0.0	±1.5

12. High level stability

Frequency	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Weighting				
A - weight	137.0	137.0	0.0	±0.3

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor $k = 2$
or any value following calculation, providing a level of confidence of approximately 95 %

End of Calibration Certificate

T. Petchurai

Cert. No. : ACL25079
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42A / Microphone UC-52 / Preamplifier NH-24
Serial No. : 00623394 / 198641 / 26422
ID No. : RYG_FS0619

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location :
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

Received Date : 07 JANUARY 2025
Calibration Date : 21 - 23 JANUARY 2025
Date of Issue : 24 JANUARY 2025

Calibrated by :

Nathakorn Pisutpaisan

Approved by :

T. Petchurai
(Thanakul Petchurai)

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other than in full, except with the prior written approval of the head of Calibration Laboratory.

Cert. No. : ACL25079
Job No. : VC68AC0059
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference
Standard Instruments.
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL-BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL-BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL-BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KAI	34560495	AA-3001-24	05-FEB-25

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

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

- 3.1 National Institute of Metrology (Thailand).
- 3.2 Thailand Institute of Scientific and Technological Research (TISTR).

T. Petchurai

Cert. No. : ACL25079
Job No. : VC68AC0059
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	0.3	1.0
5. Frequency and time weightings at 1 kHz	0.2	0.2
6. Long - term stability	0.1	0.1
7. Level linearity on the reference level range	0.2	0.3
8. Level linearity including the level range control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

T. Petchurai

Cert. No. : ACL25079
Job No. : VC68AC0059
Page : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
14.6

2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency Weighting	Weighting (dB)
A - weight	12.6
C - weight	19.1
Flat	24.5

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 84 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.4	0.4	0.4	± 1.5
1000	0.1	0.1	0.1	± 1.0
8000	0.1	0.1	0.1	±5.0

Cert. No. : ACL25079
Job No. : VC68AC0059
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	-0.1	0.0	±2.0
125	0.0	0.0	0.0	±1.5
250	0.0	0.0	0.0	±1.5
500	0.0	0.0	0.0	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.0	0.0	±2.0
4000	0.0	0.0	0.0	±3.0
8000	0.0	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.2
C - weight	94.0	94.0	0.0	± 0.2
Flat	94.0	94.0	0.0	± 0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	94.0	0.0	± 0.1
Slow	94.0	94.0	0.0	± 0.1
Leq	94.0	94.0	0.0	± 0.1

6. Long - term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.3

Cert. No. : ACL25079
Job No. : VC68AC0059
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	± 1.1
136.0	136.0	0.0	± 1.1
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	133.0	0.0	± 1.1
132.0	132.0	0.0	± 1.1
131.0	131.0	0.0	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.0	0.0	± 1.1
114.0	114.0	0.0	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.0	0.0	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.0	0.0	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	39.0	0.0	± 1.1
34.0	34.1	0.1	± 1.1
30.0	30.1	0.1	± 1.1
29.0	29.1	0.1	± 1.1
28.0	28.1	0.1	± 1.1
27.0	27.1	0.1	± 1.1
26.0	26.1	0.1	± 1.1
25.0	25.1	0.1	± 1.1

Cert. No. : ACL25079
Job No. : VC68AC0059
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	28.9	-0.1	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

Cert. No. : ACL25079
Job No. : VC68AC0059
Pages : 8 of 8

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Lepeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	±3.0
One	133.4	133.3	-0.1	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	132.9	-0.1	±2.0
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.1	-0.3	±2.0

11. Overload indication

Measured value (dB)		Deviated Value	Acceptance Limits
Positive one-half cycle	Negative one-half cycle	(dB)	(dB)
89.5	89.6	0.1	±1.5

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	137.0	137.0	0.0	±0.3

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor $k = 2$
or any value following calculation, providing a level of confidence of approximately 95 %

End of Calibration Certificate

*T. Petchurai*Cert. No. : ACL25073
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No. : 01222716 / 143832 / 22763
ID No. : RYG_FS0020

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location :
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

Received Date : 07 JANUARY 2025
Calibration Date : 21 - 23 JANUARY 2025
Date of Issue : 24 JANUARY 2025

REVIEW BY	<i>Spt.S</i>
APPROVED BY	<i>T. Petchurai</i>
NEXT CAL DATE	21/01/2026

Calibrated by : Nathakorn Pisutpaisan

Approved by : *T. Petchurai*
(Thanakul Petchurai)

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Cert. No. : ACL25073
Job No. : VC68AC0059
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference
Standard Instruments.
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL_BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL_BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL_BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KAI	34560495	AA-3001-24	05-FEB-25

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

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

- 3.1 National Institute of Metrology (Thailand).
- 3.2 Thailand Institute of Scientific and Technological Research (TISTR).

*T. Petchurai*Cert. No. : ACL25073
Job No. : VC68AC0059
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	0.3	1.0
5. Frequency and time weightings at 1 kHz	0.2	0.2
6. Long - term stability	0.1	0.1
7. Level linearity on the reference level range	0.2	0.3
8. Level linearity including the level range control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

T. Petchurai

Cert. No. : ACL25073
Job No. : VC68AC0059
Page : 4 of 8**Result of calibration :****1. Absolute sensitivity**

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

2. Self-generated noise**2.1 Normal test**

Measured Value (dB)
13.4

2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency Weighting	Weighting (dB)
A - weight	10.8
C - weight	16.7
Flat	22.6

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 84 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	-0.2	-0.2	-0.2	± 1.5
1000	-0.6	-0.6	-0.6	± 1.0
8000	-1.0	-1.0	-1.0	±5.0

Cert. No. : ACL25073
Job No. : VC68AC0059
Pages : 5 of 8**4. Electrical signal tests of frequency weightings**

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.2	0.2	0.3	±2.0
125	0.2	0.2	0.2	±1.5
250	0.1	0.1	0.1	±1.5
500	0.1	0.1	0.1	±1.5
1000	0.0	0.0	0.1	±1.0
2000	0.0	0.0	0.0	±2.0
4000	-0.1	-0.1	0.0	±3.0
8000	-0.1	0.0	0.0	±5.0

5. Frequency and time weightings at 1 kHz**5.1 Frequency weightings at 1 kHz**

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.2
C - weight	94.0	94.0	0.0	± 0.2
Flat	94.0	94.0	0.0	± 0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	94.0	0.0	± 0.1
Slow	94.0	94.0	0.0	± 0.1
Leq	94.0	94.0	0.0	± 0.1

6. Long - term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.3

Cert. No. : ACL25073
Job No. : VC68AC0059
Pages : 6 of 8**7. Level linearity on the reference level range**

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	140.0	3.0	± 1.1
136.0	140.0	4.0	± 1.1
135.0	140.0	5.0	± 1.1
134.0	140.0	6.0	± 1.1
133.0	133.1	0.1	± 1.1
132.0	132.1	0.1	± 1.1
131.0	131.1	0.1	± 1.1
129.0	129.1	0.1	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.1	0.1	± 1.1
114.0	114.1	0.1	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.1	0.1	± 1.1
99.0	99.1	0.1	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.0	0.0	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	39.0	0.0	± 1.1
34.0	34.0	0.0	± 1.1
30.0	30.1	0.1	± 1.1
29.0	29.1	0.1	± 1.1
28.0	28.2	0.2	± 1.1
27.0	27.1	0.1	± 1.1
26.0	26.2	0.2	± 1.1
25.0	25.3	0.3	± 1.1

Cert. No. : ACL25073
Job No. : VC68AC0059
Pages : 7 of 8**8. Level linearity including the level range control**

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	29.2	0.2	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.1	0.1	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

Cert. No. : ACL25073
Job No. : VC68AC0059
Pages : 8 of 8

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L _{peak} (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	±3.0
One	133.4	133.4	0.0	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	132.9	-0.1	±2.0
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.1	-0.3	±2.0

11. Overload indication

Measured value (dB)		Deviated Value	Acceptance Limits
Positive one-half cycle	Negative one-half cycle	(dB)	(dB)
89.6	89.5	-0.1	±1.5

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	137.0	137.0	0.0	±0.3

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor $k = 2$
or any value following calculation, providing a level of confidence of approximately 95 %

End of Calibration Certificate

T. Petchur

Cert. No. : ACL25086
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No. : 01122578 / 143842 / 74027
ID No. : RYG_FS0017

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location : -
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

Received Date : 07 JANUARY 2025
Calibration Date : 27 JANUARY 2025
Date of Issue : 28 JANUARY 2025

Calibrated by :

Nathakorn Pisutpaisan

Approved by :

T. Petchur
(Thanakul Petchurai)

This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard, may not be reproduced
other than in full, except with the prior written approval of the head of Calibration Laboratory.

Cert. No. : ACL25086
Job No. : VC68AC0059
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference
Standard Instruments.
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL_BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL_BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL_BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KAI	34560495	AA-3001-24	05-FEB-25

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

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

- 3.1 National Institute of Metrology (Thailand).
- 3.2 Thailand Institute of Scientific and Technological Research (TISTR).

T. Petchur

Cert. No. : ACL25086
Job No. : VC68AC0059
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	0.3	1.0
5. Frequency and time weightings at 1 kHz	0.2	0.2
6. Long - term stability	0.1	0.1
7. Level linearity on the reference level range	0.2	0.3
8. Level linearity including the level range control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

T. Petchur

Cert. No. : ACL25086
Job No. : VC68AC0059
Page : 4 of 8

Result of calibration :**1. Absolute sensitivity**

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

2. Self-generated noise**2.1 Normal test**

Measured Value (dB)
17.6

2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency Weighting	Weighting (dB)
A - weight	11.6
C - weight	17.5
Flat	23.3

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 84 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.5	0.5	0.5	± 1.5
1000	0.1	0.1	0.1	± 1.0
8000	0.2	0.2	0.2	±5.0

Cert. No. : ACL25086
Job No. : VC68AC0059
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	-0.1	0.1	±2.0
125	0.0	0.0	0.0	±1.5
250	0.0	0.0	0.0	±1.5
500	0.0	0.0	0.0	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.0	0.0	±2.0
4000	0.0	0.0	0.0	±3.0
8000	0.0	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz**5.1 Frequency weightings at 1 kHz**

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.2
C - weight	94.0	94.0	0.0	± 0.2
Flat	94.0	94.0	0.0	± 0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	94.0	0.0	± 0.1
Slow	94.0	94.0	0.0	± 0.1
Leq	94.0	94.0	0.0	± 0.1

6. Long - term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.3

Cert. No. : ACL25086
Job No. : VC68AC0059
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	± 1.1
136.0	136.0	0.0	± 1.1
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	133.0	0.0	± 1.1
132.0	132.0	0.0	± 1.1
131.0	131.0	0.0	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.0	0.0	± 1.1
114.0	114.0	0.0	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.0	0.0	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	78.9	-0.1	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	63.9	-0.1	± 1.1
59.0	59.0	0.0	± 1.1
54.0	53.9	-0.1	± 1.1
49.0	48.9	-0.1	± 1.1
44.0	43.9	-0.1	± 1.1
39.0	38.9	-0.1	± 1.1
34.0	34.0	0.0	± 1.1
30.0	30.0	0.0	± 1.1
29.0	29.0	0.0	± 1.1
28.0	28.0	0.0	± 1.1
27.0	27.1	0.1	± 1.1
26.0	26.1	0.1	± 1.1
25.0	25.2	0.2	± 1.1

Cert. No. : ACL25086
Job No. : VC68AC0059
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	28.9	-0.1	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

Cert. No. : ACL25086
Job No. : VC68AC0059
Pages : 8 of 8

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L _{peak} (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	±3.0
One	133.4	133.3	-0.1	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.6	89.5	-0.1	±1.5

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	137.0	137.0	0.0	±0.3

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor $k = 2$
or any value following calculation, providing a level of confidence of approximately 95 %

End of Calibration Certificate

Signature

Certificate of Calibration

Customer

Name : ALS Laboratory Group Thailand Co., Ltd.
Address : 104 Soi Phatthanasak 40, Phatthanasak Road, Suan Luang, Bangkok 10250Certificate No : 25-SLM-114
Request No : Req-2025-0001

Unit Under Calibration Details

Measurement item : Sound Level Meter
Manufacturer : RION
Model : NL-42
Serial Number : 01222723
ID : RYG-F50022
Resolution : 0.1 dBMicrophone Class : 2
Microphone Model : UC-52
Microphone SN : 143841
Preamplifier Model : NH-24
Preamplifier S/N : 22770
Instrument Status : Used

Calibration Environment and Details

Temperature : 23 °C ± 2 °C
Humidity : 50 %RH ± 20 %RH
Barometric Pressure : 1013 hPa ± 10 hPa
Received Date : 6 March 2025
Calibrated Date : 19 March 2025Calibration Procedure : In-house method CP-SLM-01 based on IEC 61672-3 : 2013 Electroacoustics - Sound level meters - Part 3: Periodic tests
Location of Calibration : Lab Acoustic

Reference Standard

Instrument	Brand	Model	SN	Due calibration	Traceability
Standard Microphone	Briel & Kjaer	4192	2294985	25 June 2025	NIMT
Audio Generator	Svsmek	Svsm101	131	15 October 2025	WK Electric

Note

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor $k = 2$, providing a level of confidence approximately 95 %Calibrated By : *Signature*
Mr. Noppadol Luangrat
Service Calibration EngineerApproved By : *Signature*
Mr. Pasi Mahavorn
Calibration Engineer Supervisor
Issue Date : 19 March 2025

The results related only to the item calibrated. The certificate shall not be reproduced (except in full, without written approval of the Innovative Instrument Co., Ltd.)

FM-700-SLM-01 Rev 04 Issue date 5-0-25



Page: 2/7

Certificate No : 25-SLM-114
Request No : Req-2025-0001

1. Indication at the calibration check frequency

UUC Setting	Nominal Level	Before Adjust		After Adjust		UNCERTAINTY (± dB)	Acceptance Limit (± dB)	Result
		UUC (dB)	ERR (dB)	UUC (dB)	ERR (dB)			
Calibrator Setting	(dB)	(dB)	(dB)	(dB)	(dB)	(± dB)	(± dB)	
1000 Hz 94 dB	94.06	94.0	-0.06	94.1	+0.04	0.20	0.30	Pass

Note : Absolute sensitivity was established by the use of Sound Calibrator Brand RION, Model NC-75, SN:3502736

2. Self-generated noise, Microphone installed

UUC Setting	Measured	UNCERTAINTY
FAST / 30-130		
UUC Weighting	(dB)	(± dB)
A	15.4	0.10

3. Self-generated noise, Microphone replaced by the electrical input signal device

UUC Setting	Measured	UNCERTAINTY
FAST / 30-130		
UUC Weighting	(dB)	(± dB)
A	12.2	0.10
C	16.6	0.10
Z	20.4	0.10

4. Acoustic signal test of frequency weightings (Without Windscreen)

UUC Setting	Deviation from various Frequency Weighting Response curve			UNCERTAINTY (± dB)	Acceptance Limit (± dB)	Result
	A	C	Z			
FAST / 30-130	(dB)	(dB)	(dB)	(± dB)	(± dB)	
STD Setting	(dB)	(dB)	(dB)	(± dB)	(± dB)	
125 Hz	0.3	0.5	0.5	0.60	1.5	Pass
1000 Hz	0.0	0.0	0.0	0.60	1.0	Pass
4000 Hz	0.4	0.4	0.4	0.60	3.0	Pass
8000 Hz	-1.3	-1.3	-1.3	0.70	5.0	Pass



Page: 3/7

Certificate No : 25-SLM-114
Request No : Req-2025-0001

5. Electrical signal test of frequency weightings, Weighting network response with relative to 1 kHz

UUC Setting	Deviation from various Frequency Weighting Response curve			UNCERTAINTY (± dB)	Acceptance Limit (± dB)	Result
	A (dB)	C (dB)	Z (dB)			
FAST / 30-130	(dB)	(dB)	(dB)	(± dB)	(± dB)	
STD Setting	(dB)	(dB)	(dB)	(± dB)	(± dB)	
63 Hz	-0.1	0.0	0.0	0.20	2.0	Pass
125 Hz	-0.1	0.0	0.0		1.5	Pass
250 Hz	0.0	0.0	0.0		1.5	Pass
500 Hz	0.0	0.1	0.0		1.5	Pass
1000 Hz	0.0	0.0	0.0		1.0	Pass
2000 Hz	0.0	0.1	0.0		2.0	Pass
4000 Hz	0.0	0.0	0.0		3.0	Pass
8000 Hz	0.1	0.1	0.0		5.0	Pass
16000 Hz	-1.3	-1.3	0.0		>5.0 (Inf)	Pass

6. Frequency and time weightings at 1kHz

UUC Setting	STD REF	Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)	Result
		UUC (dB)	ERR (dB)			
FAST / 30-130	(dB)	(dB)	(dB)	(± dB)	(± dB)	
UUC Weighting	(dB)	(dB)	(dB)	(± dB)	(± dB)	
A	114.00	114.0	0.0	0.20	0.20	Pass
C	114.00	114.0	0.0		0.20	Pass
Z	114.00	114.0	0.0		0.20	Pass

UUC Setting	STD REF	Measured		UNCERTAINTY (± dB)	Acceptance Limit (± dB)	Result
		UUC (dB)	ERR (dB)			
30-130 / A	(dB)	(dB)	(dB)	(± dB)	(± dB)	
UUC Time Response	(dB)	(dB)	(dB)	(± dB)	(± dB)	
Fast	114.00	114.0	0.0	0.20	0.10	Pass
Slow	114.00	114.0	0.0		0.10	Pass
Eq	114.00	114.0	0.0		0.10	Pass

The results related only to the item calibrated. The certificate shall not be reproduced (except in full, without written approval of the Innovative Instrument Co., Ltd.)

FM-700-SLM-01 Rev 04 Issue date 5-0-25

The results related only to the item calibrated. The certificate shall not be reproduced (except in full, without written approval of the Innovative Instrument Co., Ltd.)

FM-700-SLM-01 Rev 04 Issue date 5-0-25

Certificate No : 25-SLM-114

Request No : Req-2025-0601

7. Long Term Stability

UUC Setting	Measured	UNCERTAINTY	Acceptance	Result
FAST / A / 30-130	UUC	(\pm dB)	Limit	
STD Setting	(dB)		(\pm dB)	
Initial	114.0			
Final	114.0			
Deviated	0.0	0.10	0.30	Pass

8. Level linearity on the reference level range

UUC Setting	Anticipated	Deviation	UNCERTAINTY	Acceptance	Result
FAST / A / 30-130	REF	UUC	ERR	Limit	
STD dB	(dB)	(dB)	(dB)	(\pm dB)	
135.00	135	137.9	-0.1	1.1	Pass
134.00	134	138.0	0.0	1.1	Pass
129.00	129	129.0	0.0	1.1	Pass
124.00	124	124.0	0.0	1.1	Pass
119.00	119	119.0	0.0	1.1	Pass
114.00	114	114.0	0.0	1.1	Pass
109.00	109	109.0	0.0	1.1	Pass
104.00	104	104.0	0.0	1.1	Pass
99.00	99	99.0	0.0	1.1	Pass
94.00	94	94.0	0.0	1.1	Pass
89.00	89	89.0	0.0	1.1	Pass
84.00	84	84.0	0.0	1.1	Pass
79.00	79	79.0	0.0	1.1	Pass
74.00	74	74.0	0.0	1.1	Pass
69.00	69	69.0	0.0	1.1	Pass
64.00	64	64.0	0.0	1.1	Pass
59.00	59	59.0	0.0	1.1	Pass
54.00	54	54.0	0.0	1.1	Pass
49.00	49	49.0	0.0	1.1	Pass
44.00	44	44.0	0.0	1.1	Pass
39.00	39	39.0	0.0	1.1	Pass
34.00	34	34.0	0.0	1.1	Pass
29.00	29	29.1	0.1	1.1	Pass
24.00	24	24.0	0.0	1.1	Pass

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

FM-709-SLM-01 Rev.01 Issue date: 5-0-20

Certificate No : 25-SLM-114

Request No : Req-2025-0601

9. Level linearity including the level range control

UUC Setting	STD	Measured	UNCERTAINTY	Acceptance	Result
FAST / A	REF	UUC	ERR	Limit	
UUC Range	(dB)	(dB)	(dB)	(\pm dB)	
30-130	29.50	-29.7	0.2	1.1	Pass
	-114	114.0	0.0	1.1	Pass

10. Tone burst response

UUC Setting	STD	Anticipated	Measured	UNCERTAINTY	Acceptance	Result
A / 30-130	Toneburst	Ref	UUC	ERR	Limit	
UUC Time Response	(ms)	(dB)	(dB)	(dB)	(\pm dB)	
Fast	200	126.0	126.1	-0.1	1.0	Pass
	2	109.0	109.0	0.0	+1.0, -2.5	Pass
	0.25	100.0	99.9	-0.1	+1.5, -5.0	Pass
Slow	200	119.6	119.6	0.0	1.0	Pass
	2	100.0	100.0	0.0	+1.0, -5.0	Pass
SEL	200	120.0	120.0	0.0	1.0	Pass
	2	100.0	100.0	0.0	+1.0, -2.5	Pass
	0.25	91.0	90.9	-0.1	+1.5, -5.0	Pass

11. Peak C Sound level

UUC Setting	Anticipated	Measured	UNCERTAINTY	Acceptance	Result
FAST / C / 55-141	REF	UUC	ERR	Limit	
STD Setting	(dB)	(dB)	(dB)	(\pm dB)	
Complete cycle	136.4	135.8	-0.60	3.0	Pass
Positive half cycle	135.4	135.2	-0.20	2.0	Pass
Negative half cycle	135.4	135.2	-0.20	2.0	Pass

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

FM-709-SLM-01 Rev.01 Issue date: 5-0-20

Certificate No : 25-SLM-114

Request No : Req-2025-0601

12. Overload indication

UUC Setting	Measured	UNCERTAINTY	Acceptance	Result
FAST / A / 30-130	UUC	(\pm dB)	Limit	
STD Setting	(dB)		(\pm dB)	
Positive one-half cycle	139.5			
Negative one-half cycle	139.4			
Deviated	0.1	0.20	1.5	Pass

13. High Level Stability

UUC Setting	Measured	UNCERTAINTY	Acceptance	Result
FAST / A / 30-130	UUC	(\pm dB)	Limit	
STD Setting	(dB)		(\pm dB)	
Initial	129.0			
Final	129.0			
Deviated	0.0	0.10	0.30	Pass

Note :

Function	Maximum-permitted Uncertainty of measurement
1. Indication at the calibration check frequency	Not applicable
2. Self-generated noise, Microphone installed	Not applicable
3. Self-generated noise, Microphone replaced by the electrical input signal device	Not applicable
4. Acoustic signal test of frequency weightings at 10 Hz to 4 kHz	0.60 dB
4. Acoustic signal test of frequency weightings at 4 kHz to 10 kHz	0.70 dB
5. Electrical signal test of frequency weightings, Weighting network response with relative to 1 kHz	0.20 dB
6. Frequency and time weightings at 1 kHz	0.20 dB
7. Long Term Stability	0.10 dB
8. Level linearity on the reference level range	0.30 dB
9. Level linearity including the level range control	0.30 dB
10. Tone burst response	0.30 dB
11. Peak C Sound level	0.35 dB
12. Overload indication	0.25 dB
13. High Level Stability	0.10 dB

- Acceptance limit and Maximum-permitted Uncertainty was IEC 61072-1:2013

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

FM-709-SLM-01 Rev.01 Issue date: 5-0-20

Certificate No : 25-SLM-114

Request No : Req-2025-0601

Decision Rule for Statements of Conformity

The standard decision rule employed for the statements of conformity to each calibration result will be applied using ILAC-G8:09/2019: Guidelines on the

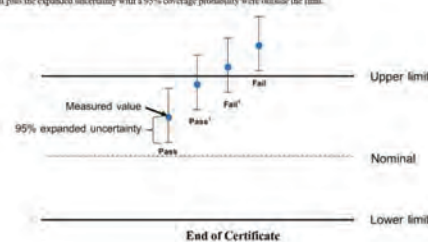
Reporting of Compliance with Specifications as following Fig. and statements

Pass¹ - The measurement result plus the expanded uncertainty with a 95% coverage probability were within the limit.

Pass² - The measurement result was within the limit. However, a portion of the expanded uncertainty of measurement at 95% exceeds the limit.

Fail¹ - The measurement result was out of the limit. However, a portion of the expanded uncertainty of measurement at 95% is within the limit.

Fail² - The measurement result plus the expanded uncertainty with a 95% coverage probability were outside the limit.



The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

FM-709-SLM-01 Rev.01 Issue date: 5-0-20

Cert. No. : ACL25074
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No.: 00233183 / 157777 / 22653
ID No.: RYG_FS0024


Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location : -
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

Received Date : 07 JANUARY 2025
Calibration Date : 21 - 23 JANUARY 2025
Date of Issue : 24 JANUARY 2025

Calibrated by : Nathakorn Pisutpaisan

Approved by : 
(Thanakul Petchurai)

This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard, may not be reproduced
other than in full, except with the prior written approval of the head of Calibration Laboratory.

Cert. No. : ACL25074
Job No. : VC68AC0059
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference
Standard Instruments.
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL.BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL.BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL.BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KAI	34560495	AA-3001-24	05-FEB-25

2. This result of calibration was found accurate as shown on date and place of calibration for this calibrated item only.
3. This certificate is traceable to the international system of unit maintained at :
3.1 National Institute of Metrology (Thailand).
3.2 Thailand Institute of Scientific and Technological Research (TISTR).

Cert. No. : ACL25074
Job No. : VC68AC0059
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	0.3	1.0
5. Frequency and time weightings at 1 kHz	0.2	0.2
6. Long - term stability	0.1	0.1
7. Level linearity on the reference level range	0.2	0.3
8. Level linearity including the level range control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

Cert. No. : ACL25074
Job No. : VC68AC0059
Page : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
18.2

2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency Weighting	Weighting (dB)
A - weight	13.1
C - weight	19.2
Flat	24.9

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 84 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.7	0.7	0.7	± 1.5
1000	0.0	0.0	0.0	± 1.0
8000	0.0	0.0	0.0	± 5.0

Cert. No. : ACL25074
Job No. : VC68AC0059
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	-0.1	0.0	±2.0
125	0.0	0.0	0.0	±1.5
250	0.0	0.0	0.0	±1.5
500	0.0	0.0	-0.1	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.0	0.0	±2.0
4000	0.0	0.0	0.0	±3.0
8000	0.0	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.2
C - weight	94.0	94.0	0.0	± 0.2
Flat	94.0	94.0	0.0	± 0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	94.0	0.0	± 0.1
Slow	94.0	94.0	0.0	± 0.1
Leq	94.0	94.0	0.0	± 0.1

6. Long - term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.3

T. Petch.

Cert. No. : ACL25074
Job No. : VC68AC0059
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	± 1.1
136.0	136.0	0.0	± 1.1
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	132.9	-0.1	± 1.1
132.0	131.9	-0.1	± 1.1
131.0	130.9	-0.1	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.0	0.0	± 1.1
114.0	114.0	0.0	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.0	0.0	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.0	0.0	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	39.0	0.0	± 1.1
34.0	34.1	0.1	± 1.1
30.0	30.1	0.1	± 1.1
29.0	29.1	0.1	± 1.1
28.0	28.1	0.1	± 1.1
27.0	27.1	0.1	± 1.1
26.0	26.2	0.2	± 1.1
25.0	25.2	0.2	± 1.1

T. Petch.

Cert. No. : ACL25074
Job No. : VC68AC0059
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	29.1	0.1	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

T. Petch.

Cert. No. : ACL25074
Job No. : VC68AC0059
Pages : 8 of 8

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L _{peak} (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	±3.0
One	133.4	133.4	0.0	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.5	89.5	0.0	±1.5

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	137.0	137.0	0.0	±0.3

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor $k = 2$

or any value following calculation, providing a level of confidence of approximately 95 %

End of Calibration Certificate

T. Petch.

Cert. No. : ACL25087
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No.: 00734220 / 157226 / 34371
ID No.: RYG_FS0026

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAEANG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location : -
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

Received Date : 07 JANUARY 2025
Calibration Date : 27 JANUARY 2025
Date of Issue : 28 JANUARY 2025

Calibrated by : Nathakorn Pisutpaisan

Approved by : 
(Thanakul Petchurai)

This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard, may not be reproduced other than in full, except with the prior written approval of the head of Calibration Laboratory.

Cert. No. : ACL25087
Job No. : VC68AC0059
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL.BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL.BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL.BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KAI	34560495	AA-3001-24	05-FEB-25

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

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

- 3.1 National Institute of Metrology (Thailand).
3.2 Thailand Institute of Scientific and Technological Research (TISTR).

Cert. No. : ACL25087
Job No. : VC68AC0059
Pages : 3 of 8**Summary of Measurement Result :**

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	0.3	1.0
5. Frequency and time weightings at 1 kHz	0.2	0.2
6. Long - term stability	0.1	0.1
7. Level linearity on the reference level range	0.2	0.3
8. Level linearity including the level range control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

Cert. No. : ACL25087
Job No. : VC68AC0059
Page : 4 of 8**Result of calibration :****1. Absolute sensitivity**

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

2. Self-generated noise**2.1 Normal test**

Measured Value (dB)
13.1

2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency Weighting	Weighting (dB)
A - weight	9.8
C - weight	16.2
Flat	22.1

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 84 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	1.5	1.5	1.5	± 1.5
1000	0.1	0.1	0.1	± 1.0
8000	-4.2	-4.2	-4.2	±5.0

Cert. No. : ACL25087
Job No. : VC68AC0059
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	-0.1	-0.1	0.0	±2.0
125	0.0	0.0	0.0	±1.5
250	0.0	-0.1	-0.1	±1.5
500	0.0	0.0	-0.1	±1.5
1000	0.0	0.0	0.0	±1.0
2000	-0.1	0.0	0.0	±2.0
4000	-0.1	0.0	-0.1	±3.0
8000	-0.1	0.0	-0.1	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.2
C - weight	94.0	94.0	0.0	± 0.2
Flat	94.0	94.0	0.0	± 0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	94.0	0.0	± 0.1
Slow	94.0	93.9	-0.1	± 0.1
Leq	94.0	94.0	0.0	± 0.1

6. Long - term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.1	0.1	± 0.3

T. Petch

Cert. No. : ACL25087
Job No. : VC68AC0059
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	± 1.1
136.0	136.0	0.0	± 1.1
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	133.0	0.0	± 1.1
132.0	132.0	0.0	± 1.1
131.0	131.0	0.0	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.0	0.0	± 1.1
114.0	114.0	0.0	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.1	0.1	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.0	0.0	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	39.0	0.0	± 1.1
34.0	34.0	0.0	± 1.1
30.0	30.0	0.0	± 1.1
29.0	29.0	0.0	± 1.1
28.0	28.0	0.0	± 1.1
27.0	27.0	0.0	± 1.1
26.0	26.0	0.0	± 1.1
25.0	25.0	0.0	± 1.1

T. Petch

Cert. No. : ACL25087
Job No. : VC68AC0059
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	29.8	0.8	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.1	0.1	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.1	0.1	±1.0

T. Petch

Cert. No. : ACL25087
Job No. : VC68AC0059
Pages : 8 of 8

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L _{Cpeak} (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	±3.0
One	133.4	133.4	0.0	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.1	-0.3	±2.0

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.6	89.5	-0.1	±1.5

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	137.0	137.0	0.0	±0.3

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor $k = 2$

or any value following calculation, providing a level of confidence of approximately 95 %

End of Calibration Certificate

T. Petch

Cert. No. : ACL24282
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No.: 01122567 / 143473 / 22605
ID No.: RYG_FS0016

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location :
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

Received Date : 04 SEPTEMBER 2024
Calibration Date : 19 SEPTEMBER 2024
Date of Issue : 20 SEPTEMBER 2024



Calibrated by : Nathakorn Pisutpaisan

Approved by : *T. Petchurui*
(Thanakul Petchurui)

This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard, may not be reproduced
other than in full, except with the prior written approval of the head of Calibration Laboratory.

Cert. No. : ACL24282
Job No. : VC67AC0148
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference
Standard Instruments.
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL-BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL-BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL-BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KA1	34560495	AA-3001-24	05-FEB-25

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

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

- 3.1 National Institute of Metrology (Thailand).
3.2 Thailand Institute of Scientific and Technological Research (TISTR).

Cert. No. : ACL24282
Job No. : VC67AC0148
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	0.3	1.0
5. Frequency and time weightings at 1 kHz	0.2	0.2
6. Long-term stability	0.1	0.1
7. Level linearity on the reference level range	0.2	0.3
8. Level linearity including the level range control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

Cert. No. : ACL24282
Job No. : VC67AC0148
Page : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
15.4

2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency Weighting	Weighting (dB)
A-weight	12.0
C-weight	18.4
Flat	24.1

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 84 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.1	0.1	0.1	± 1.5
1000	-0.1	-0.1	-0.1	± 1.0
8000	-2.4	-2.4	-2.4	± 5.0

4. Electrical signal tests of frequency weightings

Weighing network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	-0.1	-0.1	-0.1	±2.0
125	-0.1	-0.1	-0.1	±1.5
250	-0.1	0.0	-0.1	±1.5
500	-0.1	0.0	-0.1	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.0	0.0	±2.0
4000	0.0	0.0	0.0	±3.0
8000	0.0	0.0	0.0	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.2
C - weight	94.0	94.0	0.0	± 0.2
Flat	94.0	94.0	0.0	± 0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	94.0	0.0	± 0.1
Slow	94.0	94.0	0.0	± 0.1
Leq	94.0	94.0	0.0	± 0.1

6. Long - term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.1	0.1	± 0.3

T. Petch.

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	± 1.1
136.0	136.1	0.1	± 1.1
135.0	135.1	0.1	± 1.1
134.0	134.1	0.1	± 1.1
133.0	133.0	0.0	± 1.1
132.0	132.0	0.0	± 1.1
131.0	131.0	0.0	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.1	0.1	± 1.1
114.0	114.1	0.1	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.1	0.1	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.0	0.0	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	39.0	0.0	± 1.1
34.0	34.0	0.0	± 1.1
30.0	30.0	0.0	± 1.1
29.0	28.9	-0.1	± 1.1
28.0	28.0	0.0	± 1.1
27.0	27.0	0.0	± 1.1
26.0	26.0	0.0	± 1.1
25.0	24.8	-0.2	± 1.1

T. Petch.

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	30.0	29.9	-0.1	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	116.9	-0.1	1.0 ; -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
	0.25	1	99.0	98.8	-0.2	1.5 ; -5.0
SEL	2	8	108.0	107.9	-0.1	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

T. Petch.

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L _{peak} (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±3.0
One	136.4	136.0	-0.4	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.1	-0.3	±2.0

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.6	89.6	0.0	±1.5

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	137.0	137.0	0.0	±0.3

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor $k = 2$
or any value following calculation, providing a level of confidence of approximately 95 %

End of Calibration Certificate

T. Petch.

Certificate of Calibration

Customer

Name : ALS Laboratory Group Thailand Co., Ltd.
Address : 104 Soi Phatthanakan 40, Phatthanakan Road, Suan Luang,
Bangkok 10250
Certificate No : 25-ACT-042
Request No : Roq-2025-0604

Unit Under Calibration Details

Measurement item : Acoustic Calibrator
Manufacturer : RION
Model : NC-75
Serial Number : 35002736
ID : RYG_FS0496
Class : J
Range : 94 dB / 1000 Hz
Instrument Status : Used

Calibration Environment and Details

Temperature : (23 ± 2 °C)
Humidity : (50 ± 20 %RH)
Barometric Pressure : (1013 ± 10.0 hPa)
Received Date : 6 March 2025
Calibration Date : 19 March 2025
Location of Calibration : LAB 1 Acoustic
Calibration Procedure : In-house method CP-ACT-02 based on IEC 60942:2017 Electroacoustics - Sound calibrators


Reference Standard	Model	Serial Number	Traceable	Due Calibration
Sound Calibrator	SV 35A	58079	EEI	12 June 2025
THD Multimeter	2015	1047765	NIMT	4 February 2026

Traceability : This certificate provides traceability of measurement to recognized national standard, and to the realization of the international System of Units (SI).

Note

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor $k=2$, providing a level of confidence approximately 95 %.

Calibrated By : 
Mr. Noppadon Luangart
Service Calibration Engineer

Approved By : 
Mr. Pacit Mathayom
Calibration Engineer Supervisor
Issue Date : 19 March 2025

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

FM-708-ACT-02 Rev.03 Issue date 5/6/24

Certificate No : 25-ACT-042
Request No : Roq-2025-0604

Sound pressure level

Calibration Results : Without Adjustment

Calibration Range (dB)	Without Adjustment (dB)		Adjustment (dB)		Uncertainty (± dB)	Acceptance limit Class 1 (± dB)	Result
	Measured	Deviated value	Measured	Deviated value			
94 dB / 1000 Hz	94.06	0.06	-	-	0.13	0.25	Pass

Frequency of Sound pressure level

Calibration Range (Hz)	Without Adjustment		Adjustment		Uncertainty (± %)	Acceptance limit Class 1 (± %)	Result
	Measured (Hz)	Deviated	Measured (Hz)	Deviated			
94 dB / 1000 Hz	1000.00	0.00	-	-	0.01	0.70	Pass

Total Harmonic Distortion plus Noise of Sound pressure level (THD+N %)

Calibration Range (Hz)	Without Adjustment	Adjustment	Uncertainty (± %)	Acceptance limit Class I (± %)	Result
	Measured (%)	Measured (%)			
94 dB / 1000 Hz	0.98	-	0.40	2.5	Pass

Note :

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

- Acceptance limit was IEC60942:2017 Class 1
- The calibration results exclude the calibration pressure correction
- The calibration results exclude the microphone volume correction

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

FM-708-ACT-02 Rev.03 Issue date 5/6/24

Certificate No : 25-ACT-042
Request No : Roq-2025-0604

Decision Rule for Statements of Conformity

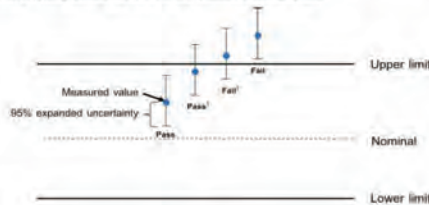
The standard decision rule employed for the statements of conformity to each calibration result will be applied using ILAC-G8:09/2019 Guidelines on the Reporting of Compliance with Specification as following Fig. and statements

Pass - The measurement result plus the expanded uncertainty with a 95% coverage probability were within the limit.

Pass¹ - The measurement result was within the limit. However, a portion of the expanded uncertainty of measurement at 95% exceeds the limit.

Fail¹ - The measurement result was out of the limit. However, a portion of the expanded uncertainty of measurement at 95% is within the limit.

Fail - The measurement result plus the expanded uncertainty with a 95% coverage probability were outside the limit.



End of Calibration

SITHIPORN ASSOCIATES CO., LTD. CALIBRATION LABORATORY

459/45/1 Sathiporn Road, Bangsue, Bangkok, 10700 Thailand
Tel: +66 (0)20 8333 Email: calibration@sithiporn.com

Cert. No. : ACL25337
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No. : 00572561 / 170398 / 72899
ID No. : RYG_FS0300

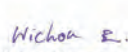
Condition As Found : GOOD



Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location : -
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

Received Date : 07 AUGUST 2025
Calibration Date : 26 AUGUST 2025
Date of Issue : 27 AUGUST 2025

Calibrated by : Nathakorn Pisutpaisan

Approved by : 
(Wichok Ekpongpradit)

REVIEW BY : 
APPROVED BY : 
NEXT CAL DATE : 25/ 08/ 2026

This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard, may not be reproduced other than in full, except with the prior written approval of the head of Calibration Laboratory.

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd.

FM-708-ACT-02 Rev.03 Issue date 5/6/24

Cert. No. : ACL25337
Job No. : VC68AC0168
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0011-25	11-FEB-26
Waveform Generator	33511B	MY52302742	EF-0012-25	11-FEB-26
Digital Multimeter	33461A	MY33220104	EEL-BP 24/0268	22-APR-26
Digital Multimeter	33461A	MY33220076	EEL-BP 23/0268	22-APR-26
Digital Multimeter	34461A	MY60024273	CA2025120EA	18-MAR-26
Programmable Attenuator	MAT-1070	62100114	EF-0006-25	11-FEB-26
Condenser Microphone	4180	2977900	AA-1002-25	19-FEB-26
Measuring Amplifier	NA-42KA1	34560495	AA-3002-25	19-FEB-26

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

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

- 3.1 National Institute of Metrology (Thailand).
- 3.2 Thailand Institute of Scientific and Technological Research (TISTR).
- 3.3 Electrical And Electronics Institute (EEI).

MICHAEL S.

Cert. No. : ACL25337
Job No. : VC68AC0168
Pages : 3 of 8**Summary of Measurement Result :**

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	0.3	1.0
5. Frequency and time weightings at 1 kHz	0.2	0.2
6. Long - term stability	0.1	0.1
7. Level linearity on the reference level range	0.2	0.3
8. Level linearity including the level range control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

MICHAEL S.

Cert. No. : ACL25337
Job No. : VC68AC0168
Page : 4 of 8**Result of calibration :****1. Absolute sensitivity**

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
18.8

2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency Weighting	Weighting (dB)
A - weight	15.4
C - weight	21.3
Flat	27.0

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 84 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.4	0.4	0.4	± 1.5
1000	0.0	0.0	0.0	± 1.0
8000	1.9	2.0	2.0	±5.0

MICHAEL S.

Cert. No. : ACL25337
Job No. : VC68AC0168
Pages : 5 of 8**4. Electrical signal tests of frequency weightings**

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	-0.1	0.0	±2.0
125	0.0	0.0	-0.1	±1.5
250	0.0	0.0	-0.1	±1.5
500	0.0	0.0	-0.1	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.0	0.0	±2.0
4000	0.0	0.0	0.0	±3.0
8000	0.0	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.2
C - weight	94.0	94.0	0.0	± 0.2
Flat	94.0	94.0	0.0	± 0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	94.0	0.0	± 0.1
Slow	94.0	94.0	0.0	± 0.1
Leq	94.0	94.0	0.0	± 0.1

6. Long - term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.3

MICHAEL S.

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7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	±1.1
136.0	136.0	0.0	±1.1
135.0	135.0	0.0	±1.1
134.0	134.0	0.0	±1.1
133.0	133.0	0.0	±1.1
132.0	132.0	0.0	±1.1
131.0	131.0	0.0	±1.1
129.0	129.0	0.0	±1.1
124.0	124.0	0.0	±1.1
119.0	119.0	0.0	±1.1
114.0	114.0	0.0	±1.1
109.0	109.0	0.0	±1.1
104.0	104.0	0.0	±1.1
99.0	99.0	0.0	±1.1
94.0	94.0	0.0	±1.1
89.0	89.0	0.0	±1.1
84.0	84.0	0.0	±1.1
79.0	79.0	0.0	±1.1
74.0	74.0	0.0	±1.1
69.0	69.0	0.0	±1.1
64.0	64.0	0.0	±1.1
59.0	59.0	0.0	±1.1
54.0	54.0	0.0	±1.1
49.0	49.0	0.0	±1.1
44.0	44.0	0.0	±1.1
39.0	39.0	0.0	±1.1
34.0	34.0	0.0	±1.1
30.0	30.0	0.0	±1.1
29.0	29.0	0.0	±1.1
28.0	28.0	0.0	±1.1
27.0	27.1	0.1	±1.1
26.0	26.0	0.0	±1.1
25.0	25.0	0.0	±1.1

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Job No. : VC68AC0168
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8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.1	0.1	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	28.9	-0.1	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.0 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
SEL	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

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10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L _{peak} (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	±3.0
One	133.4	133.3	-0.1	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle	0.0	±1.5
89.5	89.5		

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	137.0	137.0	0.0	±0.3

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor $k = 2$ or any value following calculation, providing a level of confidence of approximately 95 %

End of Calibration Certificate

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Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42A / Microphone UC-52 / Preampifier NH-24
Serial No.: 00623390 / 198637 / 26418
ID No.: RYG_FS0615

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location : -
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

Received Date : 12 DECEMBER 2024
Calibration Date : 23 - 24 DECEMBER 2024
Date of Issue : 26 DECEMBER 2024

Calibrated by : Nathakorn Pisutpaisan

Approved by :

T. Petchurai
(Thanakul Petchurai)

This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard, may not be reproduced other than in full, except with the prior written approval of the head of Calibration Laboratory.

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Cert. No. : ACL24421
Job No. : VC68AC0051
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL_BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL_BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL_BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KAI	34560495	AA-3001-24	05-FEB-25

2. This result of calibration was found accurate as shown on date and place of calibration for this calibrated item only.
3. This certificate is traceable to the international system of unit maintained at :
3.1 National Institute of Metrology (Thailand).
3.2 Thailand Institute of Scientific and Technological Research (TISTR).

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Cert. No. : ACL24421
Job No. : VC68AC0051
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Summary of Measurement Result :

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	0.3	1.0
5. Frequency and time weightings at 1 kHz	0.2	0.2
6. Long - term stability	0.1	0.1
7. Level linearity on the reference level range	0.2	0.3
8. Level linearity including the level range control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

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Job No. : VC68AC0051
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Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
14.6

2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency Weighting	Weighting (dB)
A - weight	13.1
C - weight	19.5
Flat	24.8

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 84 dB

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
125	0.5	0.5	0.5	± 1.5
1000	0.2	0.2	0.2	± 1.0
8000	0.0	0.0	0.0	±5.0

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Cert. No. : ACL24421
Job No. : VC68AC0051
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4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
63	-0.1	-0.1	-0.1	±2.0
125	0.0	0.0	-0.1	±1.5
250	0.0	0.0	-0.1	±1.5
500	0.0	0.0	-0.1	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.0	0.0	±2.0
4000	0.0	0.0	0.0	±3.0
8000	0.0	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.2
C - weight	94.0	94.0	0.0	± 0.2
Flat	94.0	94.0	0.0	± 0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	94.0	0.0	± 0.1
Slow	94.0	94.0	0.0	± 0.1
Leq	94.0	94.0	0.0	± 0.1

6. Long - term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.3

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Job No. : VC68AC0051
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7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	± 1.1
136.0	136.0	0.0	± 1.1
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	132.9	-0.1	± 1.1
132.0	131.9	-0.1	± 1.1
131.0	130.9	-0.1	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.0	0.0	± 1.1
114.0	114.0	0.0	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.0	0.0	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.0	0.0	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	39.0	0.0	± 1.1
34.0	34.0	0.0	± 1.1
30.0	30.0	0.0	± 1.1
29.0	29.0	0.0	± 1.1
28.0	27.9	-0.1	± 1.1
27.0	27.0	0.0	± 1.1
26.0	25.9	-0.1	± 1.1
25.0	24.9	-0.1	± 1.1

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Cert. No. : ACL24421
Job No. : VC68AC0051
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	29.0	0.0	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
SEL	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

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Cert. No. : ACL24421
Job No. : VC68AC0051
Pages : 8 of 8

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L _{peak} (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	±3.0
One	133.4	133.4	0.0	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle	Value (dB)	Value (dB)
89.6	89.6	0.0	±1.5

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	137.0	137.0	0.0	±0.3

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor $k = 2$
or any value following calculation, providing a level of confidence of approximately 95 %

End of Calibration Certificate

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Cert. No. : ACL24420
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42A / Microphone UC-52 / Preamplifier NH-24
Serial No.: 00623389 / 198636 / 26417
ID No.: RYG_FS0614

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWANG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location : -
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

Received Date : 12 DECEMBER 2024
Calibration Date : 23 - 24 DECEMBER 2024
Date of Issue : 26 DECEMBER 2024

Calibrated by :

Nathakorn Pisutpaisan

Approved by :

T. Petch
(Thanakul Petchurai)

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Cert. No. : ACL24420
Job No. : VC68AC0051
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL_BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL_BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL_BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KAI	34560495	AA-3001-24	05-FEB-25

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

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

- 3.1 National Institute of Metrology (Thailand).
- 3.2 Thailand Institute of Scientific and Technological Research (TISTR).

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Cert. No. : ACL24420
Job No. : VC68AC0051
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	0.3	1.0
5. Frequency and time weightings at 1 kHz	0.2	0.2
6. Long - term stability	0.1	0.1
7. Level linearity on the reference level range	0.2	0.3
8. Level linearity including the level range control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

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Cert. No. : ACL24420
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Page : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
13.8

2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency Weighting	Weighting (dB)
A - weight	9.9
C - weight	16.8
Flat	22.7

3. Acoustical signal tests of frequency weightings

Meter free field acoustic response at a level of 84 dB

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
125	0.3	0.4	0.4	±1.5
1000	0.2	0.2	0.2	±1.0
8000	0.4	0.5	0.5	±5.0

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Job No. : VC68AC0051
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	0.0	0.0	±2.0
125	0.0	0.0	0.0	±1.5
250	0.0	0.0	0.0	±1.5
500	0.0	0.1	0.0	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.1	0.0	±2.0
4000	0.0	0.0	0.0	±3.0
8000	0.0	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.2
C - weight	94.0	94.0	0.0	± 0.2
Flat	94.0	94.0	0.0	± 0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	94.0	0.0	± 0.1
Slow	94.0	94.0	0.0	± 0.1
Lcq	94.0	94.0	0.0	± 0.1

6. Long - term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.3

T. Petch

Cert. No. : ACL24420
Job No. : VC68AC0051
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	± 1.1
136.0	136.0	0.0	± 1.1
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	133.0	0.0	± 1.1
132.0	132.0	0.0	± 1.1
131.0	131.0	0.0	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.0	0.0	± 1.1
114.0	114.0	0.0	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.0	0.0	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.0	0.0	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	39.0	0.0	± 1.1
34.0	34.0	0.0	± 1.1
30.0	30.0	0.0	± 1.1
29.0	29.0	0.0	± 1.1
28.0	28.0	0.0	± 1.1
27.0	27.0	0.0	± 1.1
26.0	25.9	-0.1	± 1.1
25.0	25.0	0.0	± 1.1

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8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	28.8	-0.2	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.1	0.1	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
SEL	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

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10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L _{peak} (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	±3.0
One	133.4	133.4	0.0	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.1	0.1	±2.0
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.6	89.5	-0.1	±1.5

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	137.0	137.0	0.0	±0.3

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor $k = 2$
or any value following calculation, providing a level of confidence of approximately 95 %

End of Calibration Certificate

T. Petchur

Cert. No. : ACL25099
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No.: 00734225 / 179117 / 87524
ID No.: RYG_FS0030

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location : -
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

Received Date : 14 JANUARY 2025
Calibration Date : 27-29 JANUARY 2025
Date of Issue : 30 JANUARY 2025

Calibrated by : Nathakorn Pisutpaisan

Approved by : *T. Petchur*
(Thanakul Petchurai)

This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard, may not be reproduced other than in full, except with the prior written approval of the head of Calibration Laboratory.

Cert. No. : ACL25099
Job No. : VC68AC0064
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.

For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL_BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL_BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL_BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KAI	34560495	AA-3001-24	05-FEB-25

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

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

- 3.1 National Institute of Metrology (Thailand).
- 3.2 Thailand Institute of Scientific and Technological Research (TISTR).

T. Petch.

Cert. No. : ACL25099
Job No. : VC68AC0064
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	0.3	1.0
5. Frequency and time weightings at 1 kHz	0.2	0.2
6. Long - term stability	0.1	0.1
7. Level linearity on the reference level range	0.2	0.3
8. Level linearity including the level range control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

T. Petch.

Cert. No. : ACL25099
Job No. : VC68AC0064
Page : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
14.8

2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency Weighting	Weighting (dB)
A - weight	12.0
C - weight	18.2
Flat	23.8

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 84 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.3	0.3	0.3	± 1.5
1000	0.1	0.1	0.1	± 1.0
8000	1.1	2.2	2.2	±5.0

T. Petch.

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Job No. : VC68AC0064
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	-0.1	-0.1	0.0	±2.0
125	0.0	0.0	0.0	±1.5
250	0.0	0.0	0.0	±1.5
500	0.0	0.1	0.0	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.1	0.0	±2.0
4000	0.0	0.1	0.0	±3.0
8000	0.0	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.2
C - weight	94.0	94.0	0.0	± 0.2
Flat	94.0	94.0	0.0	± 0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	94.0	0.0	± 0.1
Slow	94.0	94.0	0.0	± 0.1
Leq	94.0	94.0	0.0	± 0.1

6. Long - term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.3

T. Petch.

Cert. No. : ACL25099
Job No. : VC68AC0064
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	± 1.1
136.0	136.0	0.0	± 1.1
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	133.0	0.0	± 1.1
132.0	132.0	0.0	± 1.1
131.0	131.0	0.0	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.0	0.0	± 1.1
114.0	114.0	0.0	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.0	0.0	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.0	0.0	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	39.0	0.0	± 1.1
34.0	34.0	0.0	± 1.1
30.0	29.9	-0.1	± 1.1
29.0	28.9	-0.1	± 1.1
28.0	27.9	-0.1	± 1.1
27.0	26.9	-0.1	± 1.1
26.0	25.8	-0.2	± 1.1
25.0	24.9	-0.1	± 1.1

T. Petch

Cert. No. : ACL25099
Job No. : VC68AC0064
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	28.8	-0.2	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.1	0.1	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	±1.0
	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
SEL	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.1	0.1	±1.0

T. Petch

Cert. No. : ACL25099
Job No. : VC68AC0064
Pages : 8 of 8

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L _{peak} (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	±3.0
One	133.4	133.3	-0.1	±3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	±2.0
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle	-0.1	±1.5
89.6	89.5		

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	137.0	137.0	0.0	±0.3

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor $k = 2$ or any value following calculation, providing a level of confidence of approximately 95 %

End of Calibration Certificate

T. Petch

Cert. No. : ACL25103
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No. : 00296516 / 180412 / 88182
ID No. : RYG_FS0433

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location : -
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

Received Date : 14 JANUARY 2025
Calibration Date : 27-29 JANUARY 2025
Date of Issue : 30 JANUARY 2025

Calibrated by :

Nathakorn Pisutpaisan

Approved by :

T. Petch
(Thanakul Petchurai)

This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard, may not be reproduced other than in full, except with the prior written approval of the head of Calibration Laboratory.

Cert. No. : ACL25103
Job No. : VC68AC0064
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.

For tests results of each items were made by observation of each Instruments display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL-BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL-BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL-BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KAI	34560495	AA-3001-24	05-FEB-25

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

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

3.1 National Institute of Metrology (Thailand).

3.2 Thailand Institute of Scientific and Technological Research (TISTR).

P. Petch.

Cert. No. : ACL25103
Job No. : VC68AC0064
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	0.2	N/A
2. Self-generated noise	0.2	N/A
3. Acoustical signal tests of frequency weightings		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	0.3	1.0
5. Frequency and time weightings at 1 kHz	0.2	0.2
6. Long - term stability	0.1	0.1
7. Level linearity on the reference level range	0.2	0.3
8. Level linearity including the level range control	0.2	0.3
9. Tone burst response	0.2	0.3
10. Peak C sound level	0.2	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

P. Petch.

Cert. No. : ACL25103
Job No. : VC68AC0064
Page : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.94)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
14.2

2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency Weighting	Weighting (dB)
A - weight	10.8
C - weight	17.3
Flat	22.9

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 84 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.3	0.3	0.3	± 1.5
1000	0.0	0.0	0.0	± 1.0
8000	1.0	1.0	1.0	±5.0

P. Petch.

Cert. No. : ACL25103
Job No. : VC68AC0064
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	-0.1	0.0	±2.0
125	0.0	0.0	0.0	±1.5
250	0.0	0.0	-0.1	±1.5
500	0.0	0.0	-0.1	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.0	0.0	±2.0
4000	0.0	0.0	0.0	±3.0
8000	0.0	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.2
C - weight	94.0	94.0	0.0	± 0.2
Flat	94.0	94.0	0.0	± 0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	94.0	0.0	± 0.1
Slow	94.0	94.0	0.0	± 0.1
Leq	94.0	94.0	0.0	± 0.1

6. Long - term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	94.0	0.0	± 0.3

P. Petch.

Cert. No. : ACL25103
Job No. : VC68AC0064
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	± 1.1
136.0	136.0	0.0	± 1.1
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	132.9	-0.1	± 1.1
132.0	131.9	-0.1	± 1.1
131.0	130.9	-0.1	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.0	0.0	± 1.1
114.0	114.0	0.0	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.0	0.0	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.0	0.0	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	39.0	0.0	± 1.1
34.0	34.0	0.0	± 1.1
30.0	29.9	-0.1	± 1.1
29.0	28.9	-0.1	± 1.1
28.0	27.9	-0.1	± 1.1
27.0	26.9	-0.1	± 1.1
26.0	25.9	-0.1	± 1.1
25.0	24.8	-0.2	± 1.1

P. Petch

Cert. No. : ACL25103
Job No. : VC68AC0064
Pages : 7 of 8

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	94.0	94.0	0.0	± 1.1

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
130	29.0	28.9	-0.1	± 1.1

9. Tone burst response

Time Weighting	Tone burst duration, Tb (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.0	0.0	± 1.0
Slow	2	8	108.0	108.0	0.0	1.5 ; -5.0
	200	800	127.6	127.6	0.0	± 1.0
	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
SEL	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	± 1.0

P. Petch

Cert. No. : ACL25103
Job No. : VC68AC0064
Pages : 8 of 8

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Lepeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	130.0	130.0	0.0	± 3.0
One	133.4	133.4	0.0	± 3.0

Number of cycle in test signal	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	± 2.0
Positive half cycle	135.4	135.1	-0.3	± 2.0
Negative half cycle	135.4	135.2	-0.2	± 2.0

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle	Value (dB)	Limits (dB)
89.5	89.5	0.0	± 1.5

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A-weight	137.0	137.0	0.0	± 0.3

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor $k = 2$ or any value following calculation, providing a level of confidence of approximately 95 %

End of Calibration Certificate

P. Petch

Sithiporn Associates CO., Ltd.
63/14-15, 32/35-36,
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NSC-TIS-TIS 17025
CALIBRATION 0367
Temperature measurement laboratory
Calibration services department.

CERTIFICATE OF CALIBRATION

Certificate No. : CDT-220-67

Page 1 of 2 Pages

MEASUREMENT ITEM : Heat Stress Monitor
MANUFACTURER : Delta OHM
MODEL/TYPE : HD32.2
SERIAL NUMBER : 15020734
ID NUMBER : RYG_F50230
CONDITION AS-RECEIVED : Used item
CUSTOMER : ALS laboratory group (thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd.,
Khwaeng Suan Luang, Khet Suan Luang,
Bangkok 10250 Thailand.

RECEIVED DATE : 11 Dec 2024
MEASUREMENT DATE : 23 Dec 2024
ISSUE DATE : 23 Dec 2024

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:
Temperature : 23.0 ± 3.0 °C
Relative Humidity : 55.0 ± 15.0 %RH

NOTED: The certificate is valid only to the item calibrated on date and place of calibration.

TABULATION OF RESULTS:

The table on next page give the measured values.

Calibration procedure:
The temperature calibration will done by
to-Fluke calibration method as (NIST-901)
according to conformance method with standard
digital temperature indicator and standard
temperature probe. The temperature scale use
was based on ITS-90.

Traceability:
The reported uncertainty of measurement is
based on the standard uncertainty multiplied by
a coverage factor $k=2$, which for a normal
distribution corresponds to a coverage
probability of approximately 95%. The standard
uncertainty has been determined in accordance
with the GUM Evaluation of measurement data
Guide to the expression of uncertainty in
measurement.

Reference Used During Calibration:
1. Standard Temperature Probe
Model: STS-100 AS50, Serial No: 667682-09,
Due date: 26 Mar 2025
2. Digital Temperature Indicator
Model: DTI-1000 A MR II, Serial No: 621807-
00591 Due date: 21 Oct 2025

Uncertainty of Measurement:
The reported uncertainty of measurement is
based on the standard uncertainty multiplied by
a coverage factor $k=2$, which for a normal
distribution corresponds to a coverage
probability of approximately 95%. The standard
uncertainty has been determined in accordance
with the GUM Evaluation of measurement data
Guide to the expression of uncertainty in
measurement.

REVIEW BY: S.T.S.

APPROVED BY: P. Petch

NEXT CAL DATE: 23/12/25

Calibrated by:
Mr. Sittichai Thachalad
Mr. Sittichai Thachalad
Mr. Sittichai ThachaladJ
NAC
JIRANATEE ASSOCIATES CO., LTD.Approved signatory: Mr. Pinyan Booncharoen
Calibration Department Manager

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range: 20 °C to 40 °C

Function:

Table 1: This equipment was connected with wet bulb probe Model: HP3201.2, S/N: 17015112.
Dimension: Diameter 3.3 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.067	20.0	-0.1	0.099
80	25.060	25.0	-0.1	0.099
80	30.054	29.9	-0.2	0.099
80	35.044	34.9	-0.1	0.099
80	40.034	40.0	0.0	0.099

Table 2: This equipment was connected with Globe thermometer probe Model: TP3207.2, S/N: 15028482.
Dimension: Diameter 3.3 mm. Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.066	20.1	0.0	0.099
110	25.061	25.1	0.0	0.099
110	30.054	30.0	0.0	0.16
110	35.043	35.0	0.0	0.099
110	40.034	40.0	0.0	0.099

Table 3: This equipment was connected with temperature probe Model: TP3207.2, S/N: 15033222.
Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.067	20.1	0.0	0.099
75	25.061	25.0	-0.1	0.099
75	30.055	29.9	-0.2	0.099
75	35.044	34.8	-0.2	0.099
75	40.034	39.7	-0.3	0.099

UUC: Unit Under Calibration
Remark: The reported uncertainty of measurement is 0.16, based on standard uncertainty multiplied by a coverage factor k=2.21 providing a level of confidence of approximately 95%.

End of Certificate of Calibration



CERTIFICATE OF CALIBRATION

Certificate No. : CDT-221-67

Page 1 of 2 Pages

MEASUREMENT ITEM : Heat Stress Monitor
MANUFACTURER : Delta OHM
MODEL/TYPE : HD32.2
SERIAL NUMBER : 15020735
ID NUMBER : RYG_F50231
CONDITION AS-RECEIVED : Used item
CUSTOMER : ALS laboratory group (thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd.,
Khwaeng Suan Luang, Khet Suan Luang,
Bangkok 10250 Thailand.

RECEIVED DATE : 11 Dec 2024
MEASUREMENT DATE : 23 Dec 2024
ISSUE DATE : 23 Dec 2024

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:
Temperature : 23.0 ± 3.0 °C
Relative Humidity : 55.0 ± 15.0 %RH

NOTED: The certificate is valid only to the item calibrated on date and place of calibration.

TABULATION OF RESULTS:

The table on next page give the measured values.

REVIEW BY: S/S
APPROVED BY: [Signature]
NEXT CAL DATE: 23/12/25



Approved signatory: [Signature]
Mr. Panyapa Booncharoen
Calibration Department Manager

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range: 20 °C to 40 °C

Function:

Table 1: This equipment was connected with wet bulb probe Model: HP3201.2, S/N: 15035050.
Dimension: Diameter 3.3 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.064	20.1	0.0	0.099
80	25.063	25.1	0.0	0.099
80	30.047	30.1	0.1	0.099
80	35.037	35.0	0.0	0.099
80	40.024	40.0	0.0	0.099

Table 2: This equipment was connected with Globe thermometer probe Model: TP3207.2, S/N: 17023218.
Dimension: Diameter 3.3 mm. Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.064	20.1	0.0	0.099
110	25.063	25.1	0.0	0.099
110	30.047	30.1	0.1	0.099
110	35.037	35.1	0.1	0.099
110	40.024	40.1	0.1	0.099

Table 3: This equipment was connected with temperature probe Model: TP3207.2, S/N: 15033221.
Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.064	20.1	0.0	0.099
75	25.063	25.0	-0.1	0.099
75	30.047	30.0	0.0	0.099
75	35.037	35.0	0.0	0.099
75	40.024	40.0	0.0	0.099

UUC: Unit Under Calibration

End of Certificate of Calibration



CERTIFICATE OF CALIBRATION

Certificate No. : CDT-034-68

Page 1 of 2 Pages

MEASUREMENT ITEM : Heat Stress Monitor
MANUFACTURER : Delta OHM
MODEL/TYPE : HD32.2
SERIAL NUMBER : 15006720
ID NUMBER : RYG_F50224
CONDITION AS-RECEIVED : Used item
CUSTOMER : ALS laboratory group (thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd.,
Khwaeng Suan Luang, Khet Suan Luang,
Bangkok 10250 Thailand.

RECEIVED DATE : 17 Jan 2025
MEASUREMENT DATE : 27 Jan 2025
ISSUE DATE : 29 Jan 2025

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:
Temperature : 23.0 ± 3.0 °C
Relative Humidity : 55.0 ± 15.0 %RH

NOTED: The certificate is valid only to the item calibrated on date and place of calibration.

TABULATION OF RESULTS:

The table on next page give the measured values.

REVIEW BY: S/S
APPROVED BY: [Signature]
NEXT CAL DATE: 26/01/2026



Approved signatory: [Signature]
Mr. Panyapa Booncharoen
Calibration Department Manager

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range: 20 °C to 40 °C

Function:

Table 1: This equipment was connected with wet bulb probe Model: HP3201.2, S/N: 15015854.
Dimension: Diameter 3.3 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.067	19.7	-0.4	0.099
80	25.060	24.7	-0.4	0.099
80	30.051	29.7	-0.4	0.099
80	35.041	34.7	-0.3	0.099
80	40.028	39.6	-0.4	0.099

Table 2: This equipment was connected with Globe thermometer probe Model: TP3276.2, S/N: 20008279.
Dimension: Diameter 3.3 mm. Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.068	20.1	0.0	0.099
110	25.060	25.1	0.0	0.099
110	30.051	30.1	0.0	0.099
110	35.040	35.1	0.1	0.099
110	40.028	40.2	0.1	0.16

Table 3: This equipment was connected with temperature probe Model: TP3207.2, S/N: 15015498.
Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.068	20.3	0.2	0.099
75	25.060	25.2	0.1	0.099
75	30.051	30.1	0.0	0.099
75	35.040	35.1	0.1	0.099
75	40.028	40.0	0.0	0.099

UUC*: Unit Under Calibration

Remark: The reported uncertainty of measurement is 0.16, based on standard uncertainty multiplied by a coverage factor k=2.21 providing a level of confidence of approximately 95%.

End of Certificate of Calibration



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NSC-TIS-TIS 17025
CALIBRATION 0367

Temperature measurement laboratory
Calibration services department.

CERTIFICATE OF CALIBRATION

Certificate No. : CDT-005-68

Page 1 of 2 Pages

MEASUREMENT ITEM
MANUFACTURER
MODEL/TYPE
SERIAL NUMBER
ID NUMBER
CONDITION AS-RECEIVED
CUSTOMER

: Heat Stress Monitor
: Delta OHM
: HD32.2
: 15006718
: RYG_F50223
: Used item
: ALS laboratory group (thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd.,
Khwaeng Suan Luang, Khet Suan Luang,
Bangkok 10250 Thailand.

RECEIVED DATE
MEASUREMENT DATE
ISSUE DATE

: 27 Dec 2024
: 07 Jan 2025
: 08 Jan 2025

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:
Temperature : 23.0 ± 3.0 °C
Relative Humidity : 55.0 ± 15.0 %RH

NOTED: The certificate is valid only to the item calibrated on date and place of calibration.

TABULATION OF RESULTS:

The table on next page give the measured values.

REVIEW BY: S.T.S.
APPROVED BY: [Signature]
NEXT CAL DATE: 07/01/26



Approved signatory: [Signature]
Mr. Parinya Booncharoen
Calibration Department Manager.

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range: 20 °C to 40 °C

Function:

Table 1: This equipment was connected with wet bulb probe Model: HP3201.2, S/N: 18009588.
Dimension: Diameter 3.3 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.068	20.1	0.0	0.099
80	25.061	25.1	0.0	0.099
80	30.053	30.1	0.0	0.099
80	35.043	35.1	0.1	0.099
80	40.035	40.0	0.0	0.099

Table 2: This equipment was connected with Globe thermometer probe Model: TP3276.2, S/N: 20019638.
Dimension: Diameter 3.3 mm. Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.068	20.2	0.1	0.099
110	25.061	25.2	0.1	0.099
110	30.053	30.2	0.1	0.099
110	35.043	35.2	0.2	0.099
110	40.035	40.2	0.2	0.099

Table 3: This equipment was connected with temperature probe Model: TP3207.2, S/N: 15015496.
Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.068	20.3	0.2	0.099
75	25.061	25.2	0.1	0.099
75	30.053	30.1	0.0	0.099
75	35.043	35.0	0.0	0.099
75	40.035	39.9	-0.1	0.099

UUC*: Unit Under Calibration

End of Certificate of Calibration



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NSC-TIS-TIS 17025
CALIBRATION 0367

Temperature measurement laboratory
Calibration services department.

CERTIFICATE OF CALIBRATION

Certificate No. : CDT-218-67

Page 1 of 2 Pages

MEASUREMENT ITEM
MANUFACTURER
MODEL/TYPE
SERIAL NUMBER
ID NUMBER
CONDITION AS-RECEIVED
CUSTOMER

: Heat Stress Monitor
: Delta OHM
: HD32.2
: 15006716
: RYG_F50221
: Used item
: ALS laboratory group (thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd.,
Khwaeng Suan Luang, Khet Suan Luang,
Bangkok 10250 Thailand.

RECEIVED DATE
MEASUREMENT DATE
ISSUE DATE

: 11 Dec 2024
: 20 Dec 2024
: 23 Dec 2024

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:
Temperature : 23.0 ± 3.0 °C
Relative Humidity : 55.0 ± 15.0 %RH

NOTED: The certificate is valid only to the item calibrated on date and place of calibration.

TABULATION OF RESULTS:

The table on next page give the measured values.

REVIEW BY: S.T.S.
APPROVED BY: [Signature]
NEXT CAL DATE: 20/12/25



Approved signatory: [Signature]
Mr. Parinya Booncharoen
Calibration Department Manager.

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range: 20 °C to 40 °C

Function:

Table 1: This equipment was connected with wet bulb probe Model: HP3201.2, S/N: 18009587.
Dimension: Diameter 3.3 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.066	20.1	0.0	0.099
80	25.061	25.1	0.0	0.099
80	30.053	30.1	0.0	0.099
80	35.045	35.0	0.0	0.099
80	40.034	40.0	0.0	0.099

Table 2: This equipment was connected with Globe thermometer probe Model: TP3276.2, S/N: 15015067.
Dimension: Diameter 3.3 mm. Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.066	20.0	-0.1	0.099
110	25.061	25.0	-0.1	0.099
110	30.052	30.1	0.0	0.099
110	35.045	35.0	0.0	0.099
110	40.034	40.0	0.0	0.099

Table 3: This equipment was connected with temperature probe Model: TP3207.2, S/N: 15015492.
Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.066	20.3	0.2	0.099
75	25.061	25.2	0.1	0.099
75	30.053	30.1	0.0	0.099
75	35.045	34.9	-0.1	0.099
75	40.034	39.9	-0.1	0.099

UUC*: Unc Under Calibration

End of Certificate of Calibration



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NSC-TISI-TIS 17025
CALIBRATION 0367

Temperature measurement laboratory
Calibration services department.

CERTIFICATE OF CALIBRATION

Certificate No. : CDT-035-68

Page 1 of 2 Pages

MEASUREMENT ITEM : Heat Stress Monitor
MANUFACTURER : Delta OHM
MODEL/TYPE : HD32.2
SERIAL NUMBER : 15006726
ID NUMBER : RYG_F50226
CONDITION AS-RECEIVED : Used item
CUSTOMER : ALS laboratory group (thailand) Co., Ltd.
104 Phattananan 40, Phattananan Rd.,
Khwaeng Suan Luang, Khet Suan Luang,
Bangkok 10250 Thailand.

RECEIVED DATE : 17 Jan 2025
MEASUREMENT DATE : 27 Jan 2025
ISSUE DATE : 29 Jan 2025

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:
Temperature : 23.0 ± 3.0 °C
Relative Humidity : 55.0 ± 15.0 %RH

NOTED: The certificate is valid only to the item calibrated on date and place of calibration.

TABULATION OF RESULTS:

The table on next page give the measured values.

REVIEW BY : S.T.S.
APPROVED BY : [Signature]
NEXT CAL DATE : 26/01/2026



Approved signatory: Mr. Pannipa Boonchaisri
Calibration Department Manager

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range: 20 °C to 40 °C

Function:

Table 1: This equipment was connected with wet bulb probe Model: HP3201.2, S/N: 15015843.
Dimension: Diameter 3.3 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.067	20.1	0.0	0.16
80	25.060	25.0	-0.1	0.099
80	30.050	30.0	-0.1	0.099
80	35.041	35.0	0.0	0.099
80	40.028	40.0	0.0	0.099

Table 2: This equipment was connected with Globe thermometer probe Model: TP3276.2, S/N: 20008282.
Dimension: Diameter 3.3 mm. Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.067	20.1	0.0	0.099
110	25.060	25.1	0.0	0.099
110	30.051	30.1	0.0	0.16
110	35.041	35.1	0.1	0.099
110	40.028	40.0	0.0	0.099

Table 3: This equipment was connected with temperature probe Model: TP3207.2, S/N: 15015496.
Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.067	20.2	0.1	0.099
75	25.060	25.0	-0.1	0.099
75	30.051	29.9	-0.2	0.099
75	35.041	34.9	-0.1	0.099
75	40.028	39.8	-0.2	0.099

UUC*: Unc Under Calibration

Remark: The reported uncertainty of measurement is 0.16, based on standard uncertainty multiplied by a coverage factor k=2.21 providing a level of confidence of approximately 95%.

End of Certificate of Calibration



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42/14-15, 6/20-80
Wichitwong 17/1, 40, Wattana, Bangkok 10110
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Accredited calibration laboratory
ISO/IEC 17025:2017
NSC-TISI-TIS 17025
CALIBRATION 0367

Temperature measurement laboratory
Calibration services department.

CERTIFICATE OF CALIBRATION

Certificate No. : CDT-009-68

Page 1 of 2 Pages

MEASUREMENT ITEM : Heat Stress Monitor
MANUFACTURER : Delta OHM
MODEL/TYPE : HD32.2
SERIAL NUMBER : 18018314
ID NUMBER : RYG_F50359
CONDITION AS-RECEIVED : Used item
CUSTOMER : ALS laboratory group (thailand) Co., Ltd.
104 Phattananan 40, Phattananan Rd.,
Khwaeng Suan Luang, Khet Suan Luang,
Bangkok 10250 Thailand.

RECEIVED DATE : 27 Dec 2024
MEASUREMENT DATE : 08 Jan 2025
ISSUE DATE : 08 Jan 2025

ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:
Temperature : 23.0 ± 3.0 °C
Relative Humidity : 55.0 ± 15.0 %RH

NOTED: The certificate is valid only to the item calibrated on date and place of calibration.

TABULATION OF RESULTS:

The table on next page give the measured values.

REVIEW BY : S.T.S.
APPROVED BY : [Signature]
NEXT CAL DATE : 08/01/26



Approved signatory: Mr. Pannipa Boonchaisri
Calibration Department Manager

THIS CERTIFICATE OF CALIBRATION MAY NOT BE REPRODUCED EXCEPT IN FULL UNLESS PERMISSION FOR REPRODUCTION HAS BEEN OBTAINED IN WRITING FROM THE LABORATORY

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range: 20 °C to 40 °C

Function:

Table 1: This equipment was connected with wet bulb probe Model: HP3201.2, S/N: 18021465.
Dimension: Diameter 3.3 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.052	20.0	-0.1	0.099
80	25.058	25.0	-0.1	0.099
80	30.056	30.1	0.0	0.099
80	35.045	34.9	-0.1	0.16
80	40.037	39.9	-0.1	0.099

Table 2: This equipment was connected with Globe thermometer probe Model: TP3276.2, S/N: 20008280.
Dimension: Diameter 3.3 mm. Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.052	20.0	-0.1	0.099
110	25.058	25.1	0.0	0.16
110	30.056	30.1	0.0	0.099
110	35.044	35.1	0.1	0.099
110	40.037	40.1	0.1	0.099

Table 3: This equipment was connected with temperature probe Model: TP3207.2, S/N: 18021262.
Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.052	20.1	0.0	0.099
75	25.058	25.0	-0.1	0.099
75	30.056	29.9	-0.2	0.099
75	35.044	34.8	-0.2	0.099
75	40.037	39.7	-0.3	0.099

UUC*: Unit Under Calibration

Remark: The reported uncertainty of measurement is 0.16, based on standard uncertainty multiplied by a coverage factor $k=2$, 71, providing a level of confidence of approximately 95%.

End of Certificate of Calibration



Certificate of Calibration

Certificate No.: 25PH134
Page: 1 of 2

Equipment: Lux Meter
Manufacturer: TENMARS
Model: TM-201L
Serial No.: 200300974
ID No.: RYG_FS0474

Condition As-Received: Used Item
Received Date: 05 March 2025
Calibration Date: 13 March 2025

Reference: 2503-0138WSC
Ambient Temperature: (23 ± 2) °C
Relative Humidity: (50 ± 15) %

Submitted by: ALS Laboratory Group (Thailand) Co., Ltd.

104 Phatthanakan 40, Phatthanakan Rd.,
Khwaeng Phatthanakan, Khet Suan Luang,
Bangkok 10250 Thailand

Procedure used: Calibration were conducted using calibration procedure No. CP-PH01 based on inverse square law technique.

Condition of this result of calibration

1. Reference standards instruments:

Instrument	Model	Serial No.	Certificate No.	Due Date
1) Photometry & Encoder	LMguide 9,6 m	120RC003	DL-0064-22	20 Jul 2025
2) STANDARD LAMP	OL FEL-U	F-1785	TP-1009-24	17 May 2025

2. This result of calibration was made on requested at the point specified by customer.

3. Test Equipment: Programmable Voltage/Current Source (Model: OL83A, S/N: 16221394).

4. Test Equipment: Illuminance Meter (Model: 51002, S/N: 080129).

5. The certificate is valid only to the item calibrated on date and place of calibration.

6. This Certification is traceable to the International System of Unit maintained through:-

-National Institute of Metrology Thailand (NIMT)

-National Institute of Metrology (Thailand), NSC-ONSC Accredited No. Calibration 0144

REVIEW BY: *S.T.S*
APPROVED BY: *S.T.S*
NEXT CAL DATE: 12/03/2026

Calibrated by: Nivat Nitak
Issue Date: 14 March 2025

Approved Signatory: *Nivat Nitak*
[] Phalinee Prabpaipal
[] Chatchawan Khunpluek
[✓] Nuntawat Khamchai



Cert. No.: 25PH134
Page: 2 of 2

Result of calibration: (*) Without adjustment () After adjustment

Function: Illuminance Measurement Range: 200 lx

Standard Value	UUC* Reading	Error	Uncertainty
(lx)	(lx)	(lx)	(± lx)
0	0.5	0.5	+
20	19.8	-0.2	0.26
50	50.0	0.0	0.65
100	100.4	0.4	1.3
150	150.6	0.6	2.0
190	190.7	0.7	2.5

Function: Illuminance Measurement Range: 2000 lx

Standard Value	UUC* Reading	Error	Uncertainty
(lx)	(lx)	(lx)	(± lx)
200	199	-1	2.6
500	499	-1	6.5
1000	1000	0	13
1500	1501	1	20
1900	1903	3	25

Function: Illuminance Measurement Range: 20000 lx

Standard Value	UUC* Reading	Error	Uncertainty
(lx)	(lx)	(lx)	(± lx)
2000	1990	-10	26
3000	3000	0	39
4000	4010	10	52
5000	5030	30	65

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

UUC* = Unit Under Calibration.

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CERTIFICATE OF CALIBRATION

FOR

NOMENCLATURE: DIGITAL LED METER
MANUFACTURER: PEAKMETER
MODEL / TYPE: PM6612L
SERIAL NO.: H12A-D16371 [RYG_FS0538]
CLID. NO.: 252502063
JOB CONTROL NO.: 250815094917
CALIBRATION SERVICE: ☒ IN-LABORATORY ☐ ON-SITE

REVIEW BY: *S.T.S*
APPROVED BY: *S.T.S*
NEXT CAL DATE: 17/08/2026

CUSTOMER: ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN RD.,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG, BANGKOK 10250, THAILAND

DATE OF RECEIVED: 15 August 2025 DATE OF ISSUED: 20 August 2025

The report of calibration shall not be reproduced except in full without approval of the Calibration Laboratory Co., Ltd.

Calibrated By: Suwit Phuanbusabong
Calibration Engineer



Approved By: Mongkol Yotsoontorn
Authorized Signatory
20 August 2025

This Calibration Certificate documents the traceability to national standards, which realize the units of measurement according to the International System of Units (SI)

Certificate No. Q25094917

F3-011-05/12-23

page 1 of 3





REPORT OF CALIBRATION

FOR

NOMENCLATURE : DIGITAL LED METER
MANUFACTURER : PEAKMETER
MODEL / TYPE : PM6612L
SERIAL NO. : H12A-D16371 [RYG_FS0538]
DATE OF CALIBRATION : 18 August 2025

ENVIRONMENT CONDITIONS :

Temperature : $(23 \pm 2) ^\circ\text{C}$ Relative Humidity : $(55 \pm 15) \% \text{RH}$

PROCEDURE USED :

This instrument was calibrated under procedure No. CLC-CPEE-18 by comparison with Photometer/Radiometer & Illuminance Sensor which maintained by the Calibration Laboratory Co., Ltd.

REFERENCE STANDARD USED :

Photometer/Radiometer & Illuminance Sensor, Bentham Model ORM400/DH400VL S/N. 27710/1/27585/3.

TRACEABILITY :

The measurements are traceable to International System of Units (SI), through Optical Test and Calibration Ltd.
Certificate No. 158628/ABU, Due Date 01 May 2027.

UNCERTAINTY :

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k = 2.00$ which for a normal distribution corresponds to a coverage probability of approximately 95 %.
It has been evaluated according to the "Evaluation of the Uncertainty of Measurement in Calibration (EA-4/02 M:2022)"

Certificate No. Q25094917

F3-011-05/12-23

page 2 of 3



@clcalibration



CONDITION OF CALIBRATION ITEM : RECEIVED IN GOOD OPERATIONAL CONDITION

MEASUREMENT RESULTS : (X) without adjustment () adjustment

CALIBRATION DATA

DIGITAL LED METER RESULT

STD Applied (lux)	DUC Reading (lux)	Correction (lux)	Uncertainty \pm (% of rdg.)
0.00	0.00	0.00	-
15.00	14.12	+0.88	3.2
50.0	46.1	+3.9	2.6
100.0	92.8	+7.2	2.6
500	457	+43	2.6
1000	928	+72	2.6
2000	1887	+113	3.8
3000	2710	+290	3.8
4000	3640	+360	3.8
5000	4580	+420	3.8

Note. The Scope of Accredited ANAB Certificate No. ACDM-2814 Version 015 Page 56 of 68

This report is valid for the above stated instrument/s only.

End of Certificate

Certificate No. Q25094917

F3-011-05/12-23

page 3 of 3



@clcalibration



Certificate of Calibration

Cert.No.: 25CH393
Page.: 1 of 3

Equipment : pH Meter
Manufacturer : Mettler Toledo
Model : Seven2GoTM pH/mV S2
Serial No. : C202355606
ID No. : RYG_FS0574
Condition As-Received: Used Item
Received Date : 31 March 2025
Calibration Date : 01 April 2025
Reference : 2503-0981DSC-2
Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd. Rayong Branch
616/10 Moo 5, T.Maenam Khu, A.Pluakdaeng,
Rayong 21140, Thailand

Ambient Temperature : $(25 \pm 2.5) ^\circ\text{C}$
Relative Humidity : $(50 \pm 15) \%$
Calibration Procedure : In - house method :
- CP-CH5 by direct measurement with DC voltage standard and direct measurement with certified reference material (CRM)
- CP-CH8 by comparison with temperature standard

Calibrated by : Walalak Sirithan

Approved by :
Approved Signatory

() Chakrit Waewwanjua
() Ponpan Paipim
(✓) Sathip Meangmai

Issue Date : 2 April 2025

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full, except with the prior written Approval of the Head of Corporate Services 3: Equipment Calibration and Testing Services.



Cert.No.: 25CH393
Page.: 2 of 3

Condition of this calibration result

1. Reference Standard Instrument

Instrument	Serial No.	ID No.	Cert. No.	Due Date
1) Document Process Calibrator	54030049	130RC116	24E2759	25 Aug 2025
2) Ref. Standard Thermometer	4982054	110RC044	24I757	14 July 2025

- This Certification is traceable to SI Through Technology Promotion Association (Thailand - Japan)

2. Certified Reference Materials

:The measurement results are traceable to SI through Hach Lenge GmbH Ltd., Deutsche Akkreditierungsstelle, Accredited No.D-RM-15184-01-00
:The measurement results are traceable to SI through CPA chem Ltd., ANSI-ASQ National Accreditation Board, Accredited No. AR-1835

Buffer Solution	Manufacturer	Lot No.	Exp. date
pH 4.007	CPA chem	1066665	18 Jan 2027
pH 6.999	Hach Lenge GmbH	C03220	29 Oct 2026
pH 10.010	CPA chem	1066669	18 Jan 2026

3. This certificate is valid only to the item calibrated on date and place of calibration.

Calibration Results

Function : mV Measurement

Performing standard curve by Document Process Calibrator at pH (4,7,10)

Unit Under Calibration	Nominal Value	Standard Voltage Input	Actual Reading		Uncertainty of Measurement ($\pm \text{mV}$)	Coverage factor k
	pH	mV	mV	pH		
pH Meter S/N.: C202355606	4.00	177.48	177	4.00	0.58	2.00
	7.00	0.00	0	7.00	0.58	2.00
	10.00	-177.48	-178	10.00	0.58	2.00



Cert.No.: 25CH393
Page.: 3 of 3

Calibration Results

Function : pH Measurement

Performing three buffers standard curve by using buffer nominal pH (4,7,10)

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reading	Actual mV Reading (mV)	Uncertainty of pH Measurement (±)	Coverage factor k
pH Electrode S/N.: 2015870	4.007 6.999 10.010	4.01 7.01 10.02	175 1 -164	0.0085 0.0095 0.0096	2.05 2.00 2.00

Function : Temperature Measurement

(*) Without adjustment

This equipment was connected with Temperature Probe;

- Model : InLabExpert Go-ISM

- Serial No. : 2015870

Dimension of probe

- Length : 120 mm.

- Diameter : 12 mm.

- Immersion Depth : 100 mm.

Calibration Point (°C)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty of measurement (± °C)	Coverage factor k
25.0 45.0	25.002 45.000	25.0 45.1	-0.002 0.100	0.13 0.13	2.00 2.00

Remark : - UUC* = Unit Under Calibration

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

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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL.0-2717-3000-29 FAX.0-2719-9484



Certificate of Calibration

Cert.No.: 25CH709/1
Page.: 1 of 3

This Certificate was issued to re place to the Certificate No.25CH709

Equipment : pH Meter
Manufacturer : Mettler Toledo
Model : SevenExcellence
Serial No. : B834291445
ID No. : RYG_EN0152
Condition As-Received: Used Item
Received Date : 12 June 2025
Calibration Date : 18 June 2025
Reference : 2506-0407DSC-2
Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd.
Rayong Branch
616/10 Moo 5, T.Maenam Khu,
A.Pluakdaeng, Rayong 21140, Thailand

Ambient Temperature : (25 ± 2.5) °C
Relative Humidity : (50 ± 15) %
Calibration Procedure : In - house method :
- CP-CH5 by direct measurement with DC voltage standard and direct measurement with certified reference material (CRM)
- CP-CH8 by comparison with temperature standard

Calibrated by : Walalak Sirithean

Approved by :
Approved Signatory

() Chakrit Waewwanjua
() Ponpan Paipim
(✓) Saithip Meangmai

Issue Date : 1 July 2025

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full, except with the prior written Approval of the head of Corporate Services 3 : Equipment Calibration and Testing Services.



Cert.No.: 25CH709/1
Page.: 2 of 3

Condition of this calibration result

1. Reference Standard Instrument

Instrument	Serial No.	ID No.	Cert. No.	Due Date
1) Document Process Calibrator	54030049	130RC116	24E2759	25 Aug 2025
2) Ref. Standard Thermometer	4982054	110RC044	24I757	14 July 2025

- This measurement result is traceable to SI through Technology Promotion Association (Thailand - Japan)

2. Certified Reference Materials :The measurement results are traceable to SI through Hach Lenge GmbH Ltd., Deutsche Akkreditierungsstelle, Accredited No.D-RM-15184-01-00
:The measurement results are traceable to SI through CPA chem Ltd., ANSI-ASQ National Accreditation Board, Accredited No. AR-1835

Buffer Solution	Manufacturer	Lot No.	Exp. date
pH 4.007	CPA chem	1066665	18 Jan 2027
pH 7.000	Hach Lenge GmbH	C03232	02 Dec 2026
pH 10.010	CPA chem	1066669	18 Jan 2026

3. This certificate is valid only to the item calibrated on date and place of calibration.

Calibration Results

Function : mV Measurement

Performing standard curve by Document Process Calibrator at pH (4,7,10)

Unit Under Calibration	Nominal Value	Standard Voltage Input	Actual Reading		Uncertainty of Measurement (±mV)	Coverage factor k
	pH	mV	mV	pH		
pH Meter S/N.: B834291445	4.000 7.000 10.000	177.48 0.00 -177.48	177.3 -0.1 -177.5	4.000 7.000 10.000	0.058 0.058 0.058	2.00 2.00 2.00



Cert.No.: 25CH709/1
Page.: 3 of 3

Calibration Results

Function : pH Measurement

Performing three buffers standard curve by using buffer nominal pH (4,7,10)

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reading	Actual mV Reading (mV)	Uncertainty of pH Measurement (±)	Coverage factor k
pH Electrode S/N.: 5211504	4.007 7.000 10.010	4.006 7.000 10.007	181.1 4.9 -170.6	0.0044 0.0084 0.0066	2.00 2.00 2.00

Function : Temperature Measurement

(*) Without adjustment

This equipment was connected with Temperature Probe;

- Model : InLabExpert Pro-ISM

- Serial No. : 5211504

Dimension of probe

- Length : 120 mm.

- Diameter : 12 mm.

- Immersion Depth : 100 mm.

Calibration Point (°C)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty of measurement (± °C)	Coverage factor k
25.0	25.001	25.1	0.099	0.13	2.00

Remark : - UUC* = Unit Under Calibration

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

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Certificate of Calibration

Certificate No.: 25E1979/1
Page: 1 of 2

This Certificate was issued to replace to the Certificate No. 25E1979

Equipment : pH Meter
Manufacturer: Mettler Toledo
Model : SevenExcellence
Serial No.: B834291445
ID No.: RYG_EN0152
Condition As-Received: Used Item
Received Date: 12 June 2025
Calibration Date: 16 June 2025
Reference: 2506-0407DSC
Ambient Temperature: (23 ± 2) °C
Relative Humidity: (50 ± 10) %

This certificate may not be reproduced other than in full,
except with the prior written approval of the head of
Corporate Services 3: Equipment Calibration and Testing
Services.

Submitted by: **ALS Laboratory Group (Thailand) Co.,Ltd. Rayong Branch**

**616/10 Moo 5, T.Maenam Khu, A.Pluekdaeng,
Rayong 21140, Thailand**

Procedure used: Calibration were conducted using calibration procedure No. CP-E17 According to EURAMET cg-15.

Condition of this result of calibration

1.Reference standards instruments :

Instrument	Model	Serial No.	Certificate No.	Due Date
1) Multi-Product Calibrator	5500A	6315011	25E1627	19 May 2026

2.This result of calibration was made on requested at the point specified by customer.

3.The certificate is valid only to the item calibrated on date and place of calibration.

4.This measurement result is traceable to the International System of Unit maintained through:-

-Technology Promotion Association (Thailand-Japan), NSC-ONSC Accredited No. Calibration 0008

Calibrated by : Wutchareeporn Peethong
Issue Date : 01 July 2025

Approved Signatory :
[] Phalinee Prabpaipal
[x] Nuntawat Khamchai
[] Pongsagorn Boonyaporn



Cert. No.: 25E1979/1
Page: 2 of 2

Result of calibration :- (*) Without adjustment () After adjustment

Function:	DC voltage measurement	Range:	2000 mV	
	Standard Value	UUC* Reading	Error	Uncertainty
	(mV)	(mV)	(mV)	(± μV)
	-200.0000	-199.9	0.1	68
	-150.0000	-150.0	0.0	65
	-100.0000	-100.0	0.0	63
	-50.0000	-50.0	0.0	61
	0.0000	0.0	0.0	58
	50.0000	50.0	0.0	61
	100.0000	100.0	0.0	63
	150.0000	149.9	-0.1	65
	200.0000	199.9	-0.1	68

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

UUC* = Unit Under Calibration.

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SARTORIUS

Accredited by
NSC-TISI-TIS 17025
Calibration 0426



Calibration certificate

Calibration Certificate No. 25BKL0002

Object	Electronic non-automatic weighing instrument	This calibration certificate documents the traceability to national standards.
Manufacturer	Sartorius	Uncertainties of measurements are taken into account when only statements of compliance are made.
Type	MCE224S-2S00-U	This certificate was prepared by Sartorius Corporation in accordance to the current ISO/IEC 17025:2017 standard and Sartorius Work Instruction (Method) SOP WI 08.
Serial | QM Ident. no.	38101399 | RYG_EN0163	This certificate relate and apply this equipment only.
Customer	ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)	
	616/10 Moo 5 T.Maenam Khu, A.Pluek Daeng, Rayong 21140, Thailand.	
Order no.	2230	
Number of pages	4	
Date of calibration	20 Feb 2025	

REVIEW BY *Thavitak*
APPROVED BY *D. Kachen*
NEXT CAL DATE 20/02/26

This calibration certificate may not be reproduced other than in full except with the permission of NSC-TISI-TIS-17025 and the issuing laboratory. Calibration certificates without signature are not valid.

The user is obliged to have the object recalibrated at appropriate intervals.

Date 06 Mar 2025 Approval of the Calibration Certificate Person in charge
Chonchai Inthana *Kachen*
Mr. Chonchai Inthana Kachen Lalee

Calibration certificate No.: 25BKL0002

Calibration Certificate

Calibration object

Single range instrument

Model MCE224S-2S00-U
Serial Number 38101399
QM Ident. no | Inventory no. RYG_EN0163 | ---

Maximum capacity (Max. load) 220.0000 g
Measured range 220.0000 g
Scale interval 0.0001 g

Place of calibration

Address According to page 1
Department | Cost center Laboratory Department. | ---
Building | Floor --- | 1st Floor.
Room Balance Room.
Maximum temperature variation at place of calibration 5 K

Calibration procedure

EURAMET cg-18, V4.0 - Guidelines on the Calibration of Non-Automatic Weighing Instruments

Test equipment

Test equipment type	Test equipment ID	Valid until
Thermometer	MHB-382SD s/nB011342 Traceable to SI unit through DKSH	21 Aug 2025
Test weight set OIML R111 E2	Certificate No.M230819TS ,E2(Traceable to SI unit through TCS)	23 Aug 2025

Adjustment Status

The measuring device was internally adjusted before the calibration.

Environmental and measuring conditions

Date of calibration 20 Feb 2025
Temperature at place of calibration | Temp. diff. 24.4 °C | 0.6 K
Weights - Tplace
Measuring conditions The installation site is suitable. The device was levelled. Balance was loaded up to Max before test.
Comments Humidity 58.0 %RH.

Measurement results | Measurement uncertainties

Repeatability		Eccentricity	
Test load (nominal): 10 g | 200 g		Test load (nominal): 100 g	
10 g	200 g	100 g	
1	10.0000 g	200.0000 g	
2	10.0000 g	200.0000 g	
3	10.0000 g	200.0001 g	
4	9.9999 g	200.0000 g	
5	9.9999 g	200.0000 g	
6	10.0000 g	200.0001 g	
7	10.0000 g	200.0000 g	
8	10.0000 g	200.0000 g	
9	9.9999 g	200.0001 g	
10	10.0000 g	200.0000 g	
s = 0.00005 g		s = 0.00005 g	

Testload	Indication	Error	Expansion factor	Uncertainty	Uncertainty relative
L	I	E	k	U(E)	U _{rel} (E)
0.0100 g	0.0100 g	0.0000 g	2.00	0.00013 g	1.3 %
0.1000 g	0.1000 g	0.0000 g	2.00	0.00013 g	0.13 %
0.5000 g	0.5000 g	0.0000 g	2.00	0.00013 g	0.026 %
1.0000 g	1.0000 g	0.0000 g	2.00	0.00013 g	0.013 %
5.0000 g	5.0000 g	0.0000 g	2.00	0.00013 g	0.0026 %
10.0000 g	9.9999 g	-0.0001 g	2.00	0.00013 g	0.0013 %
20.0000 g	20.0000 g	0.0000 g	2.00	0.00014 g	0.00068 %
50.0000 g	50.0001 g	0.0001 g	2.00	0.00015 g	0.00029 %
100.0000 g	100.0000 g	0.0000 g	2.00	0.00018 g	0.00018 %
200.0000 g	200.0000 g	0.0000 g	2.00	0.00028 g	0.00014 %
220.0000 g	220.0000 g	0.0000 g	2.00	0.00032 g	0.00015 %

Maximum error of indication $|E|_{\max} = 0.0001 \text{ g}$
U_{rel}(E) is the quotient of U(E) and test load L. The uncertainty of measurement U(E) is valid only if error E is considered. You will find reference notes on the uncertainty of measurement in use under: Appendix to the calibration certificate | Interpretation of measurement results.
Reference note: The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the documented Expansion factor, determined in accordance with the European Calibration Guideline EURAMET cg-18, V4.0. There is a 95 % probability that the value of the measurand will be in the assigned value range.

End of calibration certificate

Sartorius (Thailand) Co., Ltd.
129 Rama 9 Road, Huaykwang
10310 Bangkok

Verical®
Version 6.5

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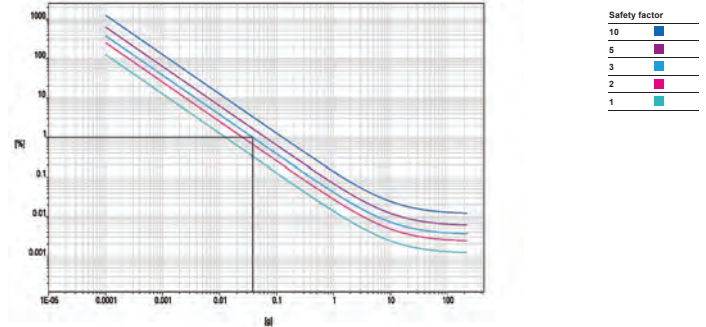
Uncertainty of measurement in use

Device adjusted before measurement Yes
Temperature deviation considered 1.5 K (isoCAL active)
Temperature coefficient considered 1 · 10⁻⁴/K
Uncertainty of the weighing result $U_{95}(W) = 0.00013 \text{ g} + 1.16 \cdot 10^{-4} \cdot R$

Reference note: The current uncertainty of measurement is calculated by entering of the reading R into this formula. In relation to this, there is no need for a correction of the indication error. The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied with an Expansion factor of 2, determined in accordance with the European Calibration Guideline EURAMET cg-18, V4.0. There is a 95 % probability that the value of the measurand will be in the assigned value range.

Indication in % from max load	Net indication R	Uncertainty $U_{95}(W)$	Uncertainty relative $U_{95}(W)_{\text{rel}}$
1 %	2.2000 g	0.00016 g	0.0071 %
25 %	55.0000 g	0.00077 g	0.0014 %
50 %	110.0000 g	0.0014 g	0.0013 %
75 %	165.0000 g	0.0020 g	0.0012 %
100 %	220.0000 g	0.0027 g	0.0012 %

Graphic realization of the relative uncertainty of measurement | process accuracy



Displayed example

Process accuracy 1.00 %
Safety factor 3
Minimum sample weight 0.0381 g

Sartorius (Thailand) Co., Ltd.
129 Rama 9 Road, Huaykwang
10310 Bangkok

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Version 6.5

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SCG **Metrology Center**
SCI ECO Services Company Limited
51 Moo 8, Tubkwang, Kaeng Khoi, Saraburi, Thailand 18260
Bangkok Tel : +668 9205 8851 , +669 81924 0059
Saraburi Tel : +669 8247 2360
Website : www.scieco.co.th E-Mail : calibrate@scg.co.th

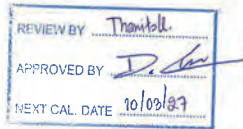


Certificate No. T251530

Page 1 of 3

Certificate of Calibration

Equipment : Chamber (Oven)
Manufacturer : MEMMERT
Model : UF 110
Serial No. : B416.2420
Customer Code : RYG_EN0012
ID No. : T6444A5
Customer : ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
616/10 Moo 5 T.Maenamkoo,
A.Pluakdaeng, Rayong 21140
Customer Location : ENVIRONMENT LABORATORY
Date of Receipt : 3 September 2025
Calibrated By : Sujjar Naknakred (Site Calibration Manager)
Approved By : Boonchai Suriyawong (Site Calibration Manager)
Date of Issue : 17 SEP 2025



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

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

SCG **Metrology Center**
SCI ECO Services Company Limited
51 Moo 8, Tubkwang, Kaeng Khoi, Saraburi, Thailand 18260
NSC-TISI-TIS 17025 CALIBRATION 0244

Certificate No. T251530

Page 2 of 3

Calibration Report

Equipment : Chamber (Oven)
Date of Calibration : 10 September 2025
Environment : Temperature : 35.7-36.6 °C
Line Voltage : 226.8-233.7 V
Relative Humidity : 55 - 65 %RH

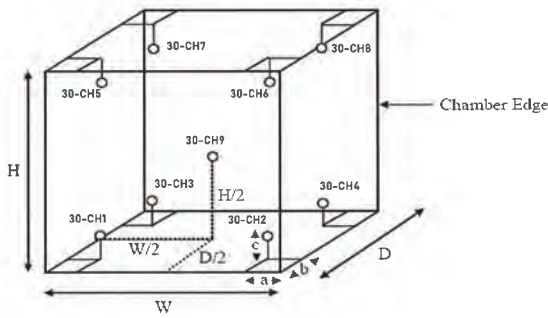
Condition of this results of calibration :

- This equipment was calibrated by insert nine resistance thermometer detectors into its chamber , the other one resistance thermometer detector use for ambient temperature measurement . The calibration was done in according to WI-T20 (based on ASTM E145-94 (Reapproved 2019) and AS2853-1986) .
All data show below were final values and the initial data from customer request . The temperature scale used was based on ITS - 90 .
- Reference Standard Instrument :

Instrument	Model	Instrument No.	Certificate No.	Due Date
RTD	100 ohm	30-(CH1-10)	T242203	9 November 2025
DATA LOGGER	34970A	T47	T242203	9 November 2025
- This certificate is traceable to :
National Institute of Metrology (Thailand) through Metrological Center (NSC-TISI-TIS 17025 CALIBRATION 0244 .
- Condition of calibrated item : good
Equipment Description :
Time Constant 3 Hour 29 Minute At 104 °C
Fresh Air Damper ☒ Open ☒ Min ☐ Medium ☐ Max
☐ Close
☐ Not Available
- Adjustment :
() without adjustment (X) after adjustment

Approved By : Boonchai Suriyawong

Calibration Report



Remark : Internal Dimensions of Chamber : W (Width) = 56 cm., H (Height) = 48 cm. and D (Depth) = 40 cm.
Size of Installed Standard sensor number 30-CH1 to number 30-CH9 : a = 5 cm., b = 5 cm. and c = 5 cm.
Size of Installed Standard sensor number 30-CH9 : W/2 = 56 cm./2, H/2 = 48 cm./2 and D/2 = 40cm./2

Measurement Results

Average Standard Reading at each position (°C)									
Calibration Point	30-CH1	30-CH2	30-CH3	30-CH4	30-CH5	30-CH6	30-CH7	30-CH8	30-CH9
104	104.02	103.70	104.01	104.16	104.11	104.08	104.01	104.33	103.61
190	180.67	178.78	180.38	179.85	179.16	180.27	180.98	181.04	179.49

Chamber (Oven)		Temperature Distribution					
Setting °C	Reading (°C)		Average (°C)	Stability (± °C)	Uniformity (°C)	Uncertainty (± °C)	Coverage Factor k
	Min	Max					
104.0	103.9	104.1	104.00	0.08	0.61	0.42	2.00
180.0	179.9	180.1	180.00	0.21	1.51	0.52	2.00

* The quoted uncertainty exclude "uniformity"

The calibration result apply only the above calibrated item.

The result of test was found accurate as shown on date and place of test only.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k which for a t-distribution, providing a level of confidence of approximately 95 %.

End of Certificate.

Approved By:

FM-TL07 102/27-03-68

Certificate of Calibration

Cert. No.: 25LM10
Page.: 1 of 2

Equipment : DO Meter with Sensor
Manufacturer : YSI
Model : 5000-115V
Serial No. : 15E102796
ID No. : RYG_EN0032

Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd.
(Rayong Branch)
616/10 Moo 5 T. Maenam Khu, A. Pluakdaeng,
Rayong 21140 Thailand
Location : TPA On Site Calibration Laboratory

Received Order : 17 January 2025
Calibrated Date : 20 January 2025
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %
AC Line Voltage : (220 ± 22) V

Calibrated by : Warakorn Lerngatrakul

Approved by :

() Chakrit Waewwanjua
(✓) Suwit Imjai
() Kunchit Promprat

Issue Date : 23 January 2025

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full, except with the prior written Approval of the head of Corporate Services 3 : Equipment Calibration and Testing Services.



Equipment : DO Meter with Sensor
Condition As-Received : Used Item
Reference : 2501-0600DSC-2

Cert. No.: 25LM10
Page.: 2 of 2

Procedure Used :-

Calibration were conducted using in-house calibration procedure CP-OT01 according to comparison with Industrial Platinum Resistance Thermometer (IPRT) into Temperature Bath.

The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument	Serial No.	Cert. No.	Traceable	Due Date
1) Digital Thermometer	2188080	2411022	TPA	17 Sep 2025

2. This certificate is valid only to the item calibrated on date and place of calibration.
3. This certification is traceable to the International System of Unit.

Remark : TPA : Technology Promotion Association (Thailand - Japan)

Result of Calibration :- (*) Without Adjustment

Function : Temperature measurement.

This instrument was connected with temperature sensor, S/N.: 15E100464

Calibration Point (°C)	Immersion Depth (mm)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty (± °C)	Coverage Factor k
20.00	60	20.002	19.81	-0.192	0.15	2.00

UUC* : Unit Under Calibration

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

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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3 : EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-3000 FAX. 0-2719-9484

Certificate of Testing

Cert.No.: 25TW15
Page.: 1 of 2

Equipment : DO Meter
Manufacturer : YSI
Model : 5000-115V
Serial No. : 15E102796
ID No. : RYG_EN0032
Received Date : 17 January 2025
Test Date : 20 January 2025
Reference : 2501-0600DSC-1
Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd.
(Rayong Branch)
616/10 Moo 5, T.Maenam Khu, A.Pluaekdaeng,
Rayong 21140, Thailand

Laboratory Condition : Temperature (25 ± 5) °C
Humidity (50 ± 20) %
Test Procedure : In - house method : CP-CH9
by Comparison Technique with Azide Modification Method

Tested by : Walalak Sirithean

Approved by :

() Pornthippa Tameyakul
() Ponpan Paipim
(✓) Saithip Meangmai

Issue Date : 21 January 2025



Cert.No.: 25TW15
Page.: 2 of 2

Condition of this result of calibration

1. Reference Standard Instruments :

This certification is traceable to the International System of Unit through the reference standards laboratory of Industrial Calibration Center, Technology Promotion Association (Thailand-Japan).

Instruments	Serial No.	ID No.	Certificate No.	Due Date
1. Burette	-	130BU10	23CG1172	22 Mar 2025
2. Balance	14233821	110RC001	24MM131	04 July 2025

2. Standard Material :-

Material	Manufacturer	Lot.No.	Assay
Sodium Thiosulfate 5-Hydrate AR	KEMAUS	2203162447	99.6%

Result : Dissolved Oxygen Meter Adjustment With Air 100 %
Dissolved Oxygen Probe No.: 15E100464

Titration Method (Azide Modification Method) (mg/L)	DO Meter Reading (mg/L)	Standard Deviation (mg/L)
8.20	8.20	0.0084

This report was certified only for the instrument we tested. It is allowable to use for study
Intend to use for advertising and referral purpose is prohibited. This report may not be reproduced
other in full, without written approval of the laboratory

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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL.0-2717-3000-29 FAX.0-2719-9484



Certificate of Calibration

Cert. No.: 24TM1663
Page : 1 of 3

Equipment : Low Temp. Incubator

Manufacturer : Memmert

Model : IPP750

Serial No. : V818.0084

ID No. : RYG_EN0154

Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd. Rayong Branch
616/10 Moo 5, T.Maenam Khu,
A.Pluakdaeng,
Rayong 21140, Thailand
BOD Room

Location :

Received Order : 01 November 2024
Calibration Date : 01 November 2024
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %
AC Line Voltage : (220 ± 22) V

Calibrated by : Krisda Malee

Approved by :

() Ponpan Paipim
() Suwit Imjai
(✓) Kunchit Promprat

Issue Date : 07 November 2024

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full, except with the prior written
Approval of the head of Corporate Services 3: Equipment Calibration and Testing Services.



Equipment : Low Temp. Incubator
Condition As-Received : Used Item
Reference : 2411-0002OC-1

Cert. No.: 24TM1663
Page : 2 of 3

Procedure Used :-

Calibration were conducted using calibration procedure CP-OT02 based on TLAS G-20 according to direct measurement method with Data Acquisition which connected with Resistance Temperature Detector (RTD).
The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument	Serial No.	Cert. No.	Traceable	Due Date
1) Data Acquisition	MY44073381	24LM73	TPA	18 May 2025

2. This certificate is valid only to the item calibrated on date and place of calibration.

3. This certification is traceable to the International System of Unit.

Remark : TPA : Technology Promotion Association (Thailand - Japan)

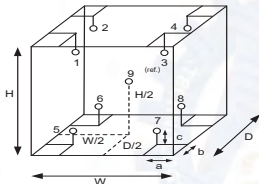
Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

Fresh air setting : Close

Environment during calibration		
	Beginning	Finished
Temp. (°C)	24	25
REL.Humid. (%)	55	53
AC Supply (Volt)	220	221

Position :	Ref. Std. ID No.:
1	1RTD-2/1
2	1RTD-2/2
3	22-01RTD-03
4	1RTD-2/4
5	1RTD-2/5
6	1RTD-2/6
7	23-01RTD-07
8	1RTD-2/8
9 (ref.)	23-01RTD-09



Probe Installation Details :

Dimension of Chamber :	
a =	10 cm
b =	10 cm
c =	10 cm
D =	0.60 m
W =	1.0 m
H =	1.2 m
Capacity =	0.72 m ³



Equipment : Low Temp. Incubator
Condition As-Received : Used Item
Reference : 2411-0002OC-1

Cert. No.: 24TM1663
Page : 3 of 3

Result of Calibration :-

(*) Without Adjustment

Function of UUC* : Temperature Source

Fresh air setting : Close

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Coverage Factor k
20.0	20.0	20.0	0.026	0.26	0.53	2

Calibration Point (°C)	Measured Temperature (°C)									Uncertainty (± °C)
	1	2	3	4	5	6	7	8	9 (ref.)	
20.0	20.071	19.915	20.273	20.179	19.977	19.782	20.056	20.026	20.033	0.30

Average* : The average of 30 values in each position.

Temperature stability : One-half of the greatest maximum difference of measured temperature at any one sensor.

Temperature uniformity : The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.

Overall Variation : The Difference of the maximum and minimum measured temperatures throughout observation.

UUC* : Unit Under Calibration

Note : The reported uncertainty of measurement was included stability and excluded uniformity .

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

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Certificate of Calibration

Cert.No.: 25CG3668
Page.: 1 of 2

Equipment : Burette
Capacity : 50 mL
Serial No. : -
ID. No. : RYG_EN0216
Manufacturer : Witeg
Made in : Germany
Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd.
Rayong Branch
616/10 Moo 5 T.MaenamKoo, A.Pluekdaeng
Rayong 21140, Thailand
Ambient Temperature : (20 ± 2.5) °C
Relative Humidity : (50 ± 10) %
Barometric Pressure : 753 mmHg
Calibration Procedure : ASTM E 542 - 01
Calibrated by : Srisuda Khamtha
Approved by :
() Ponpan Paipim
(✓) Chakrit Waewwanjua
Issue Date : 19 September 2025

REVIEW BY *Thanitak*
APPROVED BY *D. Khamtha*
NEXT CAL DATE 18/09/26

The Uncertainties are for a confidence probability of approximately 95%
This certificate may not be reproduced other than in full, except with the prior written approval of the head of Corporate Services 3: Equipment Calibration and Testing Services.



Equipment : Burette
Received Date : 16 September 2025
Condition As-Received : Used Item
Calibration Date : 18 September 2025
Reference : 2509-0564DSC-3

Cert.No.: 25CG3668
Page.: 2 of 2

Condition of this result of calibration

- Reference Standard Instruments :

Instruments	Model	Serial No.	ID. No.	Certificate No.	Traceability	Due date
1) Balance	XP205	B134206712	140RC007	25MM296	TPA	16 July 2026
2) Humidity/Baro/Temp	MHB-382SD	AM.42259	140EC016	25H1616	TPA	14 Aug 2026
3) Digital Thermometer	HH376	230806555	140EC013	25I1740	TPA	17 Jan 2026

This measurement result is traceable to SI Unit
The certificate is valid only to the item calibrated on date and place of calibration.
3. True value is converted to true volume at the standard temperature of 20 °C

Calibration result:

Nominal capacity (mL)	Reading (mL)	Uncertainty (± mL)	k Factor
10	10.0264	0.0082	2.00
25	25.0141	0.0087	2.00
50	49.9952	0.010	2.00

Remark mL = cm³

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

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Certificate No. T242075

Page 1 of 3

Certificate of Calibration

Equipment : Liquid Bath (Water)
Manufacturer : Memmert
Model : WNE29
Serial No. : L623.0105
Customer Code : RYG_EN0220
ID No. : T5650A5
Customer : ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
616/10 Moo 5 T.Maenam Khu,
A.Pluekdaeng, Rayong 21140
Customer Location : Wet Chemistry Lab
Date of Receipt : 11 December 2024
Calibrated By : Aliphong Rongrat (Technician)
Approved By : *Boonchal* / Boonchal Suriyawong (Site Calibration Manager)
Date of Issue : 20 DEC 2024

REVIEW BY *Thanitak*
APPROVED BY *D. Khamtha*
NEXT CAL DATE 19/12/25

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

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



Certificate No. T242075

Page 2 of 3

Calibration Report

Equipment : Liquid Bath (Water)
Date of Calibration : 19 December 2024
Environment : Temperature : 25.3-25.9 °C
: Line Voltage : 221.4-225.4 V
: Relative Humidity : 55 - 65 %RH

Condition of this results of calibration :

- This equipment was calibrated by insert five resistance thermometer detectors into its water bath , the other one thermocouple type T use for ambient temperature measurement . The calibration was done in according to WI-T36 (based on ASTM E715-80 (Reapproved 2001)).
All data show below were final values and the initial data from customer request . The temperature scale used, was based on ITS - 90 .
- Reference Standard Instrument :

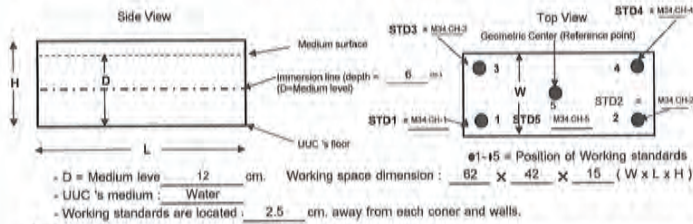
Instrument	Model	Instrument No.	Certificate No.	Due Date
RTD	100 OHM	M34 (CH1-CH5)	T240400	16 March 2025
DATA LOGGER	34970A	T193	T240400	16 March 2025
- This certificate is traceable to :
National Institute of Metrology (Thailand) through Metrological Center (NSC-TIS1-TIS 17025 CALIBRATION 0244.)
- Condition of calibrated item : good
Equipment Description :
Time Const. 1 Hour 30 Minute At 63 °C
- Adjustment :
(X) without adjustment () after adjustment

Approved By, *Boonchal*

Certificate No. T242075

Page 3 of 3

Calibration Report



Measurement Results:

Average Standard Reading at each position (°C)

Calibration Point	M34.CH-1	M34.CH-2	M34.CH-3	M34.CH-4	M34.CH-5
63	62.87	63.00	62.88	62.98	63.22
85	84.76	85.14	84.89	85.07	85.24

Liquid Bath (Water)		Temperature Distribution				
Setting (°C)	Reading (°C)		Average (°C)	Stability (°C)	Uniformity (°C)	Uncertainty (°C)
	Min, Max	Average				
63.0	63.0	62.99	0.07	0.25	0.23	2.00
85.0	85.0	85.02	0.13	0.35	0.26	2.00

The calibration result apply only the above calibrated item.

The result of test was found accurate as shown on date and place of test only.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k which for a t-distribution, providing a level of confidence of approximately 95%.

Approved By:

FM-L15118/18-08-66

Certificate No. T241120

Page 1 of 4

Certificate of Calibration

Equipment : Chamber (Cold Room)

Manufacturer : MODULAR

Model : IREVCOHCOO

Serial No. : C00351459

Customer Code : RYG_EN0184

ID No. : T1939A5

Customer : ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)

REVIEW BY:
APPROVED BY:
NEXT CAL DATE: 11/12/25

616/10 Moo 5 T.Maenam Khu,
A.Pluckdaeng, Rayong 21140

Customer Location : Laboratory

Date of Receipt : 5 June 2024

Calibrated By : Sujjar Naknakred (Site Calibration Manager)

Approved By: Preecha Phisassanthikul (Temperature Calibration Manager)

Date of Issue : 12 JUN 2024

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

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

FM-L141179X-08-66

Certificate No. T241120

Page 2 of 4

Calibration Report

Equipment : Chamber (Cold Room)

Date of Calibration : 11 June 2024

Environment : Temperature : 23.1-24.1 °C

Line Voltage : 222.3-226.3 V

Relative Humidity : 55-65 %RH

Condition of this results of calibration :

1. This equipment was calibrated by insert nine standard thermocouples type T into its chamber , the other one standard thermocouples type T use for ambient temperature measurement . The calibration was done in according to WI-T20 (based on ASTM E145-94 (Reapproved 2001) and AS2853-1986).

All data show below were final values and the initial data from customer request . The temperature scale used was based on ITS - 90 .

2. Reference Standard Instrument :

Instrument	Model	Instrument No.	Certificate No.	Due Date
TC	TYPE T	TN161-TN170	T240713	19 April 2025
TC	TYPE T	TN171-TN180	T240713	19 April 2025
DATA LOGGER	34970A	T149	T240713	19 April 2025

3. This certificate is traceable to :

National Institute of Metrology (Thailand) through Metrological Center (NSC-TISI-TIS 17025 CALIBRATION 0244)

4. Condition of calibrated item : good

Equipment Description :

Time Constant: 3 Hour 30 Minute At 3 °C

Fresh Air Damper: ☐ Open ☐ Min ☐ Medium ☐ Max

☐ Close

☒ Not Available

5. Adjustment :

() Without adjustment (X) After adjustment

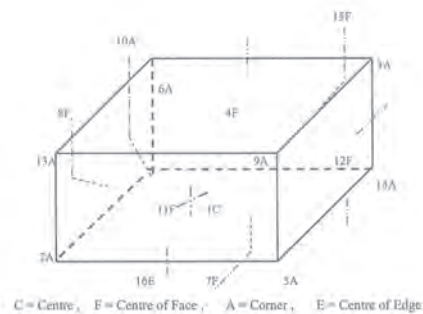
Approved By:

FM-L141179X-08-66

Certificate No. T241120

Page 3 of 4

Calibration Report



C = Centre, F = Centre of Face, A = Corner, E = Centre of Edge

1C = TN161	11F = TN171
2A = TN162	12F = TN172
3A = TN163	13A = TN173
4F = TN164	14A = TN174
5A = TN165	15F = TN175
6A = TN166	16E = TN176
7F = TN167	
8F = TN168	
9A = TN169	
10A = TN170	

Approved By:

FM-L141179X-08-66



Certificate No. T241120

Page 4 of 4

Calibration Report

Measurement Results:

Calibration Point	Average Standard Reading at each position (°C)							
	TN161	TN162	TN163	TN164	TN165	TN166	TN167	TN168
3	2.73	2.70	2.77	2.78	2.99	2.35	3.09	3.21
	TN169	TN170	TN171	TN172	TN173	TN174	TN175	TN176
	3.08	2.90	3.39	3.01	3.92	3.81	3.42	3.42

Chamber (Cold Room)			Temperature Distribution				
Setting (°C)	Reading (°C)		Average (°C)	Stability (±°C)	Uniformity (°C)	Uncertainty (±°C)	Coverage Factor k
	Min	Max					
3.0	2.9	4.4	3.7	2.97	1.32	1.13	2.02

* The quoted uncertainty exclude \pm uniformity \pm

The result of test was found accurate as shown on date and place of test only.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k, which gives a t-distribution, providing

a level of confidence of approximately 95 %.

Approved By:



Certificate of Calibration

Equipment: SPECTROPHOTOMETER
Model: DR6000
Serial No. (or ID.): 1627845 (RYG_EN0037)
Manufacturer: HACH
Condition: In Condition

Certificate No.: C06250108
Issued Date: 18 March 2025
Job No.: WO-00064379
Page: 1 of 3

Customer: ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch) Photchanas
616/10 Moo 5 T.Maenam Khu,
A.Pluakdaeng, Rayong 21140, Thailand.

APPROVED BY:
NEXT CAL DATE: 18/04/26

Environment Condition: Temperature 24.4 °C \pm 0.3 °C
Humidity 60.8 %RH \pm 3.5 %RH

Calibration Place: ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)
(Wet Chemistry Lab)
616/10 Moo 5 T.Maenam Khu, A.Pluakdaeng, Rayong 21140, Thailand.

Calibration By: Mr.Preecha Phooarsai

Calibration Date: 18 March 2025

The Method used: In house method, CAL-WI-24, base on ASTM E 275-08 and ASTM E 387-04

Traceability: This certificate is traceable to the CRM maintained by National Institute of Standards and Technology (NIST) through Starna Scientific Limited.

The standard for Wavelength Certificate No. 111583 and 111584
The standard for Photometric Certificate No. 9114984 and 111588
The standard for Stray light Certificate No. 111586 and 111585
The standard for Spectral resolution Certificate No. 111587

(Mr. Preecha Phooarsai)
Person in charge

(Miss Kaewkan Suradech)
Authorized signatory

This certificate is issued for the units of measurement according to the International System of Units (SI). It provides traceability of measurement to international or national standard or other recognized national standard laboratories.

The measurement uncertainty stated is the expanded uncertainty which is obtained from the standard uncertainty multiplied by the coverage factor (k=2) to provide a level of confidence of approximately 95%.

These results may be affected by deviations from specified conditions. The results relate only to the items tested, calibrated or sampled. The report shall not be reproduced except in full without approval of DKSH Technology Limited.

DKSH Technology Limited
2533 Sukhumvit Road, Bangkok, Phra Prachin, Bangkok 10260
Phone: +66 2638 7000 Email: info.calibration@dksh.com Website: www.dksh.com/calibration

Delivering Growth - In Asia and Beyond.

CAL-EM-C06-16-11 Mar 2024



Certificate No.: C06250108

Page 2 of 3

Calibration Results:

Without Adjustment

Wavelength Accuracy (nm). The spectral bandwidth of Std at 2 nm and UUC at 2 nm			
Standard Wavelength	Unit Under Calibration	Correction	Uncertainty
418.61	418.5	0.11	0.13
536.66	536.7	-0.04	0.13
637.98	638.3	-0.32	0.13
748.48	748.6	-0.32	0.13
807.03	807.5	-0.47	0.13

Photometric Accuracy (Absorbance)			
Wavelength	Standard absorbance	Unit Under Calibration	Correction
420 nm	0.0000	0.000	0.0000
	0.2930	0.291	0.0020
	0.5168	0.518	-0.0012
	1.0298	1.031	-0.0012
440 nm	0.0000	0.000	0.0000
	0.2887	0.285	0.0017
	0.5073	0.508	-0.0007
	1.0083	1.009	-0.0007
465 nm	0.0000	0.000	0.0000
	0.2516	0.250	0.0016
	0.4595	0.461	-0.0015
	0.9334	0.935	-0.0016
545.1 nm	0.0000	0.000	0.0000
	0.2461	0.246	0.0001
	0.4652	0.466	-0.0008
	0.9468	0.948	-0.0012
590 nm	0.0000	0.000	0.0000
	0.2594	0.259	0.0004
	0.5040	0.505	-0.0010
	1.0032	1.004	-0.0008
635 nm	0.0000	0.000	0.0000
	0.2579	0.258	-0.0001
	0.4971	0.497	0.0001

DKSH Technology Limited
2533 Sukhumvit Road, Bangkok, Phra Prachin, Bangkok 10260
Phone: +66 2638 7000 Email: info.calibration@dksh.com Website: www.dksh.com/calibration

Delivering Growth - In Asia and Beyond.

CAL-PM-C06-16-11 Mar 2024



Certificate No.: C06250108

Page 3 of 3

Calibration Results:

Without Adjustment

Photometric Accuracy (Absorbance)				
Wavelength	Standard absorbance	Unit Under Calibration	Correction	Uncertainty
235 nm	0.0000	0.000	0.0000	0.0080
	0.7355	0.738	-0.0025	0.0080
257 nm	0.0000	0.000	0.0000	0.0080
	0.8574	0.857	0.0004	0.0080
313 nm	0.0000	0.000	0.0000	0.0080
	0.2864	0.290	-0.0036	0.0080
350 nm	0.0000	0.000	0.0000	0.0080
	0.6374	0.637	0.0004	0.0080
Stray light *				
Standard: cut-off	UUC: Wavelength (nm)	UUC: Transmission (%T)	Absorbance (A)	
280.62 +/- 0.11 nm	260.6	1.7	1.770	
391.44 +/- 0.11 nm	391.4	1.4	1.854	
Spectral Resolution *				
Nominal Concentration 0.02 % w/v	Peak	Trough	Ratio	SBW
Standard Wavelength (nm)	268.66	266.69	1.38	2.00
UUC: Wavelength (nm)	268.2	266.2		
Std Absorbance (A)	0.4566	0.2780		
UUC: Absorbance (A)	0.413	0.299		

* Calibration Marked "Not TISI Accredited" in this Certificate have been included for completeness.

The End of Certificate

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Phone: +66 2638 7000 Email: info.calibration@dksh.com Website: www.dksh.com/calibration

Delivering Growth - In Asia and Beyond.

CAL-PM-C06-16-11 Mar 2024



ใบตรวจสอบสภาพเครื่องวัดสิ่งแวดล้อม

เลขที่ใบงาน: WO-00064379

ชนิดเครื่องมือ: SPECTROPHOTOMETER รุ่น: DR6000

หมายเลขเครื่อง: 1627845

ตรวจสอบ (วัน)		รายการตรวจเช็ค	ตรวจสอบ (ค่า)		หมายเหตุ
18 Mar 2025			18 Mar 2025		
ปกติ	ไม่ปกติ		ปกติ	ไม่ปกติ	
		General			
<input checked="" type="checkbox"/>	<input type="checkbox"/>	1. ความสมบูรณ์เครื่อง	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	2. ความสะอาด (ช่องใส่ตัวอย่าง, ภายใน-นอกเครื่อง)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. สวิตช์ ปิด - เปิด เครื่อง (On-Off Switch)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. ปุ่มกด (Keypad)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	5. หน้าจอ (Display, Screen Contrast)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
		Spectrophotometer			
<input type="checkbox"/>	<input type="checkbox"/>	6. แรงดันไฟฟ้า (Battery Backup) >= 2.5 VDC	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	7. ตัวหมุนเลือกความยาวคลื่น (Wavelength Control)	<input type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	8. ความยาวคลื่น (Wavelength Check)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	9. แสงยูวีแคดเมียม (UV < 3,000 hour)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	10. แสงที่มองเห็นแสง (Visible < 5,000 hour)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	11. ช่องวัดหลายตัวอย่าง (Carousel Module)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
		pH Meter and Conductivity Meter			
<input type="checkbox"/>	<input type="checkbox"/>	12. อิเล็กโทรด (Electrode and Connection Cable)	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	13. ระดับสารละลายใน Electrode (Level KCl)	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	14. ฝาปิดกันฝุ่น Electrode (Dust Protection Hood)	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	15. ขาตั้งอิเล็กโทรด (Stand)	<input type="checkbox"/>	<input type="checkbox"/>	
		Turbidimeter			
<input type="checkbox"/>	<input type="checkbox"/>	16. ค่าความทึบที่ต่ำสุด (No Sample)	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	17. ระดับการส่องสว่างของแสง (>= 2.5 ไม่น้อย 3.0)	<input type="checkbox"/>	<input type="checkbox"/>	
		Automatic titrator			
<input type="checkbox"/>	<input type="checkbox"/>	18. สภาพ Piston Burettes	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	19. Function Rinsing and Dosing	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	20. ระบบท่อสายยางและอุปกรณ์ประกอบ	<input type="checkbox"/>	<input type="checkbox"/>	

เซ็นเซอร์อุณหภูมิ: * 656.1nm = 656.1nm

* 486.0nm = 485.7nm

Mr.Preecha Phooarsai
Service Engineer

SCG Metrology Center
SCI ECO Services Company Limited
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Phone: +66 2629 7000 Email: info.pab@scg.co.th Website: www.pab@scg.co.th

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CAL-FM-R31-03: 20 Jul 2022

FM-TL04 102/27-03-68



Metrology Center

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Saraburi Tel : +669 8247 2360

Website : www.scoeco.co.th E-Mail : calibrate@scg.co.th

Certificate No. T251529

Certificate of Calibration

Page 1 of 3

Equipment : DIGESTION UNIT

Manufacturer : Gerhardt, Germany

Model : KT - 20S

Serial No. : 572021009

Customer Code : RYG_EN0188

ID No. : T6452A5

Customer : ALS Laboratory Group (Thailand) Co.,Ltd. (Rayong Branch)

616/10 Moo 5 T.Maenamkoo,

A.Plukdaeng, Rayong 21140

Customer Location : ENVIRONMENT LABORATORY

Date of Receipt : 3 September 2025

Calibrated By : Sujjar Naknakred (Site Calibration Manager)

Approved By : Boonchai Suriyawong (Site Calibration Manager)

Date of Issue : 17 SEP 2025

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

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



Metrology Center

SCI ECO Services Company Limited

51 Moo 8, Tubkwang, Kaeng Khoi, Saraburi, Thailand 18260

Certificate No. T251529

Page 2 of 3

Calibration Report

Equipment : DIGESTION UNIT
Date of Calibration : 10 September 2025
Environment : Temperature : 21.7 - 24.3 °C
Line Voltage : 226.9 - 232.1 V
Relative Humidity : 55 - 65 %RH

Condition of this results of calibration :

- This equipment was calibrated by insert four standard thermocouples type S into its chamber , the other one thermocouple type T use for ambient temperature measurement . The calibration was done in according to WI-T10.
- Reference Standard Instrument :

Instrument	Model	Instrument No.	Certificate No.	Due Date
TC	Type S	M20A1-(CH1-CH4)	T250750	14 May 2026
DATA LOGGER	34970A	T261	T250750	14 May 2026
- This certificate is traceable to :
National Institute of Metrology (Thailand) through Metrological Center (NSC-TISI-TIS 17025 CALIBRATION 0244.)
- Condition of calibrated item : good
Equipment Description :
Time Constant 1 Hour 46 Minute At 380 °C
Fresh Air Damper ☐ Open ☐ Min ☐ Medium ☐ Max
☒ Close
☒ Not Available
- Adjustment :
(X) without adjustment () after adjustment

Approved By

FM-TL05 102/27-03-68



Metrology Center

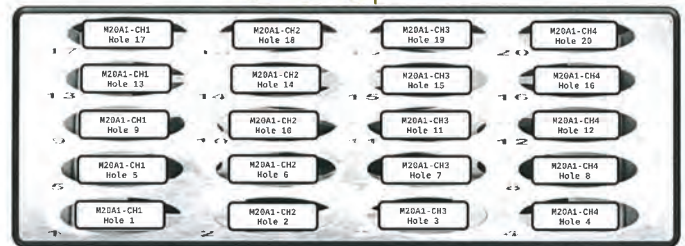
SCI ECO Services Company Limited

51 Moo 8, Tubkwang, Kaeng Khoi, Saraburi, Thailand 18260

Certificate No. T251529

Page 3 of 3

Calibration Report



DISPLAY CONTROL (FRONT)

Measurement Results				Position of Standards at Block											
Cal.Point	Setting	Reading	STD.	M20A1-CH1 Hole 1	M20A1-CH2 Hole 2	M20A1-CH3 Hole 3	M20A1-CH4 Hole 4	M20A1-CH1 Hole 5	M20A1-CH2 Hole 6	M20A1-CH3 Hole 7	M20A1-CH4 Hole 8	M20A1-CH1 Hole 9	M20A1-CH2 Hole 10	M20A1-CH3 Hole 11	M20A1-CH4 Hole 12
380	360	360	Max °C	381.2	380.5	381.0	381.0	379.2	380.8	381.3	377.7	382.8	381.5	381.5	381.5
			Min °C	380.7	380.0	380.4	380.5	378.6	380.1	380.9	377.2	381.9	380.9	381.9	380.9
			Average °C	381.0	380.3	380.7	380.8	378.9	380.4	381.1	377.5	382.4	381.2	381.2	381.2
			Stability °C	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.2	0.5	0.3	0.3	0.3
Cal.Point	Setting	Reading	STD.	M20A1-CH3 Hole 13	M20A1-CH4 Hole 14	M20A1-CH1 Hole 15	M20A1-CH2 Hole 16	M20A1-CH3 Hole 17	M20A1-CH4 Hole 18	M20A1-CH1 Hole 19	M20A1-CH2 Hole 20	M20A1-CH3 Hole 21	M20A1-CH4 Hole 22	M20A1-CH1 Hole 23	M20A1-CH2 Hole 24
380	360	360	Max °C	382.5	377.2	378.7	378.8	378.5	379.9	383.3	381.0	382.4	381.1	381.1	381.1
			Min °C	381.7	376.5	378.5	378.5	378.1	379.5	382.7	380.6	381.5	380.4	380.4	380.4
			Average °C	382.1	376.8	378.6	378.7	378.3	379.7	383.0	380.8	382.0	380.8	380.8	380.8
			Stability °C	0.4	0.4	0.1	0.2	0.2	0.2	0.3	0.2	0.4	0.4	0.4	0.4

The expanded uncertainty of temperature measurement was ± 1.8 °C

The calibration result apply only the above calibrated item.

The result of test was found accurate as shown on date and place of test only.

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 % .

End of Certificate.

Approved By

FM-TL05 102/27-03-68



Certificate of Calibration

Cert. No.: 25LM131
Page.: 1 of 2

Equipment : DO Meter with Sensor
Manufacturer : Mettler Toledo
Model : Seven2Go S9
Serial No. : C131262003
ID No. : RYG_FS0547
Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd. Rayong Branch
616/10 Moo 5, T.Maenam Khu, A.Pluakdaeng,
Rayong 21140, Thailand
Location : TPA On Site Calibration Laboratory
Received Order : 11 August 2025
Calibrated Date : 13 August 2025
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %
AC Line Voltage : (220 ± 22) V
Calibrated by : Warakorn Lernagatrakul
Approved by : Kunchit
() Chakrit Waewwanjua
() Suwit Imjai
(✓) Kunchit Promprat
Issue Date : 19 August 2025

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full, except with the prior written
Approval of the head of Corporate Services 3: Equipment Calibration and Testing Services.

REVIEW BY P.Hhaya.T.
APPROVED BY S.T.S.
NEXT CAL DATE 13/08/26



Equipment : DO Meter with Sensor
Condition As-Received : Used Item
Reference : 2508-0360DSC-4
Procedure Used :-

Cert. No.: 25LM131
Page.: 2 of 2

Calibration were conducted using in-house calibration procedure CP-OT01 according to comparison with Industrial Platinum Resistance Thermometer (IPRT) into Temperature Bath.
The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument	Serial No.	Cert. No.	Traceable	Due Date
1) Digital Thermometer	2188080	2411022	TPA	17 Sep 2025
2) This certificate is valid only to the item calibrated on date and place of calibration.				
3) This measurement result is traceable to the International System of Unit maintained through :				

Remark : TPA : Technology Promotion Association (Thailand - Japan)

Result of Calibration :- (*) Without Adjustment
Function : Temperature measurement.

This instrument was connected with temperature sensor, S/N.: 738590

Calibration Point (°C)	Immersion Depth (mm)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty (± °C)	Coverage Factor k
20.0	80	20.003	20.1	0.097	0.16	2.00

UUC* : Unit Under Calibration

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

-000-



Certificate of Testing

Cert.No.: 25TW151
Page.: 1 of 2

Equipment : DO Meter
Manufacturer : Mettler Toledo
Model : Seven2Go S9
Serial No. : C131262003
ID No. : RYG_FS0547
Received Date : 11 August 2025
Test Date : 13 August 2025
Reference : 2508-0360DSC-3
Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd. Rayong Branch
616/10 Moo 5, T.Maenam Khu, A.Pluakdaeng,
Rayong 21140, Thailand
Laboratory Condition : Temperature (25 ± 5) °C
Humidity (50 ± 20) %
Test Procedure : In - house method : CP-CH9
by Comparison Technique with Azide Modification Method
Tested by : Walalak Sirirthean
Approved by :
(✓) Chakrit Waewwanjua
() Ponpan Paipim
() Salthip Meangmai
Issue Date : 14 August 2025

Approved Signatory



Cert.No.: 25TW151
Page.: 2 of 2

Condition of this result of calibration

1. Reference Standard Instruments :

This measurement result is traceable to the International System of Unit through the reference standards laboratory of Industrial Calibration Center, Technology Promotion Association (Thailand-Japan).

Instruments	ID No.	Certificate No.	Due Date
1. Burette	130BU10	25CG1126	18 Mar 2027
2. Balance	110RC001	25MM316	02 July 2026

2. Standard Material :-

Material	Manufacturer	Lot.No.	Assay
Sodium Thiosulfate 5-Hydrate AR	KEMAUS	2203162447	99.6%

Result : Dissolved Oxygen Meter Adjustment With Air 100 %
Dissolved Oxygen Probe No.: 738590

Titration Method (Azide Modification Method)	DO Meter Reading (mg/L)	Standard Deviation (mg/L)
8.22	8.17	0.0055

This report was certified only for the instrument we tested.It is allowable to use for study
Intend to use for advertising and referral purpose is prohibited.This report may not be reproduced
other in full, without written approval of the laboratory

-000-



Agilent Technologies (Thailand) Limited
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Bangkok 10500 Thailand
Tel: +662 637 8363
Fax: +662 632 4334
Email: ccc-smt@agilent.com
Website: www.agilent.com/chem

Service Confirmation Number: 6905676103
Service Confirmation Date: 23.05.2024

Customer Contact:

ALS Laboratory Group (Thailand) Co
Ltd Head Office

104 Phatthanakan 40 Phatthanakan Rd
Khaeng Phatthanakan Khet Suan
TAX ID : 0105540004859
Chanattagarn.lmchom@alaglobal.com
27683068

Invoice To:

ALS Laboratory Group (Thailand) Co
Ltd Head Office

104 Phatthanakan 40 Phatthanakan Rd
Khaeng Phatthanakan Khet Suan

Delivery Site:

ALS Laboratory Group (Thailand) Co
Ltd Head Office

104 Phatthanakan 40 Phatthanakan Rd
Khaeng Phatthanakan Khet Suan

Location:

Room
Bldg
Lab
Dept

SERVICE REPORT

Customer Purchase Order Number:	Customer Number:
	70371013
Service Request:	Service Request Date:
Service Order:	Service Confirmation:
6006676091	6905676103

REVIEW BY Pongphen C.
APPROVED BY Sauwita N.
NEXT CAL. DATE 23 Mar 2026

Direct Inquiries to:

Contact Name: Customer Contact Center
Contact E-mail: ccc-smt@agilent.com
Contact Telephone: +662 637 8363
Contact Fax: +662 632 4334

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968 Rama 4 Road, Silom, Bangkok
Bangkok 10500 Thailand
Tax ID : 0105540004859

Original: Dikawat N.A. Bangkok Branch
309 Interchange 21 Building, Sukhovit Road, Klongtoey New
Sub-district, Wattana District, Bangkok 10110 Thailand
Acc. No: 012-4452-007
THB-Krung Thai Bank PCL
Siam Square Bldg. 416/1-2 Rama 1 Rd. Pathumwan, BKK 10330
Thailand

Page 1 of 3

Service Instrument:

Model Number	Model Description	Serial Number	System Handle	Parent Asset
SYS-ID-5100	ICP-DES 5100/5110 System			
G8010A	Agilent 5100 SVDV ICP-DES Spectrometer	MY18010005	ICP DES 5100	SYS-ID-5100
G8410A	SPS 4 Autosampler	AU15440754	ICP DES 5100	SYS-ID-5100

Service Items:

Item	Service/Part #	Description	Qty	Entitlement	Service Start	Service End
1000	EOO	Enterprise Operational Qualification	1.00	Agreement Entitlement - 100 % covered	22.09.2024	23.09.2024
1010	6610000100	Bottle ICP-DES Wavecal sol'n 500mL 5 ppm	1.00	Agreement Entitlement 100 % covered		
1020	5190-7001	Calibration blank - anion Spec HNO3	1.00	Agreement Entitlement 100 % covered		

Additional Information:**Metrological Center**

SCI ECO Services Company Limited

33/2 Moo 3, T.Banpa, A.Kaengkhoh, Saraburi 18110

Telephone : +66 2 586 5792-4 Fax : +66 2 586 5109

Website : www.scieco.co.th E-Mail : calibrate@scg.co.th



Certificate No. T250355

Page 1 of 6

Certificate of Calibration

Equipment : HEATING BLOCK
Manufacturer : Environmental Express
Model : SC 196
Serial No. : 6974CECW3285
Customer Code : BKK_EL0054
ID No. : T5306A3
Customer : ALS Laboratory Group (Thailand) Co.,Ltd.

REVIEW BY Tattaporn C.
APPROVED BY Sauwita N.
NEXT CAL. DATE 04.09.26

104 Phatthanakan 40, Phatthanakan Rd.,
Khaeng Phatthanakan, Khet Suan Luang, Bangkok 10250

Customer Location : Acid Digestion Lab
Date of Receipt : 26 February 2025
Calibrated By : Atiphong Rongrat (Technician)
Approved By : Boonchai / Boonchai Suriyawong (Site Calibration Manager)
Date of Issue : 27 MAR 2025

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

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

Service Confirmation Number: 6905676103
Service Confirmation Date: 23.05.2024

Service Information:

Problem Description: WU-00-10-5100-5001253655		
Service Provided: Complete GDHW 5100(CPOES) Equipment ID: BKK_EL0037, all test passed		
Service Overview Code: Reason Code: Scheduled Service Diagnosis Code: Scheduled Service Resolution Code: Scheduled Service		
Reported Hours: 4.0	Travel Hours: 2.0	
Customer Field Service Representative Name: Suwan Onkhem	Customer Field Service Representative Signature: <u>Suwan O.</u>	Date: 23 Sep 2024
Customer Name: CHANATTAGARN LIMCHOM	Customer Signature: <u>Pongphen C.</u>	Date: 23 Sep 2024
Additional Comments:		

Page 3 of 3



Metrological Center

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Website : www.scieco.co.th E-Mail : calibrate@scg.co.th

Certificate No. T250355

Page 2 of 6

Calibration Report

Equipment : HEATING BLOCK
Date of Calibration : 4 March 2025
Environment : Temperature : 24.4-24.9 °C
Line Voltage : 221.6-226.3 V
Relative Humidity : 55-65 %RH

Condition of this results of calibration :

1. This equipment was calibrated by insert nine standard thermocouples type T into its chamber , the other one standard thermocouples type T use for ambient temperature measurement . The calibration was done in according to WI-T20.

All data show below were final values and the initial data from customer request . The temperature scale used was based on ITS - 90 .

2. Reference Standard Instrument :

Instrument	Model	Instrument No.	Certificate No.	Due Date
TC	TYPE T	TN221-TN230	T240712	19 April 2025
TC	TYPE T	TN231-TN240	T240712	19 April 2025
TC	TYPE T	TN241-TN250	T240401	16 March 2025
TC	TYPE T	TN251-TN260	T240401	16 March 2025
DATA LOGGER	34970A	T193	T240401	16 March 2025

3. This certificate is traceable to :

National Institute of Metrology (Thailand) through Metrological Center (NSC-TISI-TIS 7025 CALIBRATION 0244)

4. Condition of calibrated item : good

Equipment Description :

Time Constant 2 Hour 40 Minute At 95 °C

Fresh Air Damper ☐ Open ☐ Min ☐ Medium ☐ Max

☐ Close
☒ Not Available

5. Adjustment :

() without adjustment

(X) after adjustment

Approved By.

FM-L13 108/30-05-57



Metrological Center

SCI ECO Services Company Limited

33/2 Moo 3, T.Banpa, A.Kaengkhoi, Saraburi 18110

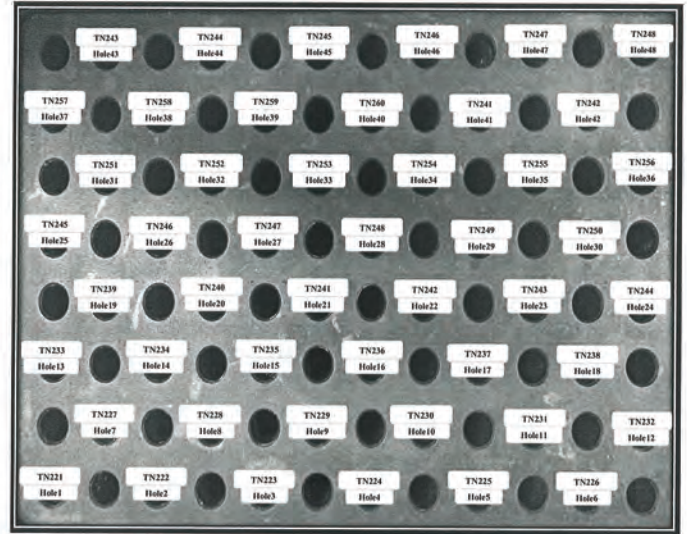
Telephone : +66 2 586 5792-4 Fax : +66 2 586 5109

Website : www.scieco.co.th E-Mail : calibrate@scg.co.th

Certificate No. T250355

Page 3 of 6

Calibration Report



FRONT CONTROL

Approved By.

FM-L13 108/30-05-57



Metrological Center

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Certificate No. T250355

Page 4 of 6

Calibration Report

Measurement Results

Calibration Point		Average Standard Reading at each position (°C)						
R1 Hole1-Hole6		TN221	TN222	TN223	TN224	TN225	TN226	
CAL POINT	Max	94.85	95.37	95.03	95.25	95.52	94.75	
	95	Min	94.17	94.66	94.38	94.63	94.87	94.12
	Average	94.51	95.02	94.70	94.94	95.20	94.43	
R2 Hole7-Hole12		TN227	TN228	TN229	TN230	TN231	TN232	
CAL POINT	Max	94.71	94.56	94.79	95.32	95.44	95.06	
	95	Min	94.05	93.88	94.10	94.65	94.90	94.63
	Average	94.38	94.22	94.44	94.99	95.17	94.85	
R3 Hole13-Hole18		TN233	TN234	TN235	TN236	TN237	TN238	
CAL POINT	Max	95.26	95.43	95.40	95.71	95.41	95.06	
	95	Min	94.54	94.64	94.71	95.10	94.86	94.42
	Average	94.90	95.03	95.06	95.41	95.13	94.74	
R4 Hole19-Hole24		TN239	TN240	TN241	TN242	TN243	TN244	
CAL POINT	Max	95.13	95.06	95.68	96.16	95.35	95.80	
	95	Min	94.39	94.43	94.86	95.51	94.88	95.12
	Average	94.76	94.75	95.27	95.83	95.12	95.46	
R5 Hole25-Hole30		TN245	TN246	TN247	TN248	TN249	TN250	
CAL POINT	Max	94.95	95.81	95.39	95.82	95.66	95.66	
	95	Min	94.47	95.03	94.67	94.99	94.84	94.87
	Average	94.71	95.42	95.03	95.41	95.25	95.27	
R6 Hole31-Hole36		TN251	TN252	TN253	TN254	TN255	TN256	
CAL POINT	Max	96.07	95.34	96.28	95.39	94.95	95.12	
	95	Min	95.28	94.55	95.51	94.62	94.13	94.35
	Average	95.67	94.95	95.90	95.00	94.54	94.73	
R7 Hole37-Hole42		TN257	TN258	TN259	TN260	TN241	TN242	
CAL POINT	Max	95.15	95.63	96.11	95.09	95.34	95.51	
	95	Min	94.38	94.88	95.32	94.28	94.54	94.72
	Average	94.76	95.25	95.71	94.69	94.94	95.11	
R8 Hole43-Hole48		TN243	TN244	TN245	TN246	TN247	TN248	
CAL POINT	Max	95.84	95.87	95.44	95.72	95.65	95.75	
	95	Min	95.06	95.10	94.60	94.95	94.87	94.98
	Average	95.45	95.48	95.02	95.34	95.26	95.36	

Approved By.

FM-L13 108/30-05-57



Metrological Center

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Certificate No. T250355

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Calibration Report

Measurement Results

Calibration Point		Average Standard Reading at each position (°C)					
R1 Hole1-Hole6		TN221	TN222	TN223	TN224	TN225	TN226
CAL POINT	Max	104.48	104.40	104.60	105.27	105.24	105.19
105	Min	104.15	104.02	104.25	104.94	104.91	104.93
	Average	104.32	104.21	104.42	105.10	105.08	105.06
R2 Hole7-Hole12		TN227	TN228	TN229	TN230	TN231	TN232
	Max	105.20	105.45	105.58	105.96	105.81	106.03
	Min	104.92	105.14	105.29	105.64	105.53	105.79
	Average	105.06	105.29	105.43	105.80	105.67	105.91
R3 Hole13-Hole18		TN233	TN234	TN235	TN236	TN237	TN238
	Max	106.09	106.14	105.83	106.25	105.97	105.88
	Min	105.80	105.89	105.57	106.00	105.69	105.63
	Average	105.94	106.01	105.70	106.13	105.83	105.77
R4 Hole19-Hole24		TN239	TN240	TN241	TN242	TN243	TN244
	Max	105.87	105.75	105.30	105.07	105.22	105.66
	Min	105.62	105.52	105.13	104.90	105.05	105.49
	Average	105.74	105.63	105.21	104.98	105.14	105.57
R5 Hole25-Hole30		TN245	TN246	TN247	TN248	TN249	TN250
	Max	105.62	105.54	105.52	105.75	105.97	105.69
	Min	105.45	105.35	105.31	105.57	105.81	105.49
	Average	105.53	105.44	105.41	105.66	105.89	105.59
R6 Hole31-Hole36		TN251	TN252	TN253	TN254	TN255	TN256
	Max	106.19	106.34	106.47	105.96	105.76	105.35
	Min	106.02	106.16	106.31	105.77	105.58	105.18
	Average	106.10	106.25	106.39	105.87	105.67	105.27
R7 Hole37-Hole42		TN257	TN258	TN259	TN260	TN241	TN242
	Max	106.21	105.59	105.45	105.36	106.08	106.09
	Min	106.04	105.42	105.28	105.20	105.90	105.92
	Average	106.12	105.51	105.37	105.28	105.99	106.00
R8 Hole43-Hole48		TN243	TN244	TN245	TN246	TN247	TN248
	Max	106.54	106.33	105.78	105.38	105.42	105.69
	Min	106.38	106.16	105.60	105.20	105.25	105.52
	Average	106.46	106.25	105.69	105.29	105.33	105.61

Approved By.

FM-L13 108/30-05-57



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Certificate No. T250355

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Calibration Report

Measurement Results:

HEATING BLOCK			Temperature Distribution	
Setting (°C)	Reading (°C)		Stability (± °C)	Uncertainty (± °C)
	Min, Max	Average		
102.0	-	102.0	0.43	0.83
107.0	-	107.0	0.20	0.70

* The quoted uncertainty exclude " uniformity "

The calibration result apply only the above calibrated item.

The result of test was found accurate as shown on date and place of test only.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k which for a t-distribution, providing a level of confidence of approximately 95 % .

Approved By: [Signature]

FM-L13 108/30-05-57



Metrology Center

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Certificate No. T250873

Certificate of Calibration

Page 1 of 4

Equipment : Chamber (Cooling Room)
Manufacturer : KOLDTECH
Model : KM 320
Serial No. : TBN-1012061/05
Customer Code : BKK_EN0167
ID No. : T2463A3
Customer : ALS Laboratory Group (Thailand) Co.,Ltd.
104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan,
Khet Suan Luang, Bangkok 10250
Customer Location : Laboratory Room
Date of Receipt : 28 May 2025
Calibrated By : Atiphong Rongrat (Technician)
Approved By : [Signature] / Boonchai Suriyawong (Site Calibration Manager)
Date of Issue : 19 JUN 2025

REVIEW BY [Signature]
APPROVED BY [Signature]
NEXT CAL DATE: 04/12/26

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

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

FM-TL06 102/27-03-68



Metrology Center

SCI ECO Services Company Limited

51 Moo 8, Tubkwang, Kaeng Khoi, Saraburi, Thailand 18260



Certificate No. T250873

Page 2 of 4

Calibration Report

Equipment : Chamber (Cooling Room)
Date of Calibration : 4 June 2025
Environment : Temperature : 23.4-24.9 °C
Line Voltage : 221.4-230.2 V
Relative Humidity : 55 - 65 %RH

Condition of this results of calibration :

- This equipment was calibrated by insert 16 standard thermocouples type T into its chamber , the other one standard thermocouples type T use for ambient temperature measurement . The calibration was done in according to WI-T20 (based on ASTM E145-94 (Reapproved 2001) and AS2853-1986).
All data show below were final values and the initial data from customer request . The temperature scale used was based on ITS - 90 .
- Reference Standard Instrument :

Instrument	Model	Instrument No.	Certificate No.	Due Date
TC	TYPE T	TN91-TN100	T242036	3 December 2025
TC	TYPE T	TN101-TN110	T242036	3 December 2025
DATA LOGGER	34970A	T121	T242036	3 December 2025
- This certificate is traceable to :
National Institute of Metrology (Thailand) through Metrological Center (NSC-TISI-TIS 17025 CALIBRATION 0244.3)
- Condition of calibrated item : good
Equipment Description :
Time Constant 2 Hour 20 Minute At 3 °C
Fresh Air Damper ☐ Open ☐ Min ☐ Medium ☐ Max
☐ Close
☒ Not Available
- Adjustment :
(X) without adjustment () after adjustment

Approved By: [Signature]

FM-TL07 102/27-03-68



Metrology Center

SCI ECO Services Company Limited

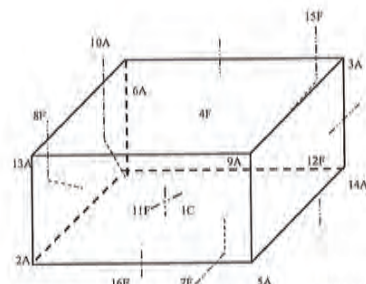
51 Moo 8, Tubkwang, Kaeng Khoi, Saraburi, Thailand 18260



Certificate No. T250873

Calibration Report

Page 3 of 4



C = Centre, F = Centre of Face, A = Corner, E = Centre of Edge

1C = TN91	12F = TN102
2A = TN92	13A = TN103
3A = TN93	14A = TN104
4F = TN94	15F = TN105
5A = TN95	16E = TN106
6A = TN96	
7F = TN97	
8F = TN98	
9A = TN99	
10A = TN100	
11F = TN101	

Approved By: [Signature]

FM-TL07 102/27-03-68

Overall GC Oven Temperature Stability Test Status

Pass

NOTE: This test's 1 comment(s) and 0 deviation(s) are available in the Attachments section.

Tune EI

Tested Combination1	Front	MMI	/ External	TQ
Name:	7000D			

Setpoint Status: Pass

Filament: 1

Setpoint Status: Pass

Filament: 2

Overall Tune EI Test Status

Pass

Scouting Run

Tested Combination1	Front	MMI	/ External	TQ
Name:	Injection Tower			
Source:	7693A			
	EI - Extractor			

Setpoint Status: Completed

Injection Volume on Column: 1.0 uL

Overall Scouting Run Status

Completed

Instrument Detection Limit

Tested Combination1	Front	MMI	/ External	TQ
Name:	Injection Tower			
Source:	7693A			
	EI - Extractor			

Setpoint Status: Completed

Injection Volume on Column: 1.0 uL

Overall Instrument Detection Limit Test Status

Pass

Mass Ratio Precision

Tested Combination1	Front	MMI	/ External	TQ
Name:	Injection Tower			
Source:	7693A			
	EI - Extractor			

Setpoint Status: Completed

Injection Volume on Column: 1.0 uL

Overall Mass Ratio Precision Test Status

Pass

Date: November 21, 2024 2:12:44 PM

System ID: GM-10

Setpoint Status:

Pass

Injection Volume on Column: 1.0 uL

Area: 4.58 %

Minimum RSD: 12.00 %

Agilent Recommended: 12.00 %

Status: Pass

Instrument Detection Limit: 1.54238 fg

Agilent Recommended: 4.03800 fg

Status: Pass

Overall Instrument Detection Limit Test Status

Pass

Mass Ratio Precision

Tested Combination1

Front

MMI

/ External

TQ

Injection Tower

Name: 7693A

Source: EI - Extractor

Setpoint Status: Pass

Injection Volume on Column: 0.5 uL

Area Mass 1

Abundance's

RSD: 2.23 %

Agilent Recommended: 5.00 %

Status: Pass

Overall Mass Ratio Precision Test Status

Pass

Date: November 21, 2024 2:12:44 PM

System ID: GM-10

Instrument Details

Purpose

This section describes the as found system configuration.

Details

System

System ID: GM-10

Manufacturer: Agilent Technologies

Name: 7890

Flow Data Input: Manual Data

Temperature Data Input: Manual Data or Other Data Logging

Tested Combination1

Injection Technique: Injection Tower

Inlet: Front

Detector: External

LTM Included?: No

Sampler 1

Manufacturer: Agilent Technologies

Type: Injection Tower

Name: 7693A

Model Number: G4513A

Serial Number: CN18180003

Firmware Revision: A.11.02

Usage: Sample Injection

Location: Front

Syringe Volume (uL): 10

Date: November 21, 2024 2:12:44 PM

System ID: GM-10

Sampler 2

Manufacturer: Agilent Technologies

Type: Tray

Name: 7693A

Model Number: G4514A

Serial Number: CN18170137

Firmware Revision: A.11.03

Visi Heater: Not installed

Mainframe 1

Manufacturer: Agilent Technologies

Name: 7890

Model Number: G3442B

Serial Number: CN18153080

Firmware Revision: B.02.05

Oven Type: Standard

Inlet 1

Manufacturer: Agilent Technologies

Name: 7890

Type: MMI

Location: Front

Carrier Gas: Helium

Control Type: Electronic Pressure Control (EPC)

Purged Inlet: Yes

Inlet 2

Manufacturer: Agilent Technologies

Name: 7890

Type: SSL

Location: Back

Carrier Gas: Helium

Control Type: Electronic Pressure Control (EPC)

Purged Inlet: Yes

Date: November 21, 2024 2:12:44 PM

System ID: GM-10

Detector 1	
Manufacturer	Agilent Technologies
Name	Mass Spectrometer
Type	Mass Spectrometer
Location	External
Mass Spectrometer 1	
Manufacturer	Agilent Technologies
Type	TQ
Name	7000D
Model Number	G7000D
Serial Number	US1826U108
Firmware Revision	G.7000.085A
High Vacuum System	Turbo Pump
Liquid Injection Scouting Run Standard	OFN Std
MS EI Source 1	
Manufacturer	Agilent Technologies
Source Type	EI - Extractor
Number of filaments	2

Date: November 21, 2024 2:12:44 PM
System ID: GM-10

Electronic Signature

Purpose

This signature page was created and published because the ACE sign-off action was executed, which is valid for the entire document, including attachments. The ACE sign-off is an electronic signature that requires two distinct identification components: unique username and personal password. The Agilent representative who has delivered this service understands the meaning and legal status of an electronic signature. As a trained official operator, the Agilent representative has a unique password and logon to access ACE and electronically sign this document. (Other e-signatures can be applied to this document using a Document Content Management or other suitable method defined in your data access and control procedures.)

Details

Full Name of Signer:	Supasak Nimsongtham
Logged On User Name:	supasak.nimsongtham@agilent.com
Signature Creation Date:	November 21, 2024
Reason for Signature:	Executed protocol and published this original version of document

ACE Self Qualification Status

The installed version of ACE used to deliver this service passed qualification; the results conform with expected values. The self qualification summary report is available in the session folder location SDS\ClearStore\AceSelfQualification.

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Date: November 21, 2024 2:12:44 PM
System ID: GM-10

User Name: supasak.nimsongtham
Report Generated by Hostname: SCG1115HKC
System ID: GM-10
Print Date: November 21, 2024 2:12:46 PM

GM-10 2024 Transaction log

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
November 21, 2024 11:58:17 AM	Audit	SessionCreated	Session	Host Name: SCG1115HKC, Drive Serial Number: C2031778
November 21, 2024 11:58:17 AM	Start	Configuration	Session	None
November 21, 2024 11:58:17 AM	Audit	Entitlement	Licensing	User is Field Engineer and does not require an unlock code
November 21, 2024 12:01:59 PM	Audit	EqpLoaded	Session	EQP details for primary technique [GC] - File path: [ProtocolPacks\GC\Configurations\02.56\GC.Ms.02.56.eqp], EQP File Name: [GC.02.55.eqp], EQP Name: [AgilentRecommended], Protocol Revision: [GC.02.55], EQP details for hyphenated technique [GCMS] - File path: [ProtocolPacks\GCMS\Configurations\02.56\GC.Ms.02.56.eqp], EQP File Name: [GC.Ms.02.55.eqp], EQP Name: [AgilentRecommended]
November 21, 2024 12:02:04 PM	End	Configuration	Session	None
November 21, 2024 12:02:12 PM	Start	Qualification	Session	OQ
November 21, 2024 12:02:12 PM	Start	Execution	CDS Logon Verification - GC - 7890 - Qualitative test	None
November 21, 2024 12:03:09 PM	End	Execution	CDS Logon Verification - GC - 7890 - Qualitative test	Run Count: 1

Date: November 21, 2024 2:12:44 PM
System ID: GM-10

User Name: supasak.nimsongtham
Report Generated by Hostname: SCG1115HKC
System ID: GM-10
Print Date: November 21, 2024 2:12:46 PM

GM-10 2024 Transaction log

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
November 21, 2024 12:03:11 PM	Start	Execution	System Inspection and Basic Safety and Operation - 7890 - Qualitative Test - No setpoints associated	None
November 21, 2024 12:03:20 PM	End	Execution	System Inspection and Basic Safety and Operation - 7890 - Qualitative Test - No setpoints associated	Run Count: 1
November 21, 2024 12:03:23 PM	Start	Execution	Inlet Pressure Accuracy - Front MM: - Pressure Controlled Inlet - S: 25.0 psi - L: <= 1.2 psi	None
November 21, 2024 12:03:25 PM	End	Execution	Inlet Pressure Accuracy - Front MM: - Pressure Controlled Inlet - S: 25.0 psi - L: <= 1.2 psi	Run Count: 1
November 21, 2024 12:03:30 PM	Start	Execution	GC Oven Temperature Accuracy - 7890 - Temperature Oven - S: 230.0°C - L: >= -1.0 AND <= 1.0 % setpoint in K	None
November 21, 2024 12:06:02 PM	Audit	Data	GC Oven Temperature Accuracy - 7890 - Temperature Oven - S: 230.0°C - L: >= -1.0 AND <= 1.0 % setpoint in K	Manual Data Entry
November 21, 2024 12:06:05 PM	End	Execution	GC Oven Temperature Accuracy - 7890 - Temperature Oven - S: 230.0°C - L: >= -1.0 AND <= 1.0 % setpoint in K	Run Count: 1
November 21, 2024 12:06:07 PM	Start	Execution	GC Oven Temperature Accuracy - 7890 - Temperature Oven - S: 100.0°C - L: >= -1.0 AND <= 1.0 % setpoint in K	None
November 21, 2024 12:06:20 PM	Audit	Data	GC Oven Temperature Accuracy - 7890 - Temperature Oven - S: 100.0°C - L: >= -1.0 AND <= 1.0 % setpoint in K	Manual Data Entry

Date: November 21, 2024 2:12:44 PM
System ID: GM-10

User Name: supasak.nimsongtham
Report Generated by Hostname: SCG1115HKC

System ID: GM-10
Print Date: November 21, 2024 2:12:46 PM

GM-10 2024 Transaction log:

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
November 21, 2024 12:05:33 PM	End	Execution	GC Oven Temperature Accuracy - 7890 - Temperature : Oven - S: 100.0°C - L: >= -1.0 AND <= 1.0 % setpoint in K	Run Count: 1
November 21, 2024 12:06:25 PM	start	Execution	GC Oven Temperature Stability - Nose - 7890 - Temperature : Oven - S: 100.0°C - L: <= 0.5°C	
November 21, 2024 12:07:10 PM	Audit	Data	GC Oven Temperature Stability - Manual Data Entry - 7890 - Temperature : Oven - S: 100.0°C - L: <= 0.5°C	
November 21, 2024 12:07:14 PM	End	Execution	GC Oven Temperature Stability - Run Count: 1 - 7890 - Temperature : Oven - S: 100.0°C - L: <= 0.5°C	
November 21, 2024 12:07:16 PM	start	Execution	Tune EI - 7000D TQ - Source: - None EI - Extractor Filament 1 (Qualitative - No setpoints associated)	
November 21, 2024 12:07:26 PM	End	Execution	Tune EI - 7000D TQ - Source: - Run Count: 1 EI - Extractor Filament 1 (Qualitative - No setpoints associated)	
November 21, 2024 12:07:28 PM	start	Execution	Tune EI - 7000D TQ - Source: - None EI - Extractor Filament 2 (Qualitative - No setpoints associated)	
November 21, 2024 12:07:39 PM	End	Execution	Tune EI - 7000D TQ - Source: - Run Count: 1 EI - Extractor Filament 2 (Qualitative - No setpoints associated)	
November 21, 2024 12:07:41 PM	start	Execution	Scouting Run - Injection Tower, Front MM, TQ - Source: - EI - Extractor - Part of GCMS System Preparation	

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Date: November 21, 2024 2:12:44 PM
System ID: GM-10

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User Name: supasak.nimsongtham
Report Generated by Hostname: SCG1115HKC

System ID: GM-10
Print Date: November 21, 2024 2:12:46 PM

GM-10 2024 Transaction log:

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
November 21, 2024 12:08:53 PM	Audit	Data	Scouting Run - Injection Tower, Front MM, TQ - Source: - EI - Extractor - Part of GCMS System Preparation	Data files Path: C:\GM-10\OQ2024\SC001.D
November 21, 2024 12:09:23 PM	Audit	Reporting	Reintegration	Reintegration Count: 1 - [Integration Type: Injection Baseline Correction Mode: Advanced Initial Slope Sensitivity: 10, Initial Peak Width: 0.01, Initial Area Reject: 0, Initial Height Reject: 50, Integration: On at 0, Integration: On at 4]
November 21, 2024 12:09:50 PM	End	Execution	Scouting Run - Injection Tower, Front MM, TQ - Source: - EI - Extractor - Part of GCMS System Preparation	Run Count: 1
November 21, 2024 12:09:53 PM	start	Execution	Instrument Detection Limit - Injection Tower, Front MM, TQ - Source: - EI - Extractor - RSD L (Area): <= 12.00% - RSD L (Ret. Time): <= 1.00%	
November 21, 2024 12:16:46 PM	Audit	Data	Instrument Detection Limit - Injection Tower, Front MM, TQ - Source: - EI - Extractor - RSD L (Area): <= 12.00% - RSD L (Ret. Time): <= 1.00%	Data files Path: C:\GM-10\OQ2024\IDL001.D
November 21, 2024 12:16:46 PM	Audit	Data	Instrument Detection Limit - Injection Tower, Front MM, TQ - Source: - EI - Extractor - RSD L (Area): <= 12.00% - RSD L (Ret. Time): <= 1.00%	Data files Path: C:\GM-10\OQ2024\IDL002.D

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Date: November 21, 2024 2:12:44 PM
System ID: GM-10

Page 12 / 15

User Name: supasak.nimsongtham
Report Generated by Hostname: SCG1115HKC

System ID: GM-10
Print Date: November 21, 2024 2:12:46 PM

GM-10 2024 Transaction log:

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
November 21, 2024 12:16:46 PM	Audit	Data	Instrument Detection Limit - Injection Tower, Front MM, TQ - Source: - EI - Extractor - RSD L (Area): <= 12.00% - RSD L (Ret. Time): <= 1.00%	Data files Path: C:\GM-10\OQ2024\IDL003.D
November 21, 2024 12:16:46 PM	Audit	Data	Instrument Detection Limit - Injection Tower, Front MM, TQ - Source: - EI - Extractor - RSD L (Area): <= 12.00% - RSD L (Ret. Time): <= 1.00%	Data files Path: C:\GM-10\OQ2024\IDL004.D
November 21, 2024 12:16:47 PM	Audit	Data	Instrument Detection Limit - Injection Tower, Front MM, TQ - Source: - EI - Extractor - RSD L (Area): <= 12.00% - RSD L (Ret. Time): <= 1.00%	Data files Path: C:\GM-10\OQ2024\IDL005.D
November 21, 2024 12:18:47 PM	Audit	Data	Instrument Detection Limit - Injection Tower, Front MM, TQ - Source: - EI - Extractor - RSD L (Area): <= 12.00% - RSD L (Ret. Time): <= 1.00%	Data files Path: C:\GM-10\OQ2024\IDL006.D
November 21, 2024 12:18:47 PM	Audit	Data	Instrument Detection Limit - Injection Tower, Front MM, TQ - Source: - EI - Extractor - RSD L (Area): <= 12.00% - RSD L (Ret. Time): <= 1.00%	Data files Path: C:\GM-10\OQ2024\IDL007.D
November 21, 2024 12:16:47 PM	Audit	Data	Instrument Detection Limit - Injection Tower, Front MM, TQ - Source: - EI - Extractor - RSD L (Area): <= 12.00% - RSD L (Ret. Time): <= 1.00%	Data files Path: C:\GM-10\OQ2024\IDL008.D
November 21, 2024 12:16:47 PM	Audit	Data	Instrument Detection Limit - Injection Tower, Front MM, TQ - Source: - EI - Extractor - RSD L (Area): <= 12.00% - RSD L (Ret. Time): <= 1.00%	Data files Path: C:\GM-10\OQ2024\IDL009.D

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Date: November 21, 2024 2:12:44 PM
System ID: GM-10

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User Name: supasak.nimsongtham
Report Generated by Hostname: SCG1115HKC

System ID: GM-10
Print Date: November 21, 2024 2:12:46 PM

GM-10 2024 Transaction log:

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
November 21, 2024 12:16:47 PM	Audit	Data	Instrument Detection Limit - Injection Tower, Front MM, TQ - Source: - EI - Extractor - RSD L (Area): <= 12.00% - RSD L (Ret. Time): <= 1.00%	Data files Path: C:\GM-10\OQ2024\IDL010.D
November 21, 2024 12:18:15 PM	Audit	Reporting	Reintegration	Reintegration Count: 1 - [Integration Type: Injection Baseline Correction Mode: Advanced Initial Slope Sensitivity: 10, Initial Peak Width: 0.01, Initial Area Reject: 0, Initial Height Reject: 50, Integration: Off at 0, Integration: On at 4]
November 21, 2024 12:22:43 PM	End	Execution	Instrument Detection Limit - Injection Tower, Front MM, TQ - Source: - EI - Extractor - RSD L (Area): <= 12.00% - RSD L (Ret. Time): <= 1.00%	Run Count: 1
November 21, 2024 12:22:52 PM	start	Execution	Mass Ratio Precision - Injection Tower, Front MM, TQ - Source: - EI - Extractor - L (RSD): <= 5.00%	
November 21, 2024 12:27:38 PM	Audit	Data	Mass Ratio Precision - Injection Tower, Front MM, TQ - Source: - EI - Extractor - L (RSD): <= 5.00%	Data files Path: C:\GM-10\OQ2024\MRP002.D
November 21, 2024 12:27:38 PM	Audit	Data	Mass Ratio Precision - Injection Tower, Front MM, TQ - Source: - EI - Extractor - L (RSD): <= 5.00%	Data files Path: C:\GM-10\OQ2024\MRP003.D
November 21, 2024 12:27:38 PM	Audit	Data	Mass Ratio Precision - Injection Tower, Front MM, TQ - Source: - EI - Extractor - L (RSD): <= 5.00%	Data files Path: C:\GM-10\OQ2024\MRP004.D

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Date: November 21, 2024 2:12:44 PM
System ID: GM-10

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User Name: supasak.kumprongkham
Report Generated by Hostname: SCG1115HRCSystem ID: GM-10
Print Date: November 21, 2024 2:12:46 PM

GM-10 2024 Transaction Log:

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
November 21, 2024 12:27:38 PM	Audit	Data	Mass Ratio Precision - Injection Tower, Front MMI, TQ - Source: EI - Extractor - L (RSD): <= 5.00%	Data File Path: C:\GM-10\OQ2024\MRP005.D
November 21, 2024 12:27:39 PM	Audit	Data	Mass Ratio Precision - Injection Tower, Front MMI, TQ - Source: EI - Extractor - L (RSD): <= 5.00%	Data File Path: C:\GM-10\OQ2024\MRP006.D
November 21, 2024 12:27:39 PM	Audit	Data	Mass Ratio Precision - Injection Tower, Front MMI, TQ - Source: EI - Extractor - L (RSD): <= 5.00%	Data File Path: C:\GM-10\OQ2024\MRP007.D
November 21, 2024 12:33:20 PM	Audit	Reporting	Reintegration	Reintegration Count: 1 - [Integration Type: Injection/Baseline Correction Mode: Advanced Initial Slope Sensitivity: 10 Initial Peak Width: 0.01 Initial Area Reject: 0 Initial Height Reject: 50000 Integration: Off at 0 Integration: On at 4]
November 21, 2024 12:36:42 PM	End	Execution	Mass Ratio Precision - Injection Tower, Front MMI, TQ - Source: EI - Extractor - L (RSD): <= 5.00%	Run Count: 1
November 21, 2024 12:37:11 PM	End	Qualification	Session	OQ
November 21, 2024 12:37:11 PM	Start	Reporting	Session	None
November 21, 2024 1:11:02 PM	Audit	Reporting	Session	Report Generated Certificate
November 21, 2024 1:37:20 PM	Audit	Reporting	Session	Report Generated : Report

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Date: November 21, 2024 2:12:46 PM
System ID: GM-10

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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL.0-2717-3000-29 FAX.0-2719-9484

Certificate of Calibration

Cert.No.: 25CHO537
Page.: 1 of 3

Equipment :

Spectrophotometer

Manufacturer :

HACH

Model :

DR3900

Serial No. :

2021559

ID No. :

BKK_EN0356

Condition As-Received:

Used Item

Received Date :

08 October 2025

Calibration Date :

08 October 2025

Reference :

2510-0042OC-11

Submitted by :

ALS Laboratory Group (Thailand) Co.,Ltd.
104 Phatthanakan 40, Phatthanakan Rd.,
Khwaeng Phatthanakan, Khet Suan Luang,
Bangkok 10250 Thailand

Calibration Place :

Wet Chemistry Lab 2

Ambient Temperature :

(21.9 to 21.9) °C (On-Site)

Relative Humidity :

(62 to 65) % (On-Site)

Calibration Procedure :

In - house method :
CP-0CH4 based on ASTM E 275-08

Calibrated by :

Uthen Kankawi

Approved by :

Approved Signatory

() Chakrit Waewwanjua

() Ponpan Paipim

(✓) Saithip Meangmai

Issue Date :

9 October 2025

The uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full, except with the prior written
Approval of the head of Corporate Services 3 : Equipment Calibration and Testing Services.Cert. No. : 25CHO537
Page : 2 of 3

Condition of calibration result

1. Reference Standard Material :

Material	Serial No.	Certificate No.	Due date
1. Absorbance Standard set	44487	122584	31 May 2026
2. Wavelength Standard set	36730	118120	15 Jan 2026
3. Wavelength Standard set	36730	118121	15 Jan 2026

2. This certificate is valid only to the item calibrated on date and place of calibration.
3. This certificate is traceable to the International System of Unit maintained through :
- Stama Scientific Ltd.

4. Spectral BandWidth : 5 nm
Scan Speed : - nm/min

Calibration Results : without adjustment

Wavelength Accuracy

Certified Values of Reference Material (nm)	UUC Reading (nm)	Uncertainty of Measurement (± nm)	Coverage Factor k
418.40	418	0.59	2.00
479.88	480	0.59	2.00
513.75	513	0.59	2.00
537.00	536	0.59	2.00
638.00	638	0.59	2.00
747.61	748	0.59	2.00
807.04	807	0.59	2.00

Cert. No. : 25CHO537
Page : 3 of 3

Calibration Results : without adjustment

Photometric Accuracy

Wavelength (nm)	Certified Values of Reference Material (Abs)	UUC Reading (Abs)	Uncertainty of Measurement (± Abs)	Coverage Factor k
420.0	Zero	0.000	0.0028	2.00
	0.5750	0.573	0.0028	2.00
	0.7156	0.713	0.0028	2.00
	1.0176	1.014	0.0028	2.00
440.0	Zero	0.000	0.0028	2.00
	0.5598	0.557	0.0028	2.00
	0.7037	0.700	0.0028	2.00
	1.0013	0.997	0.0028	2.00
465.0	Zero	0.000	0.0028	2.00
	0.5222	0.522	0.0028	2.00
	0.6646	0.664	0.0028	2.00
	0.9444	0.945	0.0028	2.00
546.1	Zero	0.000	0.0028	2.00
	0.5234	0.523	0.0028	2.00
	0.7007	0.700	0.0028	2.00
	0.9992	0.999	0.0028	2.00
590.0	Zero	0.000	0.0028	2.00
	0.5573	0.556	0.0028	2.00
	0.7760	0.773	0.0028	2.00
	1.1104	1.108	0.0028	2.00
635.0	Zero	0.000	0.0028	2.00
	0.5648	0.565	0.0028	2.00
	0.7654	0.765	0.0028	2.00
	1.0961	1.096	0.0028	2.00

Remark

- Each individual filter is measured against the empty filter holder (blank) used to zero the spectrophotometer
- UUC = Unit Under Calibration

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

Customer Contact:

ALS Laboratory Group (Thailand) Co
Ltd Head Office104 Phatthanakan 40 Phatthanakan Rd
Khwaeng Phatthanakan Khet Suan

TAX ID : 0105540004859

Chanattagarn.lmchom@alsglobal.com
27683058

Invoice To:

ALS Laboratory Group (Thailand) Co
Ltd Head Office104 Phatthanakan 40 Phatthanakan Rd
Khwaeng Phatthanakan Khet Suan

SERVICE REPORT

Customer Purchase Order Number:	Customer Number: 70371013
Service Request:	Service Request Date:
Service Order: 6007607368	Service Confirmation: 6906615981

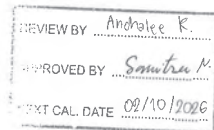
Direct Inquiries to:

Contact Name: Customer Contact Center
Contact E-mail: ccc-smt@agilent.com
Contact Telephone: +662 637 6363
Contact Fax: +662 632 4334

Delivery Site:

ALS Laboratory Group (Thailand) Co
Ltd Head Office104 Phatthanakan 40 Phatthanakan Rd
Khwaeng Phatthanakan Khet Suan

Location:

Room
Bldg
Lab
Dept

products | applications | software | services

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Bangkok 10500 Thailand
Tax ID : 010554268218Citibank N.A. Bangkok Branch
388 Interchange 21 Building, Sukhumvit Road, Klongtoey Nua
Sub-district, Wattana District, Bangkok 10110 Thailand
Acc. No: 012-4452-007
THB/Krung Thai Bank PCL
Siam Square Bldg. 416/1-2 Rama I Rd., Pathumwan, BKK 10330
Thailand

ORIGINAL

Service Instrument:

Model Number	Model Description	Serial Number	System Handle	Parent Asset
SYS-IM-7900	ICPMS 7900 System			
G8410A	SPS 4 Autosampler	AU15430722	ICP MS 7900	SYS-IM-7900
G8411A	ISIS 3 for Agilent 7850/7900/8900	JP15510227	ICP MS 7900	SYS-IM-7900
G3292A	PSC 6106T Chiller	2U15A1948	ICP MS 7900	SYS-IM-7900
G8403A	Agilent 7900 ICP-MS	JP15471169	ICP MS 7900	SYS-IM-7900

Service Items:

Item	Service / Part #	Description	Qty	Entitlement	Service Start	Service End
1000	EQO	Enterprise Operational Qualification	1.00	Agreement Entitlement 100 % covered	03.10.2025	03.10.2025
1010	5185-5850	ICP-MS Checkout Solutions	1.00	Agreement Entitlement 100 % covered		

Additional Information:

Service Confirmation Number: 6906615981

Service Confirmation Date: 03.10.2025

Service Information:

Problem Description:
*WU-EQO-IM-7900-5001413366

Service Provided:

Perform OQ hardware control. Test logon, tune, BG and stability.
Test OQ control of instrument ICPMS=BKK_EL0043
After done the instrument test all pass.

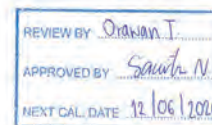
Service Overview Code:

Reason Code: Scheduled Service
Diagnosis Code: Scheduled Service
Resolution Code: Scheduled Service

Reported Hours: 5.0	Travel Hours: 1.5	
Customer Field Service Representative Name: Panthep Kurasethain	Customer Field Service Representative Signature:	Date: 03 Oct 2025
Customer Name: Anchalee Khamjan	Customer Signature:	Date: 03 Oct 2025

Additional Comments:

analytikjena



Maintenance Protocol

Atomic Fluorescence Spectrometer
mercur DUO /
mercur DUO plus

Serial-No.: K170A0143 Customer-No.: _____
Date: 12 December 2024 Carried out by: Srichai Fak-on

Maintenance with following Operational Qualification (OQ)
(requires a separate OQ protocol)

Company	บริษัท เอแอลเอส แลบบราทอรี กรุ๊ป (ประเทศไทย) จำกัด
User	
Department	ห้องแล็บปฏิบัติการ
Street	104 ซอย 40 ถนนพัฒนาการ แขวงสวนหลวง เขตสวนหลวง
Zip Code, City	กรุงเทพมหานคร 10250
Country	ประเทศไทย
Phone	
Fax	
E-mail	

Maintenance works basic unit

- lightness visual check inside the Mercur
- visual check if gold-traps are broken
- visual check if spectrometer is contaminated
- visual check of the fluorescence cell
- visual check of the absorption cell, incl. window
- reactor cleaning
- check pump-hose, if necessary change it
- check swivel drive (SEV)
- check drying-hose, output gas-liquid-separator
- test Bubble-Sensor
- check gas flows
- check volume flows, reagents
- recording stray light values
- measurement with 30 ng/l

Maintenance works Autosampler

Serial No.: 701 739

- lubricate the dosing-winding (Teflon-grease-spray)
- clean the dosing cylinder, if necessary exchange it
- lubricate the winding system of the height drive with some drops of oil
- check the toothed belt
- check the position of the mechanical stopper (height: 13mm)
- check the pump rate of mixing pump (<14s AS52, typ.7s/<20s AS52S, typ.10s)
- check the pump rate of washing cup.
- check the electrical hose connections for good contact
- check the connectors of the magnetic valves
- check the dosing hose for buckling, if necessary exchange it


Device parameter	nominal value	actual value
visual check general tightness inside the Mercur	<input type="checkbox"/> o.k.: <input type="checkbox"/>	<input type="checkbox"/> changed: <input type="checkbox"/>
visual check Goldtraps	<input type="checkbox"/> o.k.: <input type="checkbox"/>	<input type="checkbox"/> changed: <input type="checkbox"/>
visual check spectrometer		
Fluorescence cell	<input type="checkbox"/> o.k.: <input type="checkbox"/>	<input type="checkbox"/> changed: <input type="checkbox"/>
Absorption cell, incl. window	<input type="checkbox"/> o.k.: <input type="checkbox"/>	<input type="checkbox"/> changed: <input type="checkbox"/>
lens	<input type="checkbox"/> o.k.: <input type="checkbox"/>	<input type="checkbox"/> changed: <input type="checkbox"/>
Swivel drive (SEV)	<input type="checkbox"/> o.k.: <input type="checkbox"/>	<input type="checkbox"/> changed: <input type="checkbox"/>
check pump hoses	<input type="checkbox"/> o.k.: <input type="checkbox"/>	<input type="checkbox"/> changed: <input type="checkbox"/>
check hoses and hose connectors	<input type="checkbox"/> o.k.: <input type="checkbox"/>	<input type="checkbox"/> changed: <input type="checkbox"/>
check and clean reactor	<input type="checkbox"/> o.k.: <input type="checkbox"/>	<input type="checkbox"/> changed: <input type="checkbox"/>
check drying hose output Gas-liquid-separator	<input type="checkbox"/> o.k.: <input type="checkbox"/>	<input type="checkbox"/> changed: <input type="checkbox"/>
check bubble-sensor	<input type="checkbox"/> o.k.: <input type="checkbox"/>	<input type="checkbox"/> not o.k.: <input type="checkbox"/>
Check gasflow		
Argon pressure valve 4	1.2 – 1.5 bar	1.5 bar
Valve 1	10 Nl/h or 0.166 NL/min	0.142 NL/min
Valve 2	50 Nl/h or 0.833 NL/min	0.785 NL/min
Valve 3	5 Nl/h or 0.083 NL/min	0.080 NL/min
Valve 4	10 Nl/h or 0.166 NL/min	-
Check liquidflow		
Acid	2.5ml/min ± 1 ml	2.5 ml/min
Red.-agent	2.5ml/min ± 1 ml	2.5 ml/min
Sample	10ml/min ± 2 ml	10 ml/min
Adventitious light - values	(V)	from file
	100	0
	200	0
	300	0
	350	0
	400	1
	450	2
	500	6
	550	13
	575	18
	600	25
		0

Device parameter	nominal value	actual value
Analytical parameters Fluorescence cell		
Conditions.: max.conc.: 10µg/L PMT-voltage: .....360.....V		
Blank-solution		Int. 0.00044
without enrichment / FBR 30 ng/L	Int > 0.0015 RSD < 3 %	Int. 0.00237 RSD. 1.30 %
Conditions.: max.conc.: 1.7µg/L PMT-voltage: .....352.....V		
Blank-solution		Int. —
with enrichment / FBR 30 ng/L	Int > 0.008 RSD < 3 %	Int. — RSD. — %
Fok.- factor (Int ₂ / Int ₁)	> 3.5	—
Analytical parameters Absorption cell		
Blank-solution		Ext. 0.0011
without enrichment / FBR 100 ng/L	Ext. > 0.0012 RSD < 5 %	Ext. 0.0039 RSD. 2.99 %
Comments		
<ul style="list-style-type: none"> การใช้งานของ Tech: With enrichment ไม่สามารถวัดค่าได้เนื่องจาก Valve 4 (Gas flow) ไม่ทำงาน แต่ใช้แรมวัดค่าได้จาก Board control ย่านปกติ 24 Vdc. หากมีตัวย่นกที่ติดตั้งด้วย Tech: With enrichment ต้องซ่อมเปลี่ยนตัว Gas box 		

Signature Technician

12 December 2024

Place, Date (DD/MM/YYYY)


Signature Customer

12 December 2024

Place, Date (DD/MM/YYYY)

Service Report

Customer's address : บริษัท เอนดิช เจนา จำกัด (มหาชน) 40 หมู่ 5 ถนนสาย 845 ตำบลคลองหินปูน อำเภอปทุมธานี จังหวัดปทุมธานี 10250		Customer's Ref. No. Co.no. Service 2024	
E-mail : Phone : Fax :		<input checked="" type="checkbox"/> Analytik Jena Instruments (Thailand) Ltd. <input type="checkbox"/> Analytik Jena Far East (Thailand) Ltd.	
Job No. 2412571PB	User : Service Engineer : ศรัณย์ ชินธุ	Date : 12/12/2024	Page : 1/1
Instrument model : Mercury	Serial No. K170A0143	Software Version No. WinAAS 4.7.9.0	
<input type="checkbox"/> Repair (RE) <input checked="" type="checkbox"/> Maintenance (PM) <input type="checkbox"/> Installation (IN) <input type="checkbox"/> Warranty <input type="checkbox"/> Application (AP) <input type="checkbox"/> Site Prep. (SP) <input type="checkbox"/> Visit (VI)			
Fault / Claim : เครื่อง PM เครื่อง Mercury (Contact year 2025 / 1 Time) <input type="checkbox"/> Error Code			
Action taken : • Maintenance work basic unit • Check Device parameters • Check gas flow • Check liquid flow • Check Adventitious light- Valves • Test run Analytical parameter Fluorescence cell • Test run Analytical parameter Absorption cell			
Action Pending / Recommendation : • เครื่อง PM ไม่ทำงาน Tech. Without enrichment ใช้ Hg absorption • Hg low pressure lamp (Energy ค่าแรงดันไฟฟ้า PMT voltage 45) แรงดันไฟฟ้าต่ำ • แนะนำให้เปลี่ยน Hg low pressure lamp			
<input type="checkbox"/> Spare Part <input checked="" type="checkbox"/> Instrument Configuration :			
Item No.	Name	Quantity	Unit Price
1.	483-326	1	
2.	407-401-502	1	
3.			
4.			
5.			
6.			
7.			
8.			
Here with the undersigned confirm the time devoted, the work performed, the perfect function of the device, and the receipt/delivery of the specified spare parts. *Traveled hours and kilometers can only be entered after the return of the service engineer.		Date / Signature of Customer Oranwan T.	Date / Signature of Service Engineer ศรัณย์ ชินธุ
		Work completed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Services are subject to the General Terms and Conditions of Analytik Jena AG, which will be sent on request.

Mercur

Report file: C:\WinAAS\TMP\2024\DeclPro_008
Program version: 4.7.10.0 Printed on: 12/12/2024 11:37
Recording started on 12/12/2024 11:27 GMT+7.0
Operator: PSU.OTA
Laboratory: ALS-BKK
Code: IL_Hg067_2024
Remarks:
Food,water

Method parameters

Method Without enrichment / FBR 30ng/L_PM24052023
Created on 5/24/2023 Time 12:27
Program

Parameters Mercur Technique: Hg fluorescence

Line	253.7 nm		
Lamp type	Hg-LP		
Integr. mode	Peak height	Integr. time	30 s
PMT	360 V	Peak smoothing	12/11
AZ time	5 s		
Delay	0 s		
Working mode	w/o enrich.	System cleaning	Acid
FBR technique	on	Wash time acid	10 s
Pump speed	3	Soaking time	20 s
Sample load time	10 s	Gas load time	5 NL/h
Reaction time	10 s		
Waiting time AZ	5 s		
Delay	0 s		
Purge time1	28 s		
Purge time2	15 s	Gas wash time2	10 NL/h
Autosampler			
Autosampler	AS51S/F	Tray type	87/139
Working mode	continuous		

Dilution

Mercur

QC parameters

QC type	Conc. check	QC check samp. 2	
QC check samp. 1	---	Conc.	---
Conc.	---	Error limit	---
Error limit	---	Reaction	flag + continue
Rep. measurement	off	QC std. 2 no.	1(30,000 ng/L)
QC std. 1 no.	1(30,000 ng/L)	QC std. 2 limit	± 50.00%
QC std. 1 limit	± 50.00%	Reaction	flag + continue
QC std. act.	flag + continue	Reaction	off
Expect. blank abs.	0.0100± 0.0100	QC Recal. factor	Off
QC precision	off		

Calibration settings

Calib. meth	Standard calib.	Calibr. unit	ng/L
No. standards	1	Conversion fac.	1000000
Type of standards	---	Standard prep.	Premixed
		Blank correct.	---
Output unit	μg/L	Recalib. std. no.	---
Calib. stat.	Mean	Conversion fac.	1000
		Meas. cycles	3
Stock sol. 1	---	Blind cycles	1
Stock sol. 3	---	Stock sol. 2	---
Type of cal. curve	linear	Stock sol. 4	---
Weighted cal.	off	Intercept	calculated
Check of cal. curve	no outlier test	Grubbs stat.	off

Sample statistics

Stat. mode	Mean	Meas. cycles	2
Confd. level	95.4 %	Blind cycles	1
Grubbs stat.	---		

Calibration standards

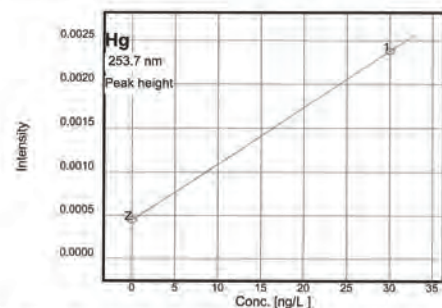
No.	Name	State	Pos	Conc./ng/L	Ints	SD	RSD/%
1	Cal-Zero	(-)	79	0.000	H: 0.000445 A: 0.009414	0.000017 0.000140	3.813 1.497
2	Cal-Std1	(-)	80	30.000	H: 0.002375 A: 0.03403	0.000031 0.000423	1.306 1.244

Hg

Calibration function : 1

12/12/2024 11:36 Calibration (Peak height)

Ints=k1+k2*conc
k1=0.000446 k2=0.000064 Recal. factor: ---
Slope 0.00006 Ints/(ng/L) R2-adjusted 1.0000
scd 1.000000 ng/L
Lower limit 0 ng/L Upper limit 33.0 ng/L
Detection limit --- Deter. limit ---



Measurements and events (sorted by time)

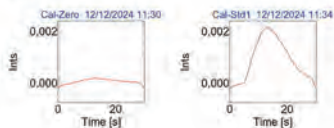
Hg	Without enrichment / FBR 30ng/L_PM 24052023	12/12/2024 11:28					
ID	Conc.	Ints	BG	SD	RSD/%	Int. type	Time
Cal-Zero		0.000436				PkH	11:30
		0.000436					11:31
		0.000465					11:32
	0ng/L	0.000445		0.000017000	3.813		11:32
Cal-Std1		0.002402				PkH	11:34
		0.002341					11:35
		0.002381					11:36
	30.00ng/L	0.002375		0.000031020	1.306		11:36
Calibration	Calibration function: 01						11:36

Mercur

Mercur

Peak plots

Hg



Mercur

Mercur

Report file: C:\WinAAS\TMPI\2024\DeclPro_010
 Program version: 4.7.10.0 Printed on: 12/12/2024 13:31
 Operator: PSUJ.OTA Recording started on: 12/12/2024 13:16 GMT+7.0
 Laboratory: ALS-BKK
 Code: IL_Hg067_2024
 Remarks:
 Food,water

Method parameters

Hg

Method Without enrichment / Abs / FBR 100ng/L PM 24052023
 Created on 12/12/2024 Time 12:42
 Program

Parameters Mercur Technique: Hg absorption

Line	253.7 nm		
Lamp type	Hg-LP		
Integr. mode	Peak height	Integr. time	55 s
PMT	225 V		
AZ time	5 s	Peak smoothing	8/5
Delay	8 s		
Working mode	w/o enrich.	System cleaning	Acid
FBR technique	on	Wash time acid	15 s
Pump speed	4	Soaking time	20 s
Sample load time	8 s	Gas load time	5 NL/h
Reaction time	12 s		
Waiting time AZ	15 s		
Delay	10 s		
Purge time1	50 s		
Purge time2	10 s	Gas wash time2	10 NL/h
Autosampler			
Autosampler	AS51S/F	Tray type	87/139
Working mode	continuous		

Dilution

Mercur

QC parameters

QC type	Conc. check	QC check samp. 2	---
QC check samp. 1	---	Conc.	---
Error limit	---	Error limit	---
Rep. measurement	off	Reaction	flag + continue
QC std. 1 no.	1(100.00 ng/L)	QC std. 2 no.	1(100.00 ng/L)
QC std. 1 limit	± 50.00%	QC std. 2 limit	± 0.00%
QC std. act.	flag + continue		
Expect. blank abs.	0.0100± 0.0100	Reaction	flag + continue
QC precision	off	Reaction	off
		QC Recal. factor	Off

Calibration settings

Calib. meth	Standard calib.	Calibr. unit	ng/L
No. standards	1	Conversion fac.	1000000
Type of standards	---	Standard prep.	Premixed
		Blank correct.	---
Output unit	μg/L	Recalib. std. no.	---
Calib. stat.	Mean	Conversion fac.	1000
		Meas. cycles	3
Stock sol. 1	---	Blind cycles	1
Stock sol. 3	---	Stock sol. 2	---
Type of cal. curve	linear	Stock sol. 4	---
Weighted cal.	off	Intercept	calculated
Check of cal. curve	no outlier test	Grubbs stat.	off

Sample statistics

Stat. mode	Mean	Meas. cycles	2
Confd. level	95.4 %	Blind cycles	1
Grubbs stat.	---		

Calibration standards

Hg

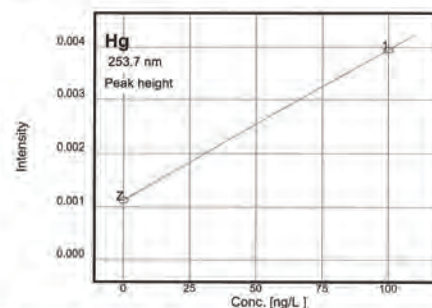
No.	Name	State	Pos.	Conc./ng/L	Abs	SD	RSD/%
1	Cal-Zero	(-)	79	0.00	H: 0.001129 A: 0.039764	0.000086 0.004386	7.666 11.03
2	Cal-Std1	(-)	81	100.00	H: 0.003950 A: 0.070560	0.000118 0.004290	2.993 6.081

Mercur

Calibration function 1

12/12/2024 13:31 Calibration (Peak height)

Abs=k1+k2*conc			
k1=0.001130	k2=0.000028	Recal. factor:	---
Slope	0.00003 Abs/(ng/L)	R2-adjusted	1.0000
sc0	1.00000 ng/L	Charact. conc.	154.568 (ng/L)/1%
Lower limit	0 ng/L	Upper limit	110. ng/L
Detection limit	---	Deter. limit	---



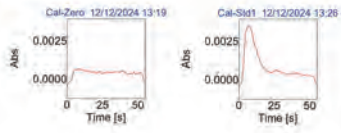
Measurements and events (sorted by time)

Hg	Without enrichment / Abs / FBR 100ng/L PM 24052023	12/12/2024 13:16
ID	Conc.	Abs BG SD RSD/% Int. type Time
Cal-Zero		0.001062 13:19
		0.001227 13:20
		0.001098 13:22
	0ng/L	0.001129 0.000086605 7.666 13:22
Cal-Std1		0.003949 13:26
		0.004069 13:27
		0.003832 13:29
	100.ng/L	0.003950 0.00011825 2.993 13:29
Calibration	Calibration function: 01	13:31

Mercur

Peak plots

Hg



Mercur

ภาคผนวก จ

สำเนาหนังสือใบอนุญาตขึ้นทะเบียน

ห้องปฏิบัติการวิเคราะห์เอกชน

ลำดับที่	สารเคมี	วิธีวิเคราะห์
19	Copper	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
20	Cyanide	Distillation, Colorimetric Method ⁽⁴⁾
21	2,4'-DDD	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
22	4,4'-DDD	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
23	2,4'-DDE	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
24	4,4'-DDE	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
25	2,4'-DDT	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
26	4,4'-DDT	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
27	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
28	Endosulfan Sulfate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
29	Endosulfan I	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
30	Endosulfan II	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
31	Endrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
32	Endrin Aldehyde	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
33	Formaldehyde	Distillation, Colorimetric Method ⁽³⁾
34	Free Chlorine	1) DPD Ferrous Titrimetric Method ⁽⁴⁾ 2) DPD Colorimetric Method ⁽⁴⁾
35	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
36	Heptachlor Epoxide	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
37	Hexavalent Chromium	Colorimetric Method ⁽⁴⁾
38	3-Hydroxycarbofuran	High-Performance Liquid Chromatographic Method ⁽⁴⁾
39	Lead	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾

40 Manganese...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
40	Manganese	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
41	Mercury	1) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
42	Methiocarb	High-Performance Liquid Chromatographic Method ⁽⁴⁾
43	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
44	Methomyl	High-Performance Liquid Chromatographic Method ⁽⁴⁾
45	Nickel	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
46	Oil & Grease	1) Liquid-Liquid, Partition-Gravimetric Method ⁽⁴⁾ 2) Soxhlet Extraction Method ⁽⁴⁾
47	Oxamyl	High-Performance Liquid Chromatographic Method ⁽⁴⁾
48	Propoxur	High-Performance Liquid Chromatographic Method ⁽⁴⁾
49	pH	Electrometric Method ⁽⁴⁾
50	Phenols	1) Distillation, Chloroform Extraction Method ⁽⁴⁾ 2) Distillation, Direct Photometric Method ⁽⁴⁾
51	Selenium	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
52	Sulfide	Iodometric Method ⁽⁴⁾
53	Temperature	Laboratory and Field Method ⁽⁴⁾
54	Total Dissolved Solids	Dried at 180 °C ⁽⁴⁾
55	Total Kjeldahl Nitrogen	Semi-Micro Kjeldahl Method ⁽⁴⁾
56	Total Phosphorous	Digestion, Colorimetric Method ⁽⁴⁾
57	Total Suspended Solids	Dried from 103-105 °C ⁽⁴⁾
58	Toxaphene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
59	Trivalent Chromium	1) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Colorimetric Method; Calculation ⁽⁴⁾
60	Zinc	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁴⁾

น้ำดื่ม...

น้ำดื่ม จำนวน 126 รายการ

ลำดับที่	สารเคมี	วิธีวิเคราะห์
1	Acenaphthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
2	Acetone	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
3	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
4	Anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
5	Antimony	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
6	Arsenic	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
7	Atrazine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
8	Barium	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
9	Benz(a)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
10	Benzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
11	Benzo(b)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
12	Benzo(k)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
13	Benzoic Acid	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
14	Benzo(a)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
15	Benzo(g,h,i)perylene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
16	Beryllium	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
17	Bis(2-chloroethyl)ether	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾

18 Bis(2-ethoxyethyl)phthalate...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
18	Bis(2-ethoxyethyl)phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
20	Bromoform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
21	Butanol	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
22	Butyl benzyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
23	Cadmium	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
24	Carbazole	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
25	Carbon disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
27	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
28	p-Chloroaniline	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
32	2-Chlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
33	Chromium	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
34	Chromium (III)	1) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Colorimetric Method; Calculation ⁽⁴⁾
35	Chromium (VI)	Colorimetric Method ⁽⁴⁾

36 Chrysene...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
36	Chrysene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
37	Cyanide	Distillation, Colorimetric Method ⁽⁴⁾
38	2,4-D	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
39	DDD	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
40	DDE	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
41	DDT	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
42	Dibenz(a,h)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
43	Di-n-Butyl Phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
44	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
47	3,3-Dichlorobenzidine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
48	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
49	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
50	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
53	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾

56 1,3-Dichloropropene...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
57	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
58	Diethyl Phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
59	2,4-Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
60	2,4-Dinitrophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
61	2,4-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
62	2,6-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
63	Di-n-octyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
64	Endosulfan	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
65	Endrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
66	Ethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
67	Fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
68	Fluorene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
69	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
70	Heptachlor epoxide	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
71	Hexachlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
73	n-Hexane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
74	α-HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
75	β-HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾

76 γ-HCH...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
76	γ-HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
77	Hexachlorocyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
78	Hexachloroethane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
79	Indeno(1,2,3-cd)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
80	Isophorone	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
81	Lead	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
82	Manganese	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
83	Mercury	1) Digestion, Cold Vapor Atomic Absorption Spectrometric Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
84	Methanol	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
85	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
86	Methyl bromide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
87	Methylene chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
88	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
89	2-Methylnaphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
90	Methyl tert-butyl Ether	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
91	Naphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
92	Nickel	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
93	Nitrobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾

94 N-Nitrosodiphenylamine...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
94	N-Nitrosodiphenylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
95	N-Nitrosodi-n-Propylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
96	Polychlorinated Biphenyls - PCB 1016 - PCB 1221 - PCB 1232 - PCB 1242 - PCB 1248 - PCB 1254 - PCB 1260	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
97	Pentachlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
98	pH	Electrometric Method ⁽⁴⁾
99	Phenanthrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
100	Phenol	1) Distillation, Chloroform Extraction Method ⁽⁴⁾ 2) Distillation, Direct Photometric Method ⁽⁴⁾ 3) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
101	Pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
102	Selenium	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
103	Silver	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
104	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
105	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
106	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
107	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
108	Toxaphene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
109	TPH (C ₉ -C ₉)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁾⁽²⁾⁽³⁾

110 TPH (C₁₀-C₁₆)...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
110	TPH (C ₈ -C ₁₆)	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(8,22)
111	TPH (C ₁₆ -C ₃₅)	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(8,22)
112	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
113	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
114	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
115	Trichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
116	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
117	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
118	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
119	Vanadium	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁴⁾
120	Vinyl acetate	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
121	Vinyl chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
122	m-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
123	o-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
124	p-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
125	Xylene (Total)	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
126	Zinc	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁴⁾

อากาศเสีย...

อากาศเสีย (ปล่อยระบาย) จำนวน 28 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Antimony	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
2	Arsenic	2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾ 1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
3	Beryllium	2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾ 1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
4	Cadmium	2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾ 1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
5	Carbon Monoxide	1) Instrumental Analyzer Method ⁽⁵⁾
6	Chlorine	2) Sampling Bag Non-Dispersive Infrared Method ⁽⁵⁾
7	Chromium	1) Absorption Sampling, Ion Chromatographic Method ⁽⁵⁾ 2) Isokinetic Sampling, Ion Chromatographic Method ⁽⁵⁾
8	Cobalt	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾
9	Copper	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾
10	Cresol	Adsorption Sampling, Gas Chromatographic Method ⁽⁵⁾
11	Dioxins	Isokinetic Sampling ⁽⁵⁾
12	Hydrogen Chloride	1) Absorption Sampling, Ion Chromatographic Method ⁽⁵⁾ 2) Isokinetic Sampling, Ion Chromatographic Method ⁽⁵⁾
13	Hydrogen Fluoride	1) Absorption Sampling, Ion Chromatographic Method ⁽⁵⁾ 2) Isokinetic Sampling, Ion Chromatographic Method ⁽⁵⁾
14	Hydrogen Sulfide	Absorption Sampling, Iodometric Method ⁽⁵⁾

15 Lead...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
15	Lead	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾
16	Manganese	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾
17	Mercury	1) Isokinetic Sampling, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ⁽⁵⁾
18	Nickel	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾
19	Opacity	Ringelmann's Method ⁽²⁾
20	Oxides of Nitrogen	1) Absorption Sampling, Phenoldisulfonic Acid Method ⁽⁵⁾ 2) Absorption Sampling, Alkaline Permanganate/Colorimetric Method ⁽⁵⁾ 3) Instrumental Analyzer Method ⁽⁵⁾
21	Selenium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾
22	Sulfur Dioxide	1) Absorption Sampling, Barium-Thorin Titrimetric Method ⁽⁵⁾ 2) Instrumental Analyzer Method ⁽⁵⁾
23	Sulfuric Acid	Isokinetic Sampling, Barium-Thorin Titrimetric Method ⁽⁵⁾
24	Tellurium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾
25	Tin	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾
26	Total Suspended Particulate	1) Isokinetic Sampling, Gravimetric Method ⁽⁵⁾ 2) Paired Train, Isokinetic Sampling, Gravimetric Method ⁽⁵⁾

27 Vanadium...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
27	Vanadium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁵⁾
28	Xylene	Adsorption Sampling, Gas Chromatographic Method ⁽⁵⁾

สิ่งปนเปื้อนหรือวัสดุที่ไม่ใช่แก๊ส จำนวน 35 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,2,26) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,26)
2	Antimony	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,6,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,16) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
3	Arsenic	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,6,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,16) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
4	Barium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,6,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,16) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)

5 Beryllium...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
5	Beryllium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6,17) 3) Digestion, Inductively Coupled Plasma Method ^(7.14) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7.17)
6	Cadmium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6,17) 3) Digestion, Inductively Coupled Plasma Method ^(7.14) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7.17)
7	Chlordane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9,26) 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
8	Chromium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6,17) 3) Digestion, Inductively Coupled Plasma Method ^(7.14) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7.17)
9	Chromium (III)	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction, Colorimetric Method; Calculation Method ^(1.6,16,19) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Waste Extraction, Colorimetric Method; Calculation Method ^(1.6,17,19) 3) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(7.18,19) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(7.18,17,19)

10 Chromium (VI)...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
10	Chromium (VI)	1) Waste Extraction, Colorimetric Method ^(1.6,19) 2) Alkaline Digestion, Colorimetric Method ^(8,19)
11	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6,17) 3) Digestion, Inductively Coupled Plasma Method ^(7.14) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7.17)
12	Copper	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6,17) 3) Digestion, Inductively Coupled Plasma Method ^(7.14) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7.17)
13	2,4-D	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9,26) 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
14	DDD	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9,26) 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
15	DDE	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9,26) 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
16	DOT	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9,26)

2) Soxhlet...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
17	Dieldrin	2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26) 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9,26) 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
18	Endrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9,26) 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
19	Heptachlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9,26) 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
20	Lead	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6,17) 3) Digestion, Inductively Coupled Plasma Method ^(7.14) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7.17)
21	Lindane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9,26) 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)

22 Mercury...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
22	Mercury	1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^(1.6,20) 2) Waste Extraction, Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ^(1.6,30) 3) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽²⁰⁾ 4) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ⁽²⁰⁾ 5) Thermal Decomposition Amalgamation and Atomic Absorption Spectrometric Method ⁽²¹⁾
23	Methoxychlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9,26) 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
24	Mirex	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9,26) 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
25	Molybdenum	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6,17) 3) Digestion, Inductively Coupled Plasma Method ^(7.14) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7.17)
26	Nickel	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6,17) 3) Digestion, Inductively Coupled Plasma Method ^(7.14) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7.17)
27	Polychlorinated biphenyls (PCBs) - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9,26) 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)

- 2-Chlorobiphenyl...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
28	- 2-Chlorobiphenyl - 2,3-Dichlorobiphenyl - 2,2',5'-Trichlorobiphenyl - 2,4',5'-Trichlorobiphenyl - 2,2',3,5'-Tetrachlorobiphenyl - 2,2',5,5'-Tetrachlorobiphenyl - 2,3',4,4'-Tetrachlorobiphenyl - 2,2',3,4,5'-Pentachlorobiphenyl - 2,2',4,5,5'-Pentachlorobiphenyl - 2,3,3',4',6-Pentachlorobiphenyl - 2,2',3,4,4',5'-Hexachlorobiphenyl - 2,2',3,4,5,5'-Hexachlorobiphenyl - 2,2',3,5,5',6-Hexachlorobiphenyl - 2,2',4,4',5,5'-Hexachlorobiphenyl - 2,2',3,3',4,4',5'-Heptachlorobiphenyl - 2,2',3,4,4',5,5'-Heptachlorobiphenyl - 2,2',3,4,4',5',6-Heptachlorobiphenyl - 2,2',3,4',5,5',6-Heptachlorobiphenyl - 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl Pentachlorophenol	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9,28) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26) Electrometric Method ^(23,24) 1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.4,14) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,14) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
29	pH	
30	Selenium	

31 Silver...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
31	Silver	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,14) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
32	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.4,14) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,14) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
33	Toxaphene	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9,24) 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)
34	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6,16) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,14) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
35	Zinc	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.4,14) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6,17) 3) Digestion, Inductively Coupled Plasma Method ^(7,14) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)

ดิน...

ดิน จำนวน 125 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)
2	Acetone	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(15,23) 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ⁽¹³⁾
3	Aldrin	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)
4	Anthracene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)
5	Antimony	1) Digestion, Inductively Coupled Plasma Method ^(7,14) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
6	Arsenic	1) Digestion, Inductively Coupled Plasma Method ^(7,14) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
7	Atrazine	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)
8	Barium	1) Digestion, Inductively Coupled Plasma Method ^(7,14) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
9	Benz(a)anthracene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)
10	Benzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(15,23)

11 Benzo(b)fluoranthene

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
11	Benzo(b)fluoranthene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)
12	Benzo(k)fluoranthene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)
13	Benzoic acid	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)
14	Benzo(a)pyrene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)
15	Benzo(g,h,i)perylene	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)
16	Beryllium	1) Digestion, Inductively Coupled Plasma Method ^(7,14) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,17)
17	Bis(2-chloroethyl)ether	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)
18	Bis(2-ethylhexyl)phthalate	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(15,23)
20	Bromoform	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(15,23)
21	Butanol	Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(13,23)
22	Butyl Benzyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(11,26)

23 Cadmium...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
23	Cadmium	1) Digestion, Inductively Coupled Plasma Method ^(7,14) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(1,17)
24	Carbazole	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
25	Carbon Disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
27	Chlordane	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
28	p-Chloroaniline	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
32	2-Chlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
33	Chromium	1) Digestion, Inductively Coupled Plasma Method ^(7,14) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(1,17)
34	Chromium (III)	1) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method, Calculation Method ^(7,8,14,19) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(7,8,17,19)
35	Chromium (VI)	Alkaline Digestion, Colorimetric Method ^(8,19)

36 Chrysene...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
36	Chrysene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
37	Cyanide	Extraction, Distillation, Colorimetric Method ^(27,28,29)
38	2,4-D	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
39	DDD	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
40	DDE	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
41	DDT	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
42	Dibenz(a,h)anthracene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
43	Di-n-Butyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
44	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
47	3,3-Dichlorobenzidine	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
48	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)

49 1,2-Dichloroethane...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
49	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
50	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
53	2,4-Dichlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
57	Dieldrin	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
58	Diethyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
59	2,4-Dimethylphenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
60	2,4-Dinitrophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
61	2,4-Dinitrotoluene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
62	2,6-Dinitrotoluene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)

63 Di-n-Octyl Phthalate...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
63	Di-n-Octyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
64	Endosulfan	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
65	Endrin	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
66	Ethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
67	Fluoranthene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
68	Fluorene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
69	Heptachlor	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
70	Heptachlor epoxide	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
71	Hexachlorobenzene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25)
73	n-Hexane	1) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,25) 2) Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method ⁽¹⁵⁾

73 n-Hexane...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
74	α -HCH	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
75	β -HCH	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
76	γ -HCH	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
77	Hexachlorocyclopentadiene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
78	Hexachloroethane	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
79	Indeno(1,2,3-cd)pyrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
80	Isophorone	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
81	Lead	1) Digestion, Inductively Coupled Plasma Method ^(7,16) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)
82	Manganese	1) Digestion, Inductively Coupled Plasma Method ^(7,16) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)
83	Mercury	1) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽²⁰⁾ 2) Thermal Decomposition, Amalgamation, and Atomic Absorption Spectrophotometry ⁽²¹⁾ 3) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ⁽¹⁹⁾

84 Methanol...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
84	Methanol	1) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,25) 2) Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method ^(13,25)
85	Methoxychlor	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
86	Methyl Bromide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,25)
87	Methylene Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,25)
88	2-methylphenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
89	2-Methylnaphthalene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
90	Methyl tert-Butyl Ether	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,25)
91	Naphthalene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
92	Nickel	1) Digestion, Inductively Coupled Plasma Method ^(7,16) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)
93	Nitrobenzene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
94	N-Nitrosodiphenylamine	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
95	N-Nitrosodi-n-propylamine	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)

96 Polychlorinated biphenyls (PCBs)

ลำดับที่	สารเคมี	วิธีวิเคราะห์
96	Polychlorinated biphenyls (PCBs) - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260 - 2-Chlorobiphenyl - 2,2',3,5'-Tetrachlorobiphenyl - 2,2',5,5'-Tetrachlorobiphenyl - 2,3',4,4'-Tetrachlorobiphenyl - 2,2',3,4,5'-Pentachlorobiphenyl - 2,2',4,5,5'-Pentachlorobiphenyl - 2,3',3',4,6-Pentachlorobiphenyl - 2,2',3,4,4',5'-Hexachlorobiphenyl - 2,2',3,4,5,5'-Hexachlorobiphenyl - 2,2',3,5,5',6'-Hexachlorobiphenyl - 2,2',4,4',5,5'-Hexachlorobiphenyl - 2,2',3,3',4,4',5'-Heptachlorobiphenyl - 2,2',3,4,4',5,5'-Heptachlorobiphenyl - 2,2',3,4,4',5,6'-Heptachlorobiphenyl - 2,2',3,4',5,5',6'-Heptachlorobiphenyl - 2,2',3,3',4,4',5,5',6'-Nonachlorobiphenyl Pentachlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
97	Phenanthrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)

99 Phenol...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
99	Phenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
100	Pyrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
101	Selenium	1) Digestion, Inductively Coupled Plasma Method ^(7,16) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)
102	Silver	1) Digestion, Inductively Coupled Plasma Method ^(7,16) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)
103	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,25)
104	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,25)
105	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,25)
106	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,25)
107	Toxaphene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
108	TPH (C ₉ -C ₆)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,25)
109	TPH (C ₉ -C ₁₀)	1) Automated Extraction, Gas Chromatographic Method ^(12,22) 2) Solvent Extraction, Gas Chromatographic Method ^(12,23) 3) Ultrasonic Extraction, Gas Chromatographic Method ^(12,23)
110	TPH (C ₉ -C ₁₆)	1) Automated Extraction, Gas Chromatographic Method ^(12,22) 2) Solvent Extraction, Gas Chromatographic Method ^(12,23) 3) Ultrasonic Extraction, Gas Chromatographic Method ^(12,23)
111	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,25)
112	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,25)
113	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,25)
114	Trichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(13,25)

115 2,4,5-Trichlorophenol...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
115	2,4,5-Trichlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
116	2,4,6-Trichlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(10,26) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(11,26)
117	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,23)
118	Vanadium	1) Digestion, Inductively Coupled Plasma Method ^(7,14) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)
119	Vinyl Acetate	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,23)
120	Vinyl Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,23)
121	m-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,23)
122	o-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,23)
123	p-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,23)
124	Xylene (Total)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(15,23)
125	Zinc	1) Digestion, Inductively Coupled Plasma Method ^(7,14) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,17)

เอกสารอ้างอิง

- กระทรวงอุตสาหกรรม, ประกาศกระทรวงอุตสาหกรรม, พ.ศ. 2566, เรื่อง การจัดการสิ่งปฏิกูลหรือวัสดุที่ไม่ได้เอื้อ, ราชกิจจานุเบกษา, 31 พฤษภาคม 2566, เล่มที่ 140 ตอนพิเศษ 126 ง.
- กระทรวงอุตสาหกรรม, ประกาศกระทรวงอุตสาหกรรม, พ.ศ. 2549, เรื่อง กำหนดค่าปริมาณแอมโมเนียที่เจือปนในอากาศที่ระบายออกจากปล่องของหม้อน้ำโรงงานที่เขมกลบเป็นเชื้อเพลิง, ราชกิจจานุเบกษา, 4 ธันวาคม 2549, เล่มที่ 123 ตอนพิเศษ 125 ง.
- สมาคมวิศวกรรมสิ่งแวดล้อมแห่งประเทศไทย, คู่มือวิเคราะห์น้ำเสีย, พิมพ์ครั้งที่ 4, กรุงเทพฯ: เรือนแก้วการพิมพ์, 2547.
- APHA, AWWA, WEF, Standard Methods for the Examination of Water and Wastewater, 24th ed. Washington, DC: APHA, 2023.


5. United States...

- United States Environmental Protection Agency, Standards of Performance for New Stationary Sources, 40 CFR 60, Appendix A, 2023.
- United States Environmental Protection Agency, Test Methods for Evaluating Solid Waste Physical/Chemical Methods, SW-846, 2014.
- United States Environmental Protection Agency, Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Acid Digestion of Sludges and Sediments and Soils, SW-846 Method 3050B, 1996.
- United States Environmental Protection Agency, Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Alkaline Digestion for Hexavalent Chromium, SW-846 Method 3060A, 1996.
- United States Environmental Protection Agency, Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Separatory Funnel Liquid-Liquid Extraction, SW-846 Method 3510C, 1996.
- United States Environmental Protection Agency, Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Soxhlet Extraction, SW-846 Method 3540C, 1996.
- United States Environmental Protection Agency, Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Automated Soxhlet Extraction, SW-846 Method 3541, 1994.
- United States Environmental Protection Agency, Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Microscale Solvent Extraction (MSE), SW-846 Method 3570, 2002.
- United States Environmental Protection Agency, Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Volatile Organic Compounds (VOCs) in Various Sample Matrices Using Equilibrium Headspace Analysis, SW-846 Method 5021A, 2014.
- United States Environmental Protection Agency, Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Purge-and-Trap for Aqueous Samples, SW-846 Method 5030B, 1996.
- United States Environmental Protection Agency, Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Closed-System Purge-and-Trap and Extraction for Volatile Organics in Soil and Waste Samples, SW-846 Method 5035, 1996.
- United States Environmental Protection Agency, Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Inductively Coupled Plasma-Atomic Emission Spectrometry, SW-846 Method 6010B, 1996.
- United States Environmental Protection Agency, Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Inductively Coupled Plasma-Mass Spectrometry, SW-846 Method 6020A, 2007.
- United States Environmental Protection Agency, Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Antimony and Arsenic (Atomic Absorption, Borohydride Reduction), SW-846 Method 7062, 1994, เพิ่มใหม่
- United States Environmental Protection Agency, Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Chromium, Hexavalent (Colorimetric), SW-846 Method 7196A, 1992.

20. United States...

- United States Environmental Protection Agency, Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Mercury in Solid or Semisolid Waste (Manual Cold-Vapor Technique), SW-846 Method 7471B, 2007.
- United States Environmental Protection Agency, Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Mercury in Solids and Solutions by Thermal Decomposition, Amalgamation, and Atomic Absorption Spectrophotometry, SW-846 Method 7473, 2007.
- United States Environmental Protection Agency, Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Nonhalogenated Organics by Gas Chromatography, SW-846 Method 8015C, 2007.
- United States Environmental Protection Agency, Test Methods for Evaluating Solid Waste Physical/Chemical Methods, pH Electrometric Measurement, SW-846 Method 9040C, 2004.
- United States Environmental Protection Agency, Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Soil and Waste pH, SW-846 Method 9045D, 2004.
- United States Environmental Protection Agency, Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS), SW-846 Method 8260D, 2018.
- United States Environmental Protection Agency, Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS), SW-846 Method 8270E, 2018.
- United States Environmental Protection Agency, Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Total and Amenable Cyanide: Distillation SW-846 Method 9010B, 1996.
- United States Environmental Protection Agency, Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Cyanide Extraction Procedure for Solids and Oil, SW-846 Method 9013A, 1996.
- United States Environmental Protection Agency, Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Cyanide in Waters and Extracts Using Titrimetric and Manual Spectrophotometric Procedures, SW-846 Method 9014, 2014.
- United States Environmental Protection Agency, Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Mercury in Sediment and Tissue Samples by Atomic Fluorescence Spectrometry, SW-846 Method 7474, 2007.
- United States Environmental Protection Agency, Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Ultrasonic Extraction, SW-846 Method 3550C, 2007.

วิมล


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 ถนนพหลโยธิน แขวงพญาไท เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๒๕ มิถุนายน ๒๕๖๑

เรื่อง เปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์
 (เรียน กรรมการผู้จัดการ บริษัท เอสแอล แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด
 คำสั่ง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และขอคืนสถานะห้องปฏิบัติการวิเคราะห์ตาม
 ลงวันที่ ๒๔ มีนาคม ๒๕๖๑)

ตามคำสั่งที่อ้างถึง บริษัท เอสแอล แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ขอแจ้งการ
 วัตถุประสงค์ของเอกสารเปลี่ยนแปลงบุคลากร และขอคืนสถานะห้องปฏิบัติการวิเคราะห์ตาม
 เลขที่ ๒๕ มิถุนายน ๒๕๖๑

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้

๑. นายสมชาย ใจดี	ทะเบียนเลขที่ ๖-๒๐๑๔-๖-๐๐๒๕
๒. นายสมชาย ใจดี	ทะเบียนเลขที่ ๖-๒๐๑๔-๖-๐๐๒๕
๓. นายสมชาย ใจดี	ทะเบียนเลขที่ ๖-๒๐๑๔-๖-๐๐๒๕
๔. นายสมชาย ใจดี	ทะเบียนเลขที่ ๖-๒๐๑๔-๖-๐๐๒๕
๕. นายสมชาย ใจดี	ทะเบียนเลขที่ ๖-๒๐๑๔-๖-๐๐๒๕
๖. นายสมชาย ใจดี	ทะเบียนเลขที่ ๖-๒๐๑๔-๖-๐๐๒๕
๗. นายสมชาย ใจดี	ทะเบียนเลขที่ ๖-๒๐๑๔-๖-๐๐๒๕
๘. นายสมชาย ใจดี	ทะเบียนเลขที่ ๖-๒๐๑๔-๖-๐๐๒๕
๙. นายสมชาย ใจดี	ทะเบียนเลขที่ ๖-๒๐๑๔-๖-๐๐๒๕
๑๐. นายสมชาย ใจดี	ทะเบียนเลขที่ ๖-๒๐๑๔-๖-๐๐๒๕
๑๑. นายสมชาย ใจดี	ทะเบียนเลขที่ ๖-๒๐๑๔-๖-๐๐๒๕
๑๒. นายสมชาย ใจดี	ทะเบียนเลขที่ ๖-๒๐๑๔-๖-๐๐๒๕
๑๓. นายสมชาย ใจดี	ทะเบียนเลขที่ ๖-๒๐๑๔-๖-๐๐๒๕
๑๔. นายสมชาย ใจดี	ทะเบียนเลขที่ ๖-๒๐๑๔-๖-๐๐๒๕

วันที่ ๒๕ มิถุนายน ๒๕๖๑

ฉบับนี้ หนังสือฉบับนี้ จะเสนอคำขอพร้อมหนังสือต่ออายุไว้กับทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
ในวันที่ ๒ กันยายน ๒๕๖๔

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายพรบศ กลิ่นทอง)
รองอธิบดี ปฏิบัติราชการแทน
อธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน
กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ
โทร. ๐ ๒๕๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕
โทรสาร ๐ ๒๕๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕
ไปรษณีย์อิเล็กทรอนิกส์ sarabang@diw.mail.go.th



อุตสาหกรรมกว่า ๑๐๐ ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว



ที่ อก ๐๓๑๐(๑)/ ๑๒๓๖ ๘ ๑



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๑๘ ธันวาคม ๒๕๖๓

เรื่อง ยกเลิกบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และขอปิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๒ ธันวาคม ๒๕๖๓

ตามคำขอที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการ
วิเคราะห์เอกชน เลขทะเบียน ๖-๒๐๔๔ สถานที่ตั้งเลขที่ ๑๐๔ ซอยพัฒนาการ ๔๐ ถนนพัฒนาการ แขวงพัฒนาการ
เขตสวนหลวง กรุงเทพมหานคร ขอยกเลิกบุคลากร ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้ยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์
จำนวน ๘ ราย ได้แก่

- | | |
|--------------------------------|-----------------------------|
| ๑) นายประพนธ์ วรรณชัย | ทะเบียนเลขที่ ๖-๒๐๔๔-๑-๐๐๖๐ |
| ๒) นายจิรพันธุ์ ขาวละออ | ทะเบียนเลขที่ ๖-๒๐๔๔-๑-๐๐๗๒ |
| ๓) นายพิรพัฒน์ กำคำ | ทะเบียนเลขที่ ๖-๒๐๔๔-๑-๐๐๘๘ |
| ๔) นางสาวอรสา ศักดิ์ทอง | ทะเบียนเลขที่ ๖-๒๐๔๔-๑-๐๑๓๔ |
| ๕) นายกิตติพงศ์ แซ่ลี | ทะเบียนเลขที่ ๖-๒๐๔๔-๑-๐๑๓๔ |
| ๖) นายจิรเมธ ประเสริฐศิริพิงค์ | ทะเบียนเลขที่ ๖-๒๐๔๔-๑-๐๑๖๐ |
| ๗) นายไพโรจน์ มณฑาทอง | ทะเบียนเลขที่ ๖-๒๐๔๔-๑-๐๑๖๗ |
| ๘) นางสาวจารุวรรณ กระจำพันธ์ | ทะเบียนเลขที่ ๖-๒๐๔๔-๑-๐๑๘๑ |

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายธีรทัศน์ อิศรางกูร ณ อยุธยา)
รองอธิบดี ปฏิบัติราชการแทน
อธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๕๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๕๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕

ไปรษณีย์อิเล็กทรอนิกส์ sarabang@diw.mail.go.th



อุตสาหกรรมกว่า ๑๐๐ ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว



ที่ อก ๐๓๑๐(๑)/ ๑๒ ๑๔ ๐



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๑๐ เมษายน ๒๕๖๔

เรื่อง ยกเลิกบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และขอปิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๒ เมษายน ๒๕๖๔

ตามคำขอที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการ
วิเคราะห์เอกชน เลขทะเบียน ๖-๒๐๔๔ สถานที่ตั้งเลขที่ ๑๐๔ ซอยพัฒนาการ ๔๐ ถนนพัฒนาการ แขวงพัฒนาการ
เขตสวนหลวง กรุงเทพมหานคร ขอยกเลิกบุคลากร ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้ยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์
จำนวน ๒ ราย ได้แก่

- | | |
|------------------------|-----------------------------|
| ๑) นายอิทธิศักดิ์ วัณน | ทะเบียนเลขที่ ๖-๒๐๔๔-๑-๐๑๑๒ |
| ๒) นายเมฆกล ผลาทิพย์ | ทะเบียนเลขที่ ๖-๒๐๔๔-๑-๐๑๑๐ |

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายธีรทัศน์ อิศรางกูร ณ อยุธยา)
รองอธิบดี ปฏิบัติราชการแทน
อธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๕๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๕๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕

ไปรษณีย์อิเล็กทรอนิกส์ sarabang@diw.mail.go.th



อุตสาหกรรมกว่า ๑๐๐ ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว



ที่ อก ๐๓๑๐(๑)/ ๑๒ ๑๔ ๐



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๐๕ มิถุนายน ๒๕๖๔

เรื่อง เปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และขอปิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๗ พฤษภาคม ๒๕๖๔

ตามคำขอที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการ
วิเคราะห์เอกชน เลขทะเบียน ๖-๒๐๔๔ สถานที่ตั้งเลขที่ ๑๐๔ ซอยพัฒนาการ ๔๐ ถนนพัฒนาการ แขวงพัฒนาการ
เขตสวนหลวง กรุงเทพมหานคร ขอเปลี่ยนแปลงบุคลากร ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้เพิ่มเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน
จำนวน ๑๑ ราย ได้แก่

- | | |
|-----------------------------------|-----------------------------|
| ๑) นายคุณากร มั่นชื่น | ทะเบียนเลขที่ ๖-๒๐๔๔-๑-๐๑๓๔ |
| ๒) นายชัยมงคล แสนมาตร | ทะเบียนเลขที่ ๖-๒๐๔๔-๑-๐๑๓๕ |
| ๓) นายเอกรินทร์ บุตรคำทิ | ทะเบียนเลขที่ ๖-๒๐๔๔-๑-๐๑๓๖ |
| ๔) นายพิชานนท์ อินธิกร | ทะเบียนเลขที่ ๖-๒๐๔๔-๑-๐๑๓๗ |
| ๕) นายศตวรรษ แก้วโนนา | ทะเบียนเลขที่ ๖-๒๐๔๔-๑-๐๑๓๘ |
| ๖) นายวิกรม มิตธี | ทะเบียนเลขที่ ๖-๒๐๔๔-๑-๐๑๓๙ |
| ๗) นายกนกวัน คำจันทร์ | ทะเบียนเลขที่ ๖-๒๐๔๔-๑-๐๑๔๐ |
| ๘) นายศุภวิทย์ มีพัชร | ทะเบียนเลขที่ ๖-๒๐๔๔-๑-๐๑๔๑ |
| ๙) นายธีรพงษ์ ศรีคำแหง | ทะเบียนเลขที่ ๖-๒๐๔๔-๑-๐๑๔๒ |
| ๑๐) นายอภิสิทธิ์ ศรีคนแก้ว | ทะเบียนเลขที่ ๖-๒๐๔๔-๑-๐๑๔๓ |
| ๑๑) ว่าที่ร้อยตรี ภาณุพงศ์ แสนศรี | ทะเบียนเลขที่ ๖-๒๐๔๔-๑-๐๑๔๔ |

อนึ่ง หนังสือฉบับนี้ จะเสนอคำขอพร้อมหนังสือต่ออายุไว้กับทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
ในวันที่ ๒ กันยายน ๒๕๖๔

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายธีรทัศน์ อิศรางกูร ณ อยุธยา)
รองอธิบดี ปฏิบัติราชการแทน
อธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๕๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๕๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕

ไปรษณีย์อิเล็กทรอนิกส์ sarabang@diw.mail.go.th



อุตสาหกรรมกว่า ๑๐๐ ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว



ที่ อก ๐๓๔๐(๑)/ ๒๕ ๐ ๕



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๒๑ สิงหาคม ๒๕๖๔

เรื่อง: เปลี่ยนแปลงสารมลพิษที่วิเคราะห์

เรียน: กรรมการผู้จัดการ บริษัท เอแอลเอส แลบริทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง: คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงผลการ และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๒๗ มิถุนายน ๒๕๖๔

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือเปลี่ยนแปลงสารมลพิษที่วิเคราะห์

บริษัท เอแอลเอส แลบริทอรี กรุ๊ป (ประเทศไทย) จำกัด จำนวน ๖ หน้า

ตามคำขอที่อ้างถึง บริษัท เอแอลเอส แลบริทอรี กรุ๊ป (ประเทศไทย) จำกัด ต้องปฏิบัติตาม
วิเคราะห์เอกชน เลขทะเบียน ๖-๒๐๔ สถานที่ตั้งเลขที่ ๑๐๔ ซอยพัฒนาการ ๔๐ ถนนพัฒนาการ แขวงพัฒนาการ
เขตสวนหลวง กรุงเทพมหานคร ขอเปลี่ยนแปลงสารมลพิษที่วิเคราะห์ ที่ต้องวิเคราะห์จากสารมลพิษ นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ได้รับบริษัท เอแอลเอส แลบริทอรี กรุ๊ป (ประเทศไทย) จำกัด
เพิ่มขอบข่ายชนิดสารมลพิษที่วิเคราะห์ในใบได้ติด สิ่งปลูกและวัสดุที่ไม่ใช้แล้ว และคืน สารสิ่งที่ส่งมาด้วย

อนึ่ง หนังสือฉบับนี้จะสิ้นสุดอายุพร้อมหนังสือต่ออายุรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
ในวันที่ ๒ กันยายน ๒๕๖๔

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นางสาวปัทมวรรณ คุณประเสริฐ)
ผู้อำนวยการกองนโยบายและแผนสิ่งแวดล้อม
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร: ๐ ๒๕๖๐ ๖๓๓๐๒ ต่อ ๒๑๐๓-๕

โทรสาร: ๐ ๒๕๖๐ ๖๓๓๐๒ ต่อ ๒๑๖๔๔

ไปรษณีย์อิเล็กทรอนิกส์: sarabang@gv.w.mil.go.th



"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"



เอกสารแนบท้ายหนังสือเปลี่ยนแปลงสารมลพิษที่วิเคราะห์

บริษัท เอแอลเอส แลบริทอรี กรุ๊ป (ประเทศไทย) จำกัด

เลขทะเบียน ๖-๒๐๔

ที่ อก ๐๓๔๐(๑)/ ๒๕ ๐ ๕

ลงวันที่ ๒๑ สิงหาคม ๒๕๖๔

ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๔๐ รายการ

นำติดต้น จำนวน ๔ รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aluminum	Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(1,3,6)
2	Copper	Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽²⁾
3	Iron	Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽²⁾
4	Molybdenum	Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽²⁾

สิ่งปลูกและวัสดุที่ไม่ใช้แล้ว จำนวน 17 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Antimony	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,6) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)
2	Arsenic	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,6) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)
3	Barium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,6) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)

Beryllium

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
4	Beryllium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,6) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)
5	Cadmium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,6) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)
6	Chromium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,6) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)
7	Chromium (III)	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction, Colorimetric Method; Calculation Method ^(1,3,6,8) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Waste Extraction, Colorimetric Method; Calculation Method ^(1,3,7,8) 3) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(4,5,6,8) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(4,5,7,8)
8	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,6) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7)

3) Digestion...

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
9	Copper	3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7) 1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,6) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)
10	Lead	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,6) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)
11	Molybdenum	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,6) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)
12	Nickel	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,6) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)
13	Selenium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,6) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(4,6) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(4,7)

14 Silver...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
14	Silver	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,4) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(3,5,7) 3) Digestion, Inductively Coupled Plasma Method ^(8,9) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
15	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,4) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(8,9) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
16	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,4) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(8,9) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
17	Zinc	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,3,4) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,3,7) 3) Digestion, Inductively Coupled Plasma Method ^(8,9) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)

ดิน จำนวน 19 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aluminium	1) Digestion, Inductively Coupled Plasma Method ^(8,9) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
2	Antimony	1) Digestion, Inductively Coupled Plasma Method ^(8,9) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)

3 Arsenic...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
3	Arsenic	1) Digestion, Inductively Coupled Plasma Method ^(8,9) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
4	Barium	1) Digestion, Inductively Coupled Plasma Method ^(8,9) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
5	Beryllium	1) Digestion, Inductively Coupled Plasma Method ^(8,9) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
6	Cadmium	1) Digestion, Inductively Coupled Plasma Method ^(8,9) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
7	Chromium	1) Digestion, Inductively Coupled Plasma Method ^(8,9) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
8	Chromium (III)	1) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(4,5,6,8) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(4,5,7,8)
9	Copper	1) Digestion, Inductively Coupled Plasma Method ^(8,9) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
10	Iron	1) Digestion, Inductively Coupled Plasma Method ^(8,9) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
11	Lead	1) Digestion, Inductively Coupled Plasma Method ^(8,9) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
12	Manganese	1) Digestion, Inductively Coupled Plasma Method ^(8,9) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
13	Molybdenum	1) Digestion, Inductively Coupled Plasma Method ^(8,9) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
14	Nickel	1) Digestion, Inductively Coupled Plasma Method ^(8,9) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)

15 pH...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
15	pH	Electrometric Method ⁽⁹⁾
16	Selenium	1) Digestion, Inductively Coupled Plasma Method ^(8,9) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
17	Silver	1) Digestion, Inductively Coupled Plasma Method ^(8,9) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
18	Vanadium	1) Digestion, Inductively Coupled Plasma Method ^(8,9) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)
19	Zinc	1) Digestion, Inductively Coupled Plasma Method ^(8,9) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(4,7)

เอกสารอ้างอิง

- กระทรวงอุตสาหกรรม. ประกาศกระทรวงอุตสาหกรรม, พ.ศ. 2566. เรื่อง การจัดการสิ่งปฏิกูลหรือวัสดุที่ไม่ได้เจือ. ราชกิจจานุเบกษา. 31 พฤษภาคม 2566. เล่มที่ 140 ตอนพิเศษ 126 ง.
- APHA, AWWA, WEF. Standard Methods for the Examination of Water and Wastewater. 24th ed. Washington, DC: APHA, 2023.
- United States Environmental Protection Agency. Test Methods for Evaluating Solid Waste Physical/Chemical Methods. SW-846.
- United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Acid Digestion of Sediments, Sludges, and Soils. SW-846 Method 3050B, 1996.
- United States Environmental Protection Agency. Test Methods for Evaluating Solid Waste Physical/Chemical Methods. Alkaline Digestion for Hexavalent Chromium. SW-846 Method 3060A, 1996.
- United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Inductively Coupled Plasma-Optical Emission Spectrometry. SW-846 Method 6010D, 2018.
- United States Environmental Protection Agency. Test Methods for Evaluating Solid Waste Physical/Chemical Methods. Inductively Coupled Plasma-Mass Spectrometry. SW-846 Method 6020B, 2014.
- United States Environmental Protection Agency. Test Methods for Evaluating Solid Waste Physical/Chemical Methods. Chromium, Hexavalent (Colorimetric). SW-846 Method 7196A, 1992.
- United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Soil and Waste pH. SW-846 Method 9045D, 2004.

๓๗



ที่ อก ๐๗๓๐(๓)๕๐ ๑ ๑๑

กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๖๐๐๐

๒๖ กันยายน ๒๕๖๕

เรื่อง เปลี่ยนแปลงบุคลากร ชื่อตัวและชื่อสกุลของบุคลากร

เรียน กรรมการผู้จัดการ บริษัท เอเอสแอล แลบริเอทอรี่ กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และขอสมัครสมาชิกของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๒๓ สิงหาคม ๒๕๖๕

ตามคำขอที่อ้างถึง บริษัท เอเอสแอล แลบริเอทอรี่ กรุ๊ป (ประเทศไทย) จำกัดขอปฏิบัติ
วิเคราะห์เอกชน เลขทะเบียน ๖-๒๐๔ สถานที่ ตั้งเลขที่ ๓๐๔ ซอยพัฒนาการ ๔๐ ถนนพัฒนาการ
แขวงพัฒนาการ เขตสวนหลวง กรุงเทพมหานคร ขอเปลี่ยนแปลงบุคลากร ชื่อตัวและชื่อสกุลของบุคลากร
ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้

๑. ให้อยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๒ ราย

๑) นางสาวพาดิ์ คุณนาม ทะเบียนเลขที่ ๖-๒๐๔-๖-๐๑๓๓๑

๒) นางสาวอนิศา เทียนคำ ทะเบียนเลขที่ ๖-๒๐๔-๖-๐๑๓๓๔

๒. ให้เปลี่ยนชื่อตัวและชื่อสกุลของเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จากเดิม
นายอาทิตย์ ศรีเสน เป็น นายรัฐธีร์ ทวีกิจวรรณ ทะเบียนเลขที่ ๖-๒๐๔-๖-๐๑๓๔๕

อนึ่ง หนังสือฉบับนี้จะสิ้นสุดพร้อมหนังสือต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
ในวันที่ ๒ กันยายน ๒๕๖๕

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

๒

(นางสาวปัทมวรรณ คุณประเสริฐ)

ผู้อำนวยการกองวิเคราะห์และประเมินผลพิษวิทยา

ปฎิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและพัฒนาระบบพิษวิทยา

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๕๓๐ ๖๓๓๒ ถึง ๒๕๓๐๓-๕

โทรสาร ๐ ๒๕๓๐ ๖๓๓๒ ถึง ๒๕๓๐๔

ไปรษณีย์อิเล็กทรอนิกส์ sarabang@dlw.mail.go.th



"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"





๐๔ สิงหาคม ๒๕๖๓

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบริทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน ลงวันที่ ๒๗ พฤษภาคม ๒๕๖๓

สิ่งที่ส่งมาด้วย เอกสารแบบท้ายหนังสือต่ออายุรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอแอลเอส แลบริทอรี กรุ๊ป (ประเทศไทย) จำกัด จำนวน ๓ แผ่น

ตามคำขอที่อ้างถึง บริษัท เอแอลเอส แลบริทอรี กรุ๊ป (ประเทศไทย) จำกัด ขอต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๓๒๓ สถานที่ตั้งเลขที่ ๖๑๖/๑๐ หมู่ที่ ๕ ตำบลแม่ไร่ อำเภอลำปาง จังหวัดลำปาง ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอแอลเอส แลบริทอรี กรุ๊ป (ประเทศไทย) จำกัด ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมห้องปฏิบัติการวิเคราะห์เอกชน

- | | |
|-------------------------|----------------------------|
| ๑) นายเดช ช้างชน | ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๐๑ |
| ๒) นางสาววันดี บริรักษ์ | ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๐๒ |
| ๓) นายสุพจน์ สยามะ | ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๐๓ |

ข. เจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน

- | | |
|------------------------------|----------------------------|
| ๑) นายณัฐพงษ์ เพ็งขาว | ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๐๑ |
| ๒) นางสาวกัญญารัตน์ รักดี | ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๐๒ |
| ๓) นางสาวจุฑารัตน์ สีทองหลาง | ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๐๓ |
| ๔) นางสาวจิตติมา ประเทืองสุข | ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๐๔ |
| ๕) นายสรวิศ คุ้มภัย | ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๐๕ |
| ๖) นายณัฐพล ออพนพรพร | ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๐๖ |
| ๗) นายจิตรกร สีระสา | ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๐๗ |
| ๘) นายสุพจน์ สุวรรณรัตน์ | ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๐๘ |
| ๙) นายสิทธิพันธ์ แสนทวี | ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๐๙ |
| ๑๐) นายอนุวัฒน์ โคมมา | ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๑๐ |
| ๑๑) นายสุวิทย์ นราพงษ์ | ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๑๑ |
| ๑๒) นายณัฐพล เจริญวิเศษ | ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๑๒ |
| ๑๓) นายชานนท์ บุญชื่น | ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๑๓ |
| ๑๔) นายณัฐกร วงศ์อินทร์ | ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๑๔ |
| ๑๕) นายอานนท์ โพธิ์พระทอง | ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๑๕ |

๑๖) นายณัฐพล...

- ๑๖) นายณัฐพล ถักกลาง
๑๗) นายศุภณัฐ พิเศษพันธ์
๑๘) นายสันติ คินันติ
๑๙) นายวิญญู ฉิมพาลี
๒๐) นายศุภณัฐ สกุลกิตติศักดิ์
๒๑) นายเอกชัย กันทอง
๒๒) นายพงษ์เทพ สิทธิเสาะ
๒๓) นายทินกร กุณาณี
๒๔) นางสาวนันทิยา บุญจันทร์
๒๕) นายสิทธิชัย อันพินาย
๒๖) นางสาวปภาณิน พลอดทอง
๒๗) นางสาวพจนนา สีตา
๒๘) นางสาววันฉัตร สันติวงศ์
๒๙) นายพิทยา พงษ์แดง
๓๐) นางสาวชัชชญา สุขเกษ
๓๑) ว่าที่ร้อยตรี รณชัย ม่วงมา
๓๒) นายวรวิทย์ พันพา
๓๓) นายศักดิ์วันพร จรัสกาย
๓๔) นายสุรศักดิ์ สาชิน
๓๕) นายสถาพร ภาแก้ว
๓๖) นายสุทธิดำรง โชติพัฒน์
๓๗) นายวิมล หันไชยเนาว์
๓๘) นางสาววันฉัตร เจริญตระกูล
๓๙) นายอนุชิต วงศ์ไชย
๔๐) นายชัยยุทธ เลิศนันทกุลชัย
๔๑) นายสุจิตา เพ็ชรแสง
๔๒) นายกิตติคุณ มณีสัมพันธ์
๔๓) นายธีรวัฒน์ อธิจินดา
๔๔) นายศุภชัย วงศ์สุริยา
๔๕) นายไสร ต้นโพธิ์
๔๖) นางสาวกิตติยา สันญาภิรักษ์
๔๗) นางสาวจิตติมา สิริมงคล
๔๘) นายพิพัฒน์ นิกิตร์เศรษฐ์
๔๙) นายศิริวิทย์ เรืองสม
๕๐) นายปารเมศ สัตยาคุณ
๕๑) นายณพนา ธรรมะโร
๕๒) นางสาวศุภรัตน์ โลจันทร

- ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๑๖
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ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๔๒
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ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๕๒
ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๕๓

๕๓) นายพรหม...

- ๕๒) นายพรหม เจริญชัย
๕๓) นายพิทักษ์ เสือมาก
๕๔) นายอนุวัช ทองขจรศักดิ์
๕๕) นายอภิชาติ วิลาศ
๕๖) นายจรัสศรี ศรีวิภา
๕๗) นายประสาธิต เรืองเพชร
๕๘) นายภาณุวัฒน์ วิ่งบง
๖๐) นายสันติ ชัยชนะ
๖๑) นายทินกร กุศลศิริ
๖๒) นายทินกร กุศลศิริ

- ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๕๔
ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๕๕
ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๕๖
ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๕๗
ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๕๘
ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๕๙
ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๖๐
ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๖๑
ทะเบียนเลขที่ ๖-๓๒๓-๖-๐๐๖๒

ค. ขอบข่ายชนิดสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย น้ำใต้ดิน อากาศเสียตามสิ่งที่ส่งมาด้วย

หนังสือฉบับนี้จะหมดอายุในวันที่ ๒๘ มิถุนายน ๒๕๖๓ หากประสงค์จะต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อกรมโรงงานอุตสาหกรรมภายใน ๖๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายพรยศ กลิ่นทอง)
รองอธิบดี ปฏิบัติราชการแทน
อธิบดีกรมโรงงานอุตสาหกรรม



เอกสารแบบท้ายหนังสือเปลี่ยนแปลงสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เอแอลเอส แลบริทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ๖-๓๒๓
ที่ อก ๐๓๒๐/ ๗ ๕๓ ๘ ลงวันที่ ๐๔ สิงหาคม ๒๕๖๓

ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๒๔ รายการ
น้ำเสีย จำนวน 14 รายการ

ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
1	Biochemical Oxygen Demand	1) 5-Day BOD Test, Membrane Electrode Method ^[2]
2	Chemical Oxygen Demand	1) 5-Day BOD Test, Azide Modification Method ^[2] 1) Open Reflux, Titrimetric Method ^[2] 2) Closed Reflux, Colorimetric Method ^[2] 3) Closed Reflux, Titrimetric Method ^[2]
3	Color	ADMI Weighted-Ordinate Spectrophotometric Method ^[2]
4	Cyanide	Distillation, Colorimetric Method ^[2]
5	Formaldehyde	Distillation, Colorimetric Method ^[1]
6	Free Chlorine	DPD Ferrous Titrimetric Method ^[2]
7	Oil and Grease	Liquid-Liquid, Partition-Gravimetric Method ^[2]
8	pH	Electrometric Method ^[2]
9	Phenols	1) Distillation, Chloroform Extraction Method ^[2] 2) Distillation, Direct Photometric Method ^[2]
10	Sulfide	ZnS Precipitation, Iodometric Method ^[2]
11	Temperature	Field Method ^[2]
12	Total Dissolved Solids	Dried at 180 °C ^[2]
13	Total Kjeldahl Nitrogen	Semi-Macro Kjeldahl Method ^[2]
14	Total Suspended Solids	Dried at 103-105 °C ^[2]

น้ำใต้ดิน จำนวน 3 รายการ

ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
1	Cyanide	Distillation, Colorimetric Method ^[2]
2	pH	Electrometric Method ^[2]
3	Phenols	Distillation, Direct Photometric Method ^[2]

อากาศเสีย...

อากาศเสีย (ปล่อยระบาย) จำนวน 7 รายการ

ลำดับ ที่	สารมลพิษ	วิธีวิเคราะห์
1	Carbon Monoxide	1) Sampling Bag, Non-Dispersive Infrared Method ^[5] 2) Instrumental Analyzer Method ^[9]
2	Hydrogen Sulfide	Absorption Sampling, Iodometric Method ^[5]
3	Opacity	Ringelmanns Method ^[3,4]
4	Oxide of Nitrogen	1) Absorption Sampling, Phenoldisulfonic Acid Method ^[8] 2) Instrumental Analyzer Method ^[10]
5	Sulfur Dioxide	1) Absorption Sampling, Barium-Thorin Titrimetric Acid Method ^[5] 2) Instrumental Analyzer Method ^[11]
6	Sulfuric Acid	Isokinetic Sampling, Barium -- Titrimetric Method ^[6]
7	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method ^[7]

เอกสารอ้างอิง

1. ธงชัย พรหมสวัสดิ์ และวิบูลย์ลักษณ์ วิสุทธิศักดิ์, บรรณาธิการ. (2547) คู่มือวิเคราะห์น้ำเสีย. พิมพ์ครั้งที่ 4. กรุงเทพฯ: สมาคมวิศวกรรมสิ่งแวดล้อมแห่งประเทศไทย.
2. APHA, AWWA, WEF. Standard Methods for the Examination of Water and Wastewater. 24th ed. Washington, DC : APHA, 2023
3. กระทรวงอุตสาหกรรม. ประกาศกระทรวงอุตสาหกรรม, พ.ศ. 2549. เรื่อง กำหนดค่าปริมาณเขม่าควันที่เจือปนในอากาศที่ระบายออกจากปล่องของหม้อน้ำโรงสีข้าวที่ใช้กลบเป็นเชื้อเพลิง. ราชกิจจานุเบกษา. 4 ธันวาคม 2549. เล่มที่ 123 ตอนพิเศษ 125ง
4. กระทรวงอุตสาหกรรม. ประกาศกระทรวงอุตสาหกรรม, พ.ศ. 2549. เรื่อง กำหนดค่าปริมาณเขม่าควันที่เจือปนในอากาศที่ระบายออกจากปล่องของหม้อน้ำของโรงงาน. ราชกิจจานุเบกษา. 4 ธันวาคม 2549. เล่มที่ 123 ตอนพิเศษ 125ง
5. United States Environmental Protection Agency. Standards of Performance for New Stationary Sources. 40 CFR 60. Appendix A, 2017.
6. United States Environmental Protection Agency. Standards of Performance for New Stationary Sources. 40 CFR 60. Appendix A, 2019.

7. United States...

7. United States Environmental Protection Agency. Standards of Performance for New Stationary Sources. 40 CFR 60. Appendix A, 2020.
8. United States Environmental Protection Agency. Standards of Performance for New Stationary Sources. 40 CFR 60. Appendix A, 2023.
9. United States Environmental Protection Agency. Determination of Carbon Monoxide Emission from Stationary Sources; Instrumental Analyzer Procedure. 40 CFR 60. Appendix A Method 10, 2017.
10. United States Environmental Protection Agency. Determination of Oxide of Nitrogen Emission from Stationary Sources; Instrumental Analyzer Procedure. 40 CFR 60. Appendix A Method 7E, 2023.
11. United States Environmental Protection Agency. Determination of Sulfur dioxide Emission from Stationary Sources; Instrumental Analyzer Procedure. 40 CFR 60. Appendix A Method 6C, 2017.



ที่ อก.๐๓๐๑/ ๓๐ ๐๕๕



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๒๕ ตุลาคม ๒๕๖๕

เพื่อ แยกย้ายยื่นขอใบอนุญาตนับถือการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท แอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง หนังสือ บริษัท แอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขที่ EHV 2024/005 ลงวันที่ ๑๐ สิงหาคม ๒๕๖๕

ตามที่หนังสืออ้างอิง บริษัท แอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ท้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๑๒๓ สถานที่ตั้งเลขที่ ๖๑๖/๑๐ หมู่ที่ ๕ ตำบลแม่ไม้ อำเภอลำปางและจังหวัดระยอง ขอแจ้งข้อเท็จจริงที่ผู้ประกอบการวิเคราะห์เอกชน เนื่องจากมีความคลาดเคลื่อน ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรม ได้รับทราบและดำเนินการแก้ไขรายชื่อเจ้าหน้าที่ปฏิบัติการวิเคราะห์เอกชน จำนวน ๕ ราย ตามที่แจ้งเวียนเรียบร้อยแล้ว เป็นดังนี้

- ลำดับที่ ๒๗ นางพจนา สีลา
- ลำดับที่ ๒๘ นางสาวอนิศา กุลสุวังค์
- ลำดับที่ ๓๐ นางชลธิชา สุขงา
- ลำดับที่ ๓๒ นายสุทธิสารค์ โชคปิสิมันท์
- ลำดับที่ ๓๓ นายกันตภณ มณีสัมพันธ์

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ


(นายพรศ กสินกรอ)
นายกสมาคมผู้ประกอบการโรงงานอุตสาหกรรม

ศูนย์วิจัยและพัฒนาระบบพลังงานภาคตะวันออก
โทร. ๐ ๓๓๓๓ ๖๐๕๕ ต่อ ๕๐๐๑-๒
อีเมล: einv@cdw.mail.go.th

 "อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"



ที่ อก.๐๓๐๑(๓)/ ๔๒ ๔ ๖



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

๒๐ พฤษภาคม ๒๕๖๕

เรื่อง ยกเลิกบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท แอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน ลงวันที่ ๑๐ เมษายน ๒๕๖๕

ตามคำขออ้างอิง บริษัท แอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ท้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๑๒๓ สถานที่ตั้งเลขที่ ๖๑๖/๑๐ หมู่ที่ ๕ ตำบลแม่ไม้ อำเภอลำปางและจังหวัดระยอง ขอยกเลิกบุคลากร ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้ออกเลิกเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน จำนวน ๑ ราย ได้แก่ นายปรามณ สัตยาคณ ทะเบียนเลขที่ ๖-๑๒๓-๖-๐๐๕๑

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ



(นายประสม ดำรงพงษ์)
ผู้อำนวยการวิจัยและพัฒนาระบบพลังงาน
ปฏิบัติการงานวิจัยและพัฒนาระบบพลังงานภาคตะวันออก

ศูนย์วิจัยและพัฒนาระบบพลังงานภาคตะวันออก
โทร. ๐ ๓๓๓๓ ๖๐๕๕ ต่อ ๕๐๐๑-๒
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"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"





๒๗ พฤษภาคม ๒๕๖๘

เรื่อง เปลี่ยนแปลงชื่อ-สกุลบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๑๕ พฤษภาคม ๒๕๖๘ตามคำขอที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการ
วิเคราะห์เอกชน เลขทะเบียน ๖-๓๒๓ สถานที่ตั้งเลขที่ ๖๑๖/๑๐ หมู่ที่ ๕ ตำบลแม่ไม้คู อำเภอบลุกแดง
จังหวัดระยอง ขอเปลี่ยนแปลงชื่อ-สกุลบุคลากร ความละเอียดแจ้งแล้ว นั้นกรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้เปลี่ยนแปลงชื่อ-สกุลบุคลากร จำนวน ๑ ราย
จากนายเชยสิทธิ์ วงศ์ชาโย เป็น นายอมลวิทย์ วงศ์ชาโย

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายประจักษ์ ดำรงธรรม)
ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก

โทร. ๐ ๓๓๓๓ ๖๐๕๕ ต่อ ๕๐๐๑-๒

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"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"



๐๒ ธันวาคม ๒๕๖๘

เรื่อง เปลี่ยนแปลงสารมลพิษที่วิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๓๑ ตุลาคม ๒๕๖๘

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือเปลี่ยนแปลงสารมลพิษที่วิเคราะห์

บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด จำนวน ๒ แผ่น

ตามคำขอที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการ
วิเคราะห์เอกชน เลขทะเบียน ๖-๓๒๓ สถานที่ตั้งเลขที่ ๖๑๖/๑๐ หมู่ที่ ๕ ตำบลแม่ไม้คู อำเภอบลุกแดง
จังหวัดระยอง ขอเปลี่ยนแปลงสารมลพิษที่วิเคราะห์ ต่อกรมโรงงานอุตสาหกรรม นั้นกรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด
เพิ่มขอบข่ายชนิดสารมลพิษที่วิเคราะห์ในน้ำเสีย และน้ำใต้ดิน ตามสิ่งที่ส่งมาด้วยอนึ่ง หนังสือฉบับนี้จะสิ้นสุดอายุพร้อมหนังสือต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
ในวันที่ ๒๘ มิถุนายน ๒๕๖๙

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นางสาวปัทมวรรณ คุณประเสริฐ)

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก

โทร. ๐ ๓๓๓๓ ๖๐๕๕ ต่อ ๕๐๐๑-๒

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"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"



เอกสารแนบท้ายหนังสือเปลี่ยนแปลงสารมลพิษที่วิเคราะห์

บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ๖-๓๒๓

ที่ อก ๐๓๑๐(๓)/ ๕๗๖๔ ลงวันที่ ๐๒ ธันวาคม ๒๕๖๘

ขอขยายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๒๓ รายการ

น้ำเสีย จำนวน 13 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Arsenic	Digestion, Inductively Coupled Plasma Method
2	Barium	Digestion, Inductively Coupled Plasma Method
3	Cadmium	Digestion, Inductively Coupled Plasma Method
4	Chromium	Digestion, Inductively Coupled Plasma Method
5	Copper	Digestion, Inductively Coupled Plasma Method
6	Hexavalent Chromium	Colorimetric Method
7	Lead	Digestion, Inductively Coupled Plasma Method
8	Manganese	Digestion, Inductively Coupled Plasma Method
9	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method
10	Nickel	Digestion, Inductively Coupled Plasma Method
11	Selenium	Digestion, Inductively Coupled Plasma Method
12	Trivalent Chromium	Calculation
13	Zinc	Digestion, Inductively Coupled Plasma Method

น้ำใต้ดิน จำนวน 20 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aluminum	Digestion, Inductively Coupled Plasma Method
2	Antimony	Digestion, Inductively Coupled Plasma Method
3	Arsenic	Digestion, Inductively Coupled Plasma Method
4	Barium	Digestion, Inductively Coupled Plasma Method
5	Beryllium	Digestion, Inductively Coupled Plasma Method
6	Cadmium	Digestion, Inductively Coupled Plasma Method
7	Chromium	Digestion, Inductively Coupled Plasma Method
8	Chromium (III)	Calculation
9	Chromium (VI)	Colorimetric Method
10	Copper	Digestion, Inductively Coupled Plasma Method

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
11	Iron	Digestion, Inductively Coupled Plasma Method
12	Lead	Digestion, Inductively Coupled Plasma Method
13	Manganese	Digestion, Inductively Coupled Plasma Method
14	Mercury	Digestion Cold-Vapor Atomic Absorption Spectrometric Method
15	Molybdenum	Digestion, Inductively Coupled Plasma Method
16	Nickel	Digestion, Inductively Coupled Plasma Method
17	Selenium	Digestion, Inductively Coupled Plasma Method
18	Silver	Digestion, Inductively Coupled Plasma Method
19	Vanadium	Digestion, Inductively Coupled Plasma Method
20	Zinc	Digestion, Inductively Coupled Plasma Method

เอกสารอ้างอิง

APHA, AWWA, WEF. Standard Methods for the Examination of Water and Wastewater. 24th ed. Washington, DC: APHA, 2023.



บริษัท เอแอลเอส แลборาทอรี กรุ๊ป (ประเทศไทย) จำกัด
104 ซอยพัฒนาการ 40 ถนนพัฒนาการ แขวงพัฒนาการ เขตสวนหลวง กรุงเทพมหานคร 10250
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