ภาคผนวก ค

ผลการตรวจวัดคุณภาพสิ่งแวดล้อม

ภาคผนวก ค-1

คุณภาพอากาศในบรรยากาศ

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542333
Date Received : May 26, 2025
Date Reported : May 31, 2025
Report Number: 3298731-1

Sample Description Air Quality
Location บ้านโปร่งแร้ง
(GPS 47P 0707784, 1592838)
Parameter Nitrogen dioxide (ppm)
Measurement Date May 16, 2025 - May 23, 2025
Measurement by Vanich Phanpipit

Time	2542333-1 May 16, 2025	2542333-2 May 17, 2025	2542333-3 May 18, 2025	2542333-4 May 19, 2025	2542333-5 May 20, 2025	2542333-6 May 21, 2025	2542333-7 May 22, 2025
12:00 PM - 01:00 PM	0.0166	0.0099	0.0067	0.0166	0.0147	0.0196	0.0134
01:00 PM - 02:00 PM	0.0147	0.0159	0.0109	0.0147	0.0180	0.0058	0.0116
02:00 PM - 03:00 PM	0.0179	0.0041	0.0103	0.0179	0.0178	0.0048	0.0184
03:00 PM - 04:00 PM	0.0072	0.0113	0.0140	0.0238	0.0212	0.0071	0.0064
04:00 PM - 05:00 PM	0.0081	0.0137	0.0068	0.0281	0.0174	0.0017	0.0036
05:00 PM - 06:00 PM	0.0105	0.0211	0.0034	0.0216	0.0259	0.0109	0.0037
06:00 PM - 07:00 PM	0.0120	0.0141	0.0029	0.0190	0.0143	0.0249	0.0034
07:00 PM - 08:00 PM	0.0057	0.0046	0.0024	0.0131	0.0074	0.0280	0.0064
08:00 PM - 09:00 PM	0.0044	0.0028	0.0068	0.0071	0.0036	0.0221	0.0025
09:00 PM - 10:00 PM	0.0074	0.0024	0.0049	0.0105	0.0037	0.0128	0.0164
10:00 PM - 11:00 PM	0.0113	0.0015	0.0102	0.0101	0.0180	0.0075	0.0071
11:00 PM - 12:00 AM	0.0113	0.0027	0.0061	0.0048	0.0085	0.0062	0.0048
12:00 AM - 01:00 AM	0.0036	0.0025	0.0032	0.0049	0.0071	0.0064	0.0049
01:00 AM - 02:00 AM	0.0070	0.0038	0.0034	0.0066	0.0064	0.0074	0.0121
02:00 AM - 03:00 AM	0.0075	0.0047	0.0042	0.0045	0.0043	0.0103	0.0074
03:00 AM - 04:00 AM	0.0030	0.0285	0.0025	0.0040	0.0048	0.0149	0.0103
04:00 AM - 05:00 AM	0.0030	0.0432	0.0233	0.0035	0.0031	0.0225	0.0078
05:00 AM - 06:00 AM	0.0032	0.0367	0.0139	0.0129	0.0046	0.0548	0.0117
06:00 AM - 07:00 AM	0.0029	0.0338	0.0036	0.0028	0.0054	0.0422	0.0071
07:00 AM - 08:00 AM	0.0058	0.0132	0.0028	0.0038	0.0047	0.0348	0.0128
08:00 AM - 09:00 AM	0.0048	0.0087	0.0071	0.0167	0.0225	0.0089	0.0115
09:00 AM - 10:00 AM	0.0051	0.0115	0.0095	0.0208	0.0205	0.0197	0.0230
10:00 AM - 11:00 AM	0.0146	0.0097	0.0137	0.0172	0.0191	0.0186	0.0181
11:00 AM - 12:00 PM	0.0103	0.0081	0.0163	0.0194	0.0205	0.0211	0.0196
Average	0.0082	0.0129	0.0079	0.0127	0.0122	0.0172	0.0102
1hr - Maximum	0.0179	0.0432	0.0233	0.0281	0.0259	0.0548	0.0230
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 AgencyMethod Part 50 App. F (Chemiluminescence)

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

Orawan Rakyong
Scientist (3)

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Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542333
Date Received : May 26, 2025
Date Reported : May 31, 2025
Report Number: 3321569-1

Sample Description Air Quality
Location วัดบัวลอย
(GPS 47P 0698548, 1594246)
Parameter Nitrogen dioxide (ppm)
Measurement Date May 16, 2025 - May 23, 2025
Measurement by Vanich Phanpipit

Time	2542333-8 May 16, 2025	2542333-9 May 17, 2025	2542333-10 May 18, 2025	2542333-11 May 19, 2025	2542333-12 May 20, 2025	2542333-13 May 21, 2025	2542333-14 May 22, 2025
11:00 AM - 12:00 PM	0.0048	0.0055	0.0052	0.0055	0.0041	0.0042	0.0038
12:00 PM - 01:00 PM	0.0044	0.0052	0.0058	0.0049	0.0040	0.0038	0.0040
01:00 PM - 02:00 PM	0.0042	0.0047	0.0054	0.0049	0.0045	0.0050	0.0036
02:00 PM - 03:00 PM	0.0044	0.0056	0.0053	0.0047	0.0048	0.0041	0.0041
03:00 PM - 04:00 PM	0.0051	0.0052	0.0054	0.0053	0.0049	0.0043	0.0038
04:00 PM - 05:00 PM	0.0064	0.0050	0.0061	0.0055	0.0043	0.0042	0.0040
05:00 PM - 06:00 PM	0.0055	0.0050	0.0063	0.0052	0.0046	0.0039	0.0043
06:00 PM - 07:00 PM	0.0059	0.0058	0.0054	0.0045	0.0049	0.0038	0.0037
07:00 PM - 08:00 PM	0.0059	0.0052	0.0055	0.0053	0.0042	0.0044	0.0040
08:00 PM - 09:00 PM	0.0066	0.0061	0.0058	0.0055	0.0047	0.0036	0.0039
09:00 PM - 10:00 PM	0.0056	0.0062	0.0056	0.0054	0.0050	0.0042	0.0038
10:00 PM - 11:00 PM	0.0050	0.0059	0.0063	0.0049	0.0044	0.0048	0.0044
11:00 PM - 12:00 AM	0.0058	0.0056	0.0055	0.0049	0.0040	0.0046	0.0038
12:00 AM - 01:00 AM	0.0054	0.0053	0.0046	0.0049	0.0047	0.0044	0.0041
01:00 AM - 02:00 AM	0.0061	0.0061	0.0050	0.0055	0.0046	0.0047	0.0047
02:00 AM - 03:00 AM	0.0050	0.0044	0.0053	0.0055	0.0048	0.0043	0.0043
03:00 AM - 04:00 AM	0.0051	0.0051	0.0047	0.0054	0.0044	0.0043	0.0044
04:00 AM - 05:00 AM	0.0057	0.0057	0.0047	0.0064	0.0042	0.0041	0.0039
05:00 AM - 06:00 AM	0.0057	0.0031	0.0053	0.0081	0.0044	0.0042	0.0041
06:00 AM - 07:00 AM	0.0053	0.0036	0.0053	0.0039	0.0047	0.0035	0.0048
07:00 AM - 08:00 AM	0.0056	0.0023	0.0046	0.0040	0.0043	0.0042	0.0040
08:00 AM - 09:00 AM	0.0050	0.0058	0.0052	0.0042	0.0044	0.0040	0.0043
09:00 AM - 10:00 AM	0.0053	0.0056	0.0054	0.0042	0.0041	0.0045	0.0035
10:00 AM - 11:00 AM	0.0055	0.0059	0.0051	0.0037	0.0045	0.0039	0.0036
Average	0.0054	0.0052	0.0054	0.0051	0.0045	0.0042	0.0040
1hr - Maximum	0.0066	0.0062	0.0063	0.0081	0.0050	0.0050	0.0048
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 AgencyMethod Part 50 App. F (Chemiluminescence)

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

Orawan Rakyong
Scientist (3)

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Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542333
Date Received : May 26, 2025
Date Reported : May 31, 2025
Report Number: 3321570-1

Sample Description Air Quality
Location โรงเรียนบ้านใหม่ทุ่งดินขอ
(GPS 47P 0697254, 1589430)
Parameter Nitrogen dioxide (ppm)
Measurement Date May 16, 2025 - May 23, 2025
Measurement by Vanich Phanpipit

Time	2542333-15 May 16, 2025	2542333-16 May 17, 2025	2542333-17 May 18, 2025	2542333-18 May 19, 2025	2542333-19 May 20, 2025	2542333-20 May 21, 2025	2542333-21 May 22, 2025
09:00 AM - 10:00 AM	0.0010	0.0009	0.0010	0.0009	0.0009	0.0009	0.0010
10:00 AM - 11:00 AM	0.0005	0.0009	0.0008	0.0009	0.0008	0.0009	0.0009
11:00 AM - 12:00 PM	0.0009	0.0009	0.0009	0.0009	0.0009	0.0010	0.0009
12:00 PM - 01:00 PM	0.0007	0.0008	0.0009	0.0009	0.0010	0.0009	0.0008
01:00 PM - 02:00 PM	0.0008	0.0009	0.0010	0.0008	0.0009	0.0009	0.0008
02:00 PM - 03:00 PM	0.0009	0.0010	0.0010	0.0008	0.0009	0.0008	0.0009
03:00 PM - 04:00 PM	0.0010	0.0008	0.0009	0.0011	0.0009	0.0009	0.0009
04:00 PM - 05:00 PM	0.0008	0.0009	0.0009	0.0008	0.0009	0.0009	0.0008
05:00 PM - 06:00 PM	0.0008	0.0008	0.0009	0.0009	0.0010	0.0008	0.0010
06:00 PM - 07:00 PM	0.0009	0.0009	0.0009	0.0010	0.0009	0.0010	0.0010
07:00 PM - 08:00 PM	0.0010	0.0008	0.0009	0.0009	0.0008	0.0010	0.0009
08:00 PM - 09:00 PM	0.0010	0.0009	0.0009	0.0008	0.0009	0.0010	0.0010
09:00 PM - 10:00 PM	0.0009	0.0009	0.0009	0.0009	0.0009	0.0010	0.0008
10:00 PM - 11:00 PM	0.0010	0.0009	0.0008	0.0009	0.0009	0.0009	0.0010
11:00 PM - 12:00 AM	0.0010	0.0009	0.0010	0.0010	0.0009	0.0009	0.0009
12:00 AM - 01:00 AM	0.0007	0.0009	0.0010	0.0011	0.0010	0.0010	0.0010
01:00 AM - 02:00 AM	0.0010	0.0008	0.0010	0.0010	0.0009	0.0009	0.0010
02:00 AM - 03:00 AM	0.0010	0.0008	0.0009	0.0008	0.0010	0.0010	0.0010
03:00 AM - 04:00 AM	0.0010	0.0008	0.0009	0.0009	0.0009	0.0009	0.0010
04:00 AM - 05:00 AM	0.0010	0.0009	0.0008	0.0009	0.0009	0.0010	0.0008
05:00 AM - 06:00 AM	0.0010	0.0008	0.0010	0.0009	0.0009	0.0009	0.0009
06:00 AM - 07:00 AM	0.0009	0.0009	0.0008	0.0010	0.0009	0.0011	0.0009
07:00 AM - 08:00 AM	0.0009	0.0051	0.0008	0.0009	0.0009	0.0009	0.0009
08:00 AM - 09:00 AM	0.0008	0.0009	0.0009	0.0009	0.0009	0.0010	0.0009
Average	0.0009	0.0010	0.0009	0.0009	0.0009	0.0009	0.0009
1hr - Maximum	0.0010	0.0051	0.0010	0.0011	0.0010	0.0011	0.0010
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 AgencyMethod Part 50 App. F (Chemiluminescence)

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
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Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542333
Date Received : May 26, 2025
Date Reported : May 31, 2025
Report Number: 3321572-1

Sample Description Air Quality
Location โรงเรียนวัดหนองปลาหมอ
(GPS 47P 0700770, 1590932)
Parameter Nitrogen dioxide (ppm)
Measurement Date May 16, 2025 - May 23, 2025
Measurement by Vanich Phanpipit

Time	2542333-22 May 16, 2025	2542333-23 May 17, 2025	2542333-24 May 18, 2025	2542333-25 May 19, 2025	2542333-26 May 20, 2025	2542333-27 May 21, 2025	2542333-28 May 22, 2025
10:00 AM - 11:00 AM	0.0116	0.0053	0.0063	0.0022	0.0026	0.0069	0.0035
11:00 AM - 12:00 PM	0.0127	0.0075	0.0065	0.0021	0.0024	0.0077	0.0034
12:00 PM - 01:00 PM	0.0025	0.0062	0.0071	0.0062	0.0035	0.0110	0.0035
01:00 PM - 02:00 PM	0.0011	0.0047	0.0040	0.0024	0.0037	0.0052	0.0040
02:00 PM - 03:00 PM	0.0009	0.0038	0.0027	0.0039	0.0037	0.0043	0.0040
03:00 PM - 04:00 PM	0.0016	0.0067	0.0032	0.0048	0.0038	0.0065	0.0048
04:00 PM - 05:00 PM	0.0053	0.0084	0.0046	0.0131	0.0041	0.0116	0.0046
05:00 PM - 06:00 PM	0.0073	0.0063	0.0029	0.0113	0.0055	0.0127	0.0067
06:00 PM - 07:00 PM	0.0049	0.0037	0.0039	0.0160	0.0099	0.0169	0.0090
07:00 PM - 08:00 PM	0.0050	0.0023	0.0046	0.0110	0.0117	0.0192	0.0094
08:00 PM - 09:00 PM	0.0055	0.0038	0.0050	0.0066	0.0111	0.0177	0.0101
09:00 PM - 10:00 PM	0.0053	0.0044	0.0049	0.0067	0.0079	0.0156	0.0067
10:00 PM - 11:00 PM	0.0046	0.0070	0.0078	0.0061	0.0034	0.0134	0.0078
11:00 PM - 12:00 AM	0.0040	0.0059	0.0068	0.0054	0.0067	0.0095	0.0076
12:00 AM - 01:00 AM	0.0052	0.0037	0.0054	0.0047	0.0078	0.0085	0.0042
01:00 AM - 02:00 AM	0.0054	0.0026	0.0057	0.0053	0.0076	0.0085	0.0035
02:00 AM - 03:00 AM	0.0053	0.0039	0.0063	0.0057	0.0068	0.0064	0.0046
03:00 AM - 04:00 AM	0.0055	0.0052	0.0076	0.0058	0.0073	0.0046	0.0038
04:00 AM - 05:00 AM	0.0054	0.0049	0.0072	0.0057	0.0066	0.0049	0.0082
05:00 AM - 06:00 AM	0.0058	0.0044	0.0050	0.0055	0.0077	0.0056	0.0096
06:00 AM - 07:00 AM	0.0066	0.0002	0.0035	0.0056	0.0052	0.0140	0.0090
07:00 AM - 08:00 AM	0.0080	0.0038	0.0041	0.0045	0.0035	0.0061	0.0073
08:00 AM - 09:00 AM	0.0062	0.0024	0.0042	0.0036	0.0029	0.0049	0.0077
09:00 AM - 10:00 AM	0.0062	0.0407	0.0017	0.0025	0.0067	0.0054	0.0052
Average	0.0055	0.0062	0.0050	0.0061	0.0059	0.0095	0.0062
1hr - Maximum	0.0127	0.0407	0.0078	0.0160	0.0117	0.0192	0.0101
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 AgencyMethod Part 50 App. F (Chemiluminescence)

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

Orawan Rakyong
Scientist (3)

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Analysis / Test Report

LABORATORY ACCREDITATION
BLA-DSS
TESTING
No.0009

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542334
Date Received : May 26, 2025
Date Reported : Jun 02, 2025
Report Number: 3322229-1

Sample Description Air Quality
Location บ้านโป่งแร้ง (GPS 47P 0707784, 1592838)
Date Analysis Commenced May 27, 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	Total Suspended Particulate (mg/m3)	Particulate Matter (PM-10) (mg/m3)	Barometric Pressure (mm Hg)	Atmospheric Temperature (°C)
2542334-1	May 16 - May 17, 2025	0.025	0.020	756*	32.4*
2542334-2	May 17 - May 18, 2025	0.032	0.026	756*	32.4*
2542334-3	May 18 - May 19, 2025	0.026	0.022	756*	32.4*
2542334-4	May 19 - May 20, 2025	0.035	0.027	756*	32.4*
2542334-5	May 20 - May 21, 2025	0.047	0.030	756*	32.4*
2542334-6	May 21 - May 22, 2025	0.037	0.024	756*	32.4*
2542334-7	May 22 - May 23, 2025	0.036	0.024	756*	32.4*
Guideline		0.33	0.12	-	-

Reference Method

Total Suspended Particulate : In - house method : STM 04-051 based on U.S. Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)
Particulate Metter (PM-10) : In - house method : STM 04-052 based on U.S. Environmental Protection Agency 40 CFR, method 50, Appendix J, revised as of July 1, 2008 (Include sampling)

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

Remark : Result (s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
-

Approved by
Saranya C.
Saranya Chalermthamrong
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.

Analysis / Test Report

LABORATORY ACCREDITATION BLA-DSS

TESTING No.0009

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542334
Date Received : May 26, 2025
Date Reported : Jun 02, 2025
Report Number: 3322230-1

Sample Description Air Quality
Location วัดบัวลอย (GPS 47P 0698548, 1594246)
Date Analysis Commenced May 27, 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	Total Suspended Particulate (mg/m3)	Particulate Matter (PM-10) (mg/m3)	Barometric Pressure (mm Hg)	Atmospheric Temperature (°C)
2542334-8	May 16 - May 17, 2025	0.037	0.024	756*	32.4*
2542334-9	May 17 - May 18, 2025	0.039	0.027	756*	32.4*
2542334-10	May 18 - May 19, 2025	0.043	0.031	756*	32.4*
2542334-11	May 19 - May 20, 2025	0.040	0.027	756*	32.4*
2542334-12	May 20 - May 21, 2025	0.057	0.030	756*	32.4*
2542334-13	May 21 - May 22, 2025	0.031	0.027	756*	32.4*
2542334-14	May 22 - May 23, 2025	0.049	0.027	756*	32.4*
Guideline		0.33	0.12	-	-

Reference Method

Total Suspended Particulate : In - house method : STM 04-051 based on U.S. Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)
Particulate Metter (PM-10) : In - house method : STM 04-052 based on U.S. Environmental Protection Agency 40 CFR, method 50, Appendix J, revised as of July 1, 2008 (Include sampling)

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

Remark : Result (s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
-

Approved by

Saranya C.

Saranya Chalermthamrong
Scientist (4)

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Analysis / Test Report

LABORATORY ACCREDITATION
BLA-DSS
TESTING
No.0009

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542334
Date Received : May 26, 2025
Date Reported : Jun 02, 2025
Report Number: 3322231-1

Sample Description Air Quality
Location โรงเรียนบ้านใหม่ทุ่งดินขอ (GPS 47P 0697254, 1589430)
Date Analysis Commenced May 27, 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	Total Suspended Particulate (mg/m3)	Particulate Matter (PM-10) (mg/m3)	Barometric Pressure (mm Hg)	Atmospheric Temperature (°C)
2542334-15	May 16 - May 17, 2025	0.053	0.049	756*	32.4*
2542334-16	May 17 - May 18, 2025	0.048	0.042	756*	32.4*
2542334-17	May 18 - May 19, 2025	0.058	0.039	756*	32.4*
2542334-18	May 19 - May 20, 2025	0.056	0.033	756*	32.4*
2542334-19	May 20 - May 21, 2025	0.057	0.037	756*	32.4*
2542334-20	May 21 - May 22, 2025	0.060	0.036	756*	32.4*
2542334-21	May 22 - May 23, 2025	0.055	0.035	756*	32.4*
Guideline		0.33	0.12	-	-

Reference Method

Total Suspended Particulate : In - house method : STM 04-051 based on U.S. Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)
Particulate Metter (PM-10) : In - house method : STM 04-052 based on U.S. Environmental Protection Agency 40 CFR, method 50, Appendix J, revised as of July 1, 2008 (Include sampling)

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

Remark : Result (s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
-

Approved by
Saranya C.
Saranya Chalermthamrong
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.

Analysis / Test Report

LABORATORY ACCREDITATION
BLA-DSS
TESTING
No.0009

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542334
Date Received : May 26, 2025
Date Reported : Jun 02, 2025
Report Number: 3298734-1

Sample Description Air Quality
Location โรงเรียนวัดหนองปลาหมอ (GPS 47P 0700770, 1590932)
Date Analysis Commenced May 27, 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	Total Suspended Particulate (mg/m3)	Particulate Matter (PM-10) (mg/m3)	Barometric Pressure (mm Hg)	Atmospheric Temperature (°C)
2542334-22	May 16 - May 17, 2025	0.033	0.029	756*	32.4*
2542334-23	May 17 - May 18, 2025	0.044	0.028	756*	32.4*
2542334-24	May 18 - May 19, 2025	0.046	0.029	756*	32.4*
2542334-25	May 19 - May 20, 2025	0.035	0.025	756*	32.4*
2542334-26	May 20 - May 21, 2025	0.042	0.030	756*	32.4*
2542334-27	May 21 - May 22, 2025	0.049	0.031	756*	32.4*
2542334-28	May 22 - May 23, 2025	0.047	0.028	756*	32.4*
Guideline		0.33	0.12	-	-

Reference Method

Total Suspended Particulate : In - house method : STM 04-051 based on U.S. Environmental Protection Agency 40 CFR, method 50, Appendix B, revised as of July 1, 2008 (Include sampling)
Particulate Metter (PM-10) : In - house method : STM 04-052 based on U.S. Environmental Protection Agency 40 CFR, method 50, Appendix J, revised as of July 1, 2008 (Include sampling)

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

Remark : Result (s) marked * is/are not included in scope of Accreditation ISO/IEC 17025.
-

Approved by
Saranya C.
Saranya Chalermthamrong
Scientist (4)

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Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542338
Date Received : May 26, 2025
Date Reported : May 31, 2025
Report Number: 3298736-1

Sample Description Air Quality
Location บ้านโปร่งแร้ง
(GPS 47P 0707784, 1592838)
Parameter Sulfur Dioxide (ppm)
Measurement Date May 16, 2025 - May 23, 2025
Measurement by Vanich Phanpipit

Time	2542338-1 May 16, 2025	2542338-2 May 17, 2025	2542338-3 May 18, 2025	2542338-4 May 19, 2025	2542338-5 May 20, 2025	2542338-6 May 21, 2025	2542338-7 May 22, 2025
12:00 PM - 01:00 PM	0.0012	0.0012	0.0012	0.0012	0.0012	0.0010	0.0013
01:00 PM - 02:00 PM	0.0011	0.0011	0.0012	0.0012	0.0011	0.0011	0.0010
02:00 PM - 03:00 PM	0.0011	0.0010	0.0012	0.0011	0.0012	0.0011	0.0010
03:00 PM - 04:00 PM	0.0015	0.0009	0.0011	0.0011	0.0012	0.0011	0.0010
04:00 PM - 05:00 PM	0.0015	0.0009	0.0010	0.0011	0.0012	0.0010	0.0010
05:00 PM - 06:00 PM	0.0013	0.0010	0.0010	0.0010	0.0012	0.0011	0.0009
06:00 PM - 07:00 PM	0.0012	0.0010	0.0010	0.0010	0.0011	0.0010	0.0009
07:00 PM - 08:00 PM	0.0010	0.0010	0.0009	0.0010	0.0010	0.0010	0.0008
08:00 PM - 09:00 PM	0.0010	0.0010	0.0010	0.0009	0.0010	0.0010	0.0008
09:00 PM - 10:00 PM	0.0011	0.0010	0.0010	0.0010	0.0011	0.0010	0.0008
10:00 PM - 11:00 PM	0.0010	0.0010	0.0010	0.0010	0.0011	0.0010	0.0008
11:00 PM - 12:00 AM	0.0010	0.0010	0.0010	0.0010	0.0011	0.0011	0.0008
12:00 AM - 01:00 AM	0.0010	0.0010	0.0010	0.0010	0.0011	0.0011	0.0009
01:00 AM - 02:00 AM	0.0010	0.0009	0.0009	0.0010	0.0010	0.0010	0.0008
02:00 AM - 03:00 AM	0.0009	0.0009	0.0009	0.0010	0.0010	0.0010	0.0009
03:00 AM - 04:00 AM	0.0009	0.0009	0.0010	0.0010	0.0011	0.0010	0.0009
04:00 AM - 05:00 AM	0.0009	0.0010	0.0010	0.0010	0.0010	0.0010	0.0009
05:00 AM - 06:00 AM	0.0009	0.0009	0.0010	0.0010	0.0010	0.0010	0.0008
06:00 AM - 07:00 AM	0.0010	0.0009	0.0010	0.0010	0.0010	0.0011	0.0009
07:00 AM - 08:00 AM	0.0009	0.0009	0.0010	0.0010	0.0011	0.0011	0.0008
08:00 AM - 09:00 AM	0.0010	0.0010	0.0010	0.0011	0.0011	0.0011	0.0009
09:00 AM - 10:00 AM	0.0010	0.0010	0.0011	0.0011	0.0011	0.0011	0.0009
10:00 AM - 11:00 AM	0.0011	0.0011	0.0011	0.0011	0.0012	0.0011	0.0010
11:00 AM - 12:00 PM	0.0011	0.0012	0.0012	0.0012	0.0012	0.0012	0.0011
Average	0.0011	0.0010	0.0010	0.0010	0.0011	0.0011	0.0009
1hr - Maximum	0.0015	0.0012	0.0012	0.0012	0.0012	0.0012	0.0013
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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Approved by
Orawan Rakyong
Scientist (3)

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542338
Date Received : May 26, 2025
Date Reported : May 31, 2025
Report Number: 3321573-1

Sample Description Air Quality
Location วัดบัวลอย
(GPS 47P 0698548, 1594246)
Parameter Sulfur Dioxide (ppm)
Measurement Date May 16, 2025 - May 23, 2025
Measurement by Vanich Phanpipit

Time	2542338-8 May 16, 2025	2542338-9 May 17, 2025	2542338-10 May 18, 2025	2542338-11 May 19, 2025	2542338-12 May 20, 2025	2542338-13 May 21, 2025	2542338-14 May 22, 2025
11:00 AM - 12:00 PM	0.0033	0.0046	0.0109	0.0101	0.0014	0.0041	0.0026
12:00 PM - 01:00 PM	0.0038	0.0054	0.0022	0.0016	0.0019	0.0005	0.0134
01:00 PM - 02:00 PM	0.0131	0.0116	0.0031	0.0022	0.0025	0.0006	0.0004
02:00 PM - 03:00 PM	0.0252	0.0020	0.0041	0.0028	0.0037	0.0011	0.0004
03:00 PM - 04:00 PM	0.0049	0.0025	0.0046	0.0035	0.0111	0.0013	0.0005
04:00 PM - 05:00 PM	0.0061	0.0040	0.0082	0.0111	0.0011	0.0020	0.0005
05:00 PM - 06:00 PM	0.0079	0.0040	0.0018	0.0015	0.0016	0.0025	0.0006
06:00 PM - 07:00 PM	0.0080	0.0111	0.0032	0.0022	0.0021	0.0090	0.0008
07:00 PM - 08:00 PM	0.0089	0.0016	0.0038	0.0028	0.0031	0.0047	0.0010
08:00 PM - 09:00 PM	0.0082	0.0026	0.0097	0.0034	0.0116	0.0006	0.0011
09:00 PM - 10:00 PM	0.0116	0.0034	0.0026	0.0037	0.0011	0.0007	0.0013
10:00 PM - 11:00 PM	0.0136	0.0035	0.0021	0.0119	0.0013	0.0011	0.0017
11:00 PM - 12:00 AM	0.0061	0.0044	0.0036	0.0011	0.0015	0.0015	0.0023
12:00 AM - 01:00 AM	0.0074	0.0091	0.0108	0.0017	0.0023	0.0017	0.0162
01:00 AM - 02:00 AM	0.0118	0.0022	0.0011	0.0026	0.0033	0.0021	0.0006
02:00 AM - 03:00 AM	0.0079	0.0030	0.0022	0.0032	0.0120	0.0028	0.0005
03:00 AM - 04:00 AM	0.0070	0.0034	0.0033	0.0038	0.0008	0.0136	0.0007
04:00 AM - 05:00 AM	0.0074	0.0041	0.0039	0.0098	0.0009	0.0007	0.0007
05:00 AM - 06:00 AM	0.0213	0.0040	0.0044	0.0011	0.0014	0.0007	0.0007
06:00 AM - 07:00 AM	0.0045	0.0043	0.0045	0.0017	0.0020	0.0009	0.0009
07:00 AM - 08:00 AM	0.0017	0.0042	0.0119	0.0025	0.0028	0.0012	0.0010
08:00 AM - 09:00 AM	0.0026	0.0107	0.0014	0.0033	0.0033	0.0015	0.0012
09:00 AM - 10:00 AM	0.0034	0.0014	0.0022	0.0038	0.0039	0.0018	0.0016
10:00 AM - 11:00 AM	0.0045	0.0033	0.0030	0.0131	0.0100	0.0022	0.0161
Average	0.0083	0.0046	0.0045	0.0044	0.0036	0.0025	0.0028
1hr - Maximum	0.0252	0.0116	0.0119	0.0131	0.0120	0.0136	0.0162
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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Approved by
Orawan Rakyong
Scientist (3)

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542338
Date Received : May 26, 2025
Date Reported : May 31, 2025
Report Number: 3321574-1

Sample Description Air Quality
Location โรงเรียนบ้านใหม่ทุ่งดินขอ (GPS 47P 0697254, 1589430)
Parameter Sulfur Dioxide (ppm)
Measurement Date May 16, 2025 - May 23, 2025
Measurement by Vanich Phanpipit

Time	2542338-15 May 16, 2025	2542338-16 May 17, 2025	2542338-17 May 18, 2025	2542338-18 May 19, 2025	2542338-19 May 20, 2025	2542338-20 May 21, 2025	2542338-21 May 22, 2025
09:00 AM - 10:00 AM	0.0014	0.0014	0.0016	0.0016	0.0015	0.0011	0.0015
10:00 AM - 11:00 AM	0.0013	0.0014	0.0014	0.0015	0.0012	0.0009	0.0013
11:00 AM - 12:00 PM	0.0020	0.0015	0.0013	0.0015	0.0013	0.0010	0.0014
12:00 PM - 01:00 PM	0.0016	0.0015	0.0013	0.0014	0.0013	0.0011	0.0014
01:00 PM - 02:00 PM	0.0017	0.0017	0.0014	0.0014	0.0015	0.0013	0.0014
02:00 PM - 03:00 PM	0.0018	0.0015	0.0016	0.0016	0.0016	0.0014	0.0013
03:00 PM - 04:00 PM	0.0016	0.0014	0.0013	0.0015	0.0017	0.0013	0.0013
04:00 PM - 05:00 PM	0.0015	0.0014	0.0013	0.0014	0.0017	0.0012	0.0014
05:00 PM - 06:00 PM	0.0015	0.0014	0.0012	0.0011	0.0015	0.0012	0.0015
06:00 PM - 07:00 PM	0.0015	0.0016	0.0012	0.0012	0.0012	0.0013	0.0015
07:00 PM - 08:00 PM	0.0015	0.0016	0.0011	0.0014	0.0012	0.0014	0.0014
08:00 PM - 09:00 PM	0.0015	0.0015	0.0012	0.0014	0.0012	0.0013	0.0015
09:00 PM - 10:00 PM	0.0014	0.0016	0.0012	0.0013	0.0014	0.0011	0.0014
10:00 PM - 11:00 PM	0.0014	0.0015	0.0012	0.0013	0.0012	0.0010	0.0010
11:00 PM - 12:00 AM	0.0014	0.0015	0.0013	0.0012	0.0011	0.0011	0.0011
12:00 AM - 01:00 AM	0.0013	0.0014	0.0013	0.0012	0.0011	0.0011	0.0010
01:00 AM - 02:00 AM	0.0014	0.0014	0.0012	0.0012	0.0012	0.0011	0.0011
02:00 AM - 03:00 AM	0.0014	0.0014	0.0013	0.0012	0.0013	0.0011	0.0010
03:00 AM - 04:00 AM	0.0013	0.0016	0.0012	0.0013	0.0014	0.0011	0.0010
04:00 AM - 05:00 AM	0.0014	0.0017	0.0014	0.0014	0.0014	0.0012	0.0010
05:00 AM - 06:00 AM	0.0014	0.0017	0.0016	0.0015	0.0012	0.0012	0.0011
06:00 AM - 07:00 AM	0.0014	0.0016	0.0016	0.0015	0.0012	0.0013	0.0011
07:00 AM - 08:00 AM	0.0015	0.0016	0.0017	0.0017	0.0014	0.0015	0.0014
08:00 AM - 09:00 AM	0.0014	0.0018	0.0019	0.0017	0.0014	0.0016	0.0014
Average	0.0015	0.0015	0.0014	0.0014	0.0013	0.0012	0.0013
1hr - Maximum	0.0020	0.0018	0.0019	0.0017	0.0017	0.0016	0.0015
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

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
Orawan Rakyong
Scientist (3)

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542338
Date Received : May 26, 2025
Date Reported : May 31, 2025
Report Number: 3321575-1

Sample Description Air Quality
Location โรงเรียนวัดหนองปลาหมอ
(GPS 47P 0700770, 1590932)
Parameter Sulfur Dioxide (ppm)
Measurement Date May 16, 2025 - May 23, 2025
Measurement by Vanich Phanpipit

Time	2542338-22 May 16, 2025	2542338-23 May 17, 2025	2542338-24 May 18, 2025	2542338-25 May 19, 2025	2542338-26 May 20, 2025	2542338-27 May 21, 2025	2542338-28 May 22, 2025
10:00 AM - 11:00 AM	0.0022	0.0036	0.0028	0.0023	0.0022	0.0019	0.0020
11:00 AM - 12:00 PM	0.0023	0.0036	0.0028	0.0022	0.0021	0.0020	0.0020
12:00 PM - 01:00 PM	0.0024	0.0036	0.0027	0.0023	0.0021	0.0020	0.0020
01:00 PM - 02:00 PM	0.0058	0.0034	0.0027	0.0022	0.0021	0.0020	0.0018
02:00 PM - 03:00 PM	0.0057	0.0032	0.0026	0.0022	0.0020	0.0020	0.0018
03:00 PM - 04:00 PM	0.0058	0.0032	0.0025	0.0022	0.0020	0.0021	0.0018
04:00 PM - 05:00 PM	0.0057	0.0031	0.0026	0.0023	0.0020	0.0020	0.0019
05:00 PM - 06:00 PM	0.0056	0.0031	0.0025	0.0022	0.0019	0.0020	0.0019
06:00 PM - 07:00 PM	0.0054	0.0030	0.0026	0.0022	0.0020	0.0019	0.0018
07:00 PM - 08:00 PM	0.0051	0.0031	0.0025	0.0021	0.0019	0.0022	0.0018
08:00 PM - 09:00 PM	0.0050	0.0030	0.0025	0.0022	0.0020	0.0020	0.0019
09:00 PM - 10:00 PM	0.0049	0.0031	0.0025	0.0021	0.0019	0.0020	0.0019
10:00 PM - 11:00 PM	0.0048	0.0030	0.0025	0.0021	0.0019	0.0020	0.0019
11:00 PM - 12:00 AM	0.0046	0.0030	0.0025	0.0021	0.0020	0.0020	0.0019
12:00 AM - 01:00 AM	0.0045	0.0030	0.0024	0.0022	0.0019	0.0020	0.0019
01:00 AM - 02:00 AM	0.0044	0.0030	0.0024	0.0021	0.0020	0.0021	0.0019
02:00 AM - 03:00 AM	0.0043	0.0029	0.0024	0.0022	0.0020	0.0021	0.0018
03:00 AM - 04:00 AM	0.0043	0.0029	0.0024	0.0022	0.0019	0.0020	0.0019
04:00 AM - 05:00 AM	0.0041	0.0029	0.0024	0.0021	0.0019	0.0019	0.0019
05:00 AM - 06:00 AM	0.0041	0.0029	0.0024	0.0022	0.0020	0.0020	0.0020
06:00 AM - 07:00 AM	0.0040	0.0020	0.0024	0.0021	0.0019	0.0020	0.0019
07:00 AM - 08:00 AM	0.0040	0.0028	0.0023	0.0021	0.0019	0.0019	0.0019
08:00 AM - 09:00 AM	0.0040	0.0028	0.0010	0.0023	0.0019	0.0021	0.0022
09:00 AM - 10:00 AM	0.0038	0.0028	0.0023	0.0022	0.0020	0.0021	0.0020
Average	0.0044	0.0030	0.0024	0.0022	0.0020	0.0020	0.0019
1hr - Maximum	0.0058	0.0036	0.0028	0.0023	0.0022	0.0022	0.0022
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

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
Orawan Rakyong
Scientist (3)

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140

P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542340
Date Received :May 26, 2025
Date Reported :Jun 02, 2025
Report Number :3298740-1

Sample Number 2542340-1 to 7
Parameter Wind Speed / Wind Direction
Location โรงเรียนบ้านใหม่ทุ่งดินขอ (GPS 47P 0697254, 1589430)
Sampling Date May 16 - May 23, 2025
Sampling by Vanich Phanpipit

Time	May 16 - May 17, 2025			May 17 - May 18, 2025			May 18 - May 19, 2025			May 19 - May 20, 2025			May 20 - May 21, 2025			May 21 - May 22, 2025			May 22 - May 23, 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	1.0	59.0	ENE	0.6	288.0	WNW	1.0	145.0	SE	1.9	209.0	SSW	0.8	138.0	SE	0.4	201.0	SSW	0.8	148.0	SSE
10:00 AM - 11:00 AM	1.5	82.0	E	1.0	106.0	ESE	1.9	298.0	WNW	1.1	87.0	E	0.5	257.0	WSW	3.0	234.0	SW	1.4	216.0	SW
11:00 AM - 12:00 PM	0.9	62.0	ENE	0.8	29.0	NNE	0.9	337.0	NNW	1.3	74.0	ENE	2.1	203.0	SSW	2.2	280.0	W	1.4	175.0	S
12:00 PM - 01:00 PM	1.7	321.0	NW	0.7	240.0	WSW	1.2	201.0	SSW	1.2	272.0	W	0.4	141.0	SE	1.3	87.0	E	2.5	223.0	SW
01:00 PM - 02:00 PM	0.7	201.0	SSW	1.7	163.0	SSE	0.3	293.0	WNW	0.5	169.0	S	2.3	165.0	SSE	1.3	129.0	SE	1.0	223.0	SW
02:00 PM - 03:00 PM	2.7	132.0	SE	1.2	206.0	SSW	2.2	240.0	WSW	2.5	251.0	WSW	1.2	105.0	ESE	1.2	129.0	SE	1.2	256.0	WSW
03:00 PM - 04:00 PM	1.0	288.0	WNW	0.0	-	-	2.2	311.0	NW	2.3	190.0	S	1.5	167.0	SSE	1.1	58.0	ENE	0.6	243.0	WSW
04:00 PM - 05:00 PM	1.2	294.0	WNW	0.0	-	-	0.1	-	-	1.5	272.0	W	1.4	191.0	S	2.1	55.0	NE	0.7	173.0	S
05:00 PM - 06:00 PM	0.5	260.0	W	0.6	309.0	NW	0.0	-	-	1.0	306.0	NW	0.5	196.0	SSW	2.2	339.0	NNW	1.5	195.0	SSW
06:00 PM - 07:00 PM	1.2	165.0	SSE	0.3	196.0	SSW	0.0	-	-	0.4	131.0	SE	0.3	188.0	S	3.7	59.0	ENE	1.5	124.0	SE
07:00 PM - 08:00 PM	1.1	114.0	ESE	0.0	-	-	0.0	-	-	1.4	106.0	ESE	0.2	-	-	2.6	54.0	NE	2.0	156.0	SSE
08:00 PM - 09:00 PM	2.3	129.0	SE	0.0	-	-	0.0	-	-	1.0	153.0	SSE	0.2	-	-	1.1	72.0	ENE	2.4	139.0	SE
09:00 PM - 10:00 PM	2.4	109.0	ESE	1.4	68.0	ENE	0.0	-	-	0.7	166.0	SSE	1.9	121.0	ESE	0.0	-	-	0.9	178.0	S
10:00 PM - 11:00 PM	1.3	123.0	ESE	0.5	359.0	N	0.0	-	-	0.5	145.0	SE	1.1	198.0	SSW	0.0	-	-	0.8	172.0	S
11:00 PM - 12:00 AM	0.0	-	-	0.1	-	-	0.1	-	-	0.6	167.0	SSE	0.3	203.0	SSW	0.0	-	-	0.4	194.0	SSW
12:00 AM - 01:00 AM	0.0	-	-	1.5	312.0	NW	1.4	79.0	E	0.0	-	-	0.0	-	-	0.0	-	-	0.7	260.0	W
01:00 AM - 02:00 AM	0.0	-	-	0.0	-	-	0.0	-	-	0.0	-	-	1.0	117.0	ESE	0.0	-	-	0.0	-	-
02:00 AM - 03:00 AM	0.0	-	-	0.0	-	-	0.0	-	-	1.1	112.0	ESE	1.8	136.0	SE	0.0	-	-	0.7	228.0	SW
03:00 AM - 04:00 AM	1.0	117.0	ESE	1.0	52.0	NE	0.0	-	-	1.2	136.0	SE	1.2	126.0	SE	0.0	-	-	0.0	-	-
04:00 AM - 05:00 AM	1.1	73.0	ENE	1.3	79.0	E	2.6	119.0	ESE	1.2	75.0	ENE	0.8	136.0	SE	0.0	-	-	0.0	-	-
05:00 AM - 06:00 AM	0.0	-	-	0.0	-	-	1.5	122.0	ESE	2.5	152.0	SSE	0.0	-	-	0.0	-	-	0.0	-	-
06:00 AM - 07:00 AM	0.0	-	-	0.0	-	-	1.3	90.0	E	2.0	101.0	E	0.0	-	-	0.1	-	-	0.0	-	-
07:00 AM - 08:00 AM	0.6	306.0	NW	1.4	131.0	SE	1.7	107.0	ESE	2.4	140.0	SE	2.2	129.0	SE	3.3	131.0	SE	0.4	206.0	SSW
08:00 AM - 09:00 AM	1.5	324.0	NW	1.1	178.0	S	2.4	144.0	SE	1.7	96.0	E	1.5	64.0	ENE	2.7	132.0	SE	1.0	120.0	ESE

Reference Method : Cup Anemometer & Anodized Aluminium Vane Method

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Approved by

Sarayuth Jittranont
Assistant General Manager

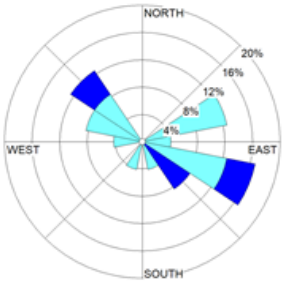
Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140

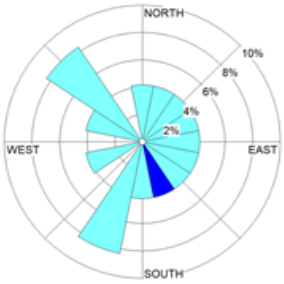
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542340
Date Received :May 26, 2025
Date Reported :Jun 02, 2025
Report Number :3298740-1

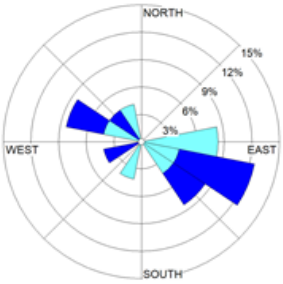
Wind Rose



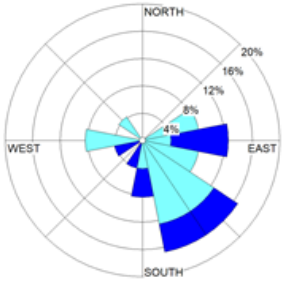
Date : May 16-17, 2025



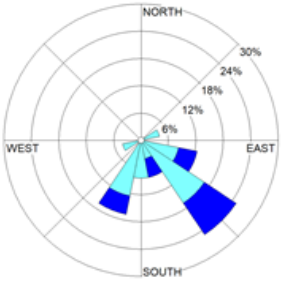
Date : May 17-18, 2025



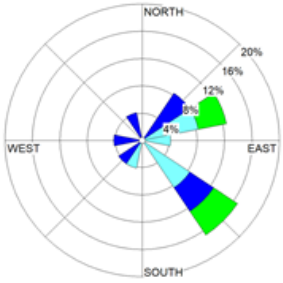
Date : May 18-19, 2025



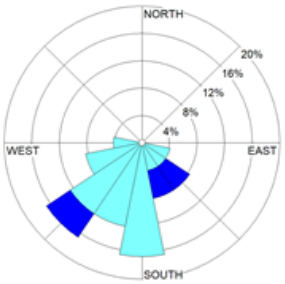
Date : May 19-20, 2025



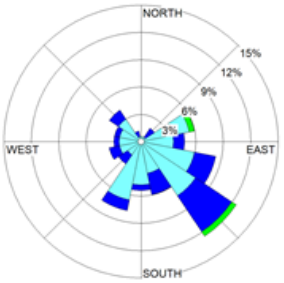
Date : May 20-21, 2025



Date : May 21-22, 2025



Date : May 22-23, 2025



Date : May 16-23, 2025

WS (m/s)		%
	≥ 10.0	0.00
	8.0-10.0	0.00
	5.5-8.0	0.00
	3.3-5.5	1.19
	1.7-3.3	19.05
	0.3-1.7	51.19
	Calms	28.57

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Approved by

Sarayuth Jittranont
Assistant General Manager

ภาคผนวก ค-2

คุณภาพอากาศจากปล่องโรงไฟฟ้า

ผลการตรวจวัดคุณภาพอากาศจากปล่องระบาย

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542350
Date Received :May 22, 2025
Date Reported :Jun 02, 2025
Report Number :3298762-1

Sample Number 2542350-1
Sample Description Emission from Stationary Source
Location ปล่อง HRSG 11
Measurement Date May 20, 2025

Stack Description

Ambient Temperature	33.4	°C	Diameter	3.00	m	Oxygen	13.78	%
Ambient Pressure	755.2	mmHg	Shape	Circle		Carbon dioxide	3.72	%
Type of Process	Combustion		Stack Temperature	96	°C	Gas Velocity	21.61	m/s
Type of Fuel	Natural Gas		Moisture	9.40	%	Flow Rate	399469	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	10:30 AM - 10:50 AM	13.77	3.72	16.82	32.78	0.20	0.39
2	10:51 AM - 11:11 AM	13.78	3.72	16.88	32.93	0.19	0.37
3	11:12 AM - 11:32 AM	13.79	3.72	16.86	32.98	0.17	0.34
Average (ppm)		13.78	3.72	16.86	32.90	0.19	0.36
Guideline[1/](ppm)				-	60	-	6
Guideline[2/](ppm)				-	120	-	20
Guideline[3/](ppm)				-	120	-	20
Result (mg/Nm^3)				31.71	61.89	0.49	0.95
Emission Rate at Actual O_2 (g/s)				3.5188		0.0542	
Guideline[1/](g/s)				5.33		0.74	
Method				US EPA Method 7E		US EPA Method 6C	

Sampled By : Worawich Tongpoom

Guideline : [1/]Environmental Impact Assessment Report of Gulf JP NK2 Co., Ltd. (Chiller Off)
[2/]Notification of the Ministry of Industry on determining pollution contents in air emissions from power plants, 2024 (B.E. 2567)
[3/]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

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 from without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542350
Date Received :May 22, 2025
Date Reported :Jun 02, 2025
Report Number :3298762-1

Sample Number	2542350-1
Sample Description	Emission from Stationary Source
Location	ปล่อง HRSG 11
Measurement Date	May 20, 2025

Stack Description

Ambient Temperature	33.4	°C	Diameter	3.00	m	Oxygen	13.78	%
Ambient Pressure	755.2	mmHg	Shape	Circle		Carbon dioxide	3.72	%
Type of Process	Combustion		Stack Temperature	96	°C	Gas Velocity	21.61	m/s
Type of Fuel	Natural Gas		Moisture	9.40	%	Flow Rate	399469	Nm3/hr

Run No.	Sampling Time	Oxygen (%)	Carbon Dioxide (%)	Carbon Monoxide (ppm)	
				at Actual O_2	At 7% O_2
1	10:30 AM - 10:50 AM	13.77	3.72	1.01	1.96
2	10:51 AM - 11:11 AM	13.78	3.72	0.94	1.84
3	11:12 AM - 11:32 AM	13.79	3.72	0.86	1.68
Average (ppm)		13.78	3.72	0.94	1.83
Guideline (ppm)				-	690
Result (mg/Nm^3)				1.07	2.09
Emission Rate at Actual O_2 (g/s)				0.1190	
Method				US EPA Method 10	

Sampled By : Worawich Tongpoom
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

TESTING
No.0009

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542353
Date Received : May 22, 2025
Date Reported : May 29, 2025
Report Number: 3298767-1

Sample Number	2542353-1
Sampled Date	May 20, 2025
Sample Description	Emission from Stationary Source
Location	ปล่อง HRSG 11
Date Analysis Commenced	May 23, 2025
Condition of Sample	Extracted into one filter paper placed in plastic petri dish

Stack Description

Ambient Pressure	755	mmHg	Diameter	3.00	m	Oxygen	13.8	%
Ambient Temperature	33.4	°C	Shape	Circle		Carbon Dioxide	3.7	%
Type of Process	Combustion		Stack Temperature	96.3	°C	Gas Velocity	21.6	m/s
Type of Fuel	Natural Gas		Moisture	9.35	%	Flow Rate (Actual O2)	400573	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result at 7 %O_2	Result at 13.8 % O_2	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing										
Total Suspended Particulate	10:30 AM - 11:06 AM	mg/m3	-	0.5	<0.5	<0.5	30	60	U.S. Environmental Protection Agency 40 CFR method 1-5, Appendix A, 2020 (Include sampling)	Bangkok

Guideline :

Guideline (1) Environmental Impact Assessment Report of Gulf JK NK2 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

Orawan Rakyong
Scientist (3)
ทะเบียนเลขที่ ว-204-จ-0027

Approved by

Kanokkorn Anek
Assistant General Manager
ทะเบียนเลขที่ ว-204-ค-0004

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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Analysis / Test Report

TESTING
No.0009

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542353
Date Received : May 22, 2025
Date Reported : May 29, 2025
Report Number: 3298767-1

Sample Number	2542353-1
Sampled Date	May 20, 2025
Sample Description	Emission from Stationary Source
Location	ปล่อง HRSG 11
Date Analysis Commenced	May 23, 2025
Condition of Sample	Extracted into one filter paper placed in plastic petri dish

Stack Description

Ambient Pressure	755	mmHg	Diameter	3.00	m	Oxygen	13.8	%
Ambient Temperature	33.4	°C	Shape	Circle		Carbon Dioxide	3.7	%
Type of Process	Combustion		Stack Temperature	96.3	°C	Gas Velocity	21.6	m/s
Type of Fuel	Natural Gas		Moisture	9.35	%	Flow Rate (Actual O2)	400573	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result Emission Rate	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Total Suspended Particulate *	10:30 AM - 11:06 AM	g/s	-	-	<0.06	1.42	-	Calculated	Bangkok

Guideline :

Guideline (1) Environmental Impact Assessment Report of Gulf JK NK2 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 : AnechaTansamai ทะเบียนเลขที่ ว-204-จ-0112

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

Orawan Rakyong
Scientist (3)
ทะเบียนเลขที่ ว-204-จ-0027

Approved by

Kanokkorn Anek
Assistant General Manager
ทะเบียนเลขที่ ว-204-ค-0004

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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Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542351
Date Received :May 22, 2025
Date Reported :Jun 02, 2025
Report Number :3298760-1

Sample Number 2542351-1
Sample Description Emission from Stationary Source
Location ปล่อง HRSG 12
Measurement Date May 21, 2025

Stack Description

Ambient Temperature	32.2	°C	Diameter	3.00	m	Oxygen	13.57	%
Ambient Pressure	755.2	mmHg	Shape	Circle		Carbon dioxide	3.84	%
Type of Process	Combustion		Stack Temperature	98	°C	Gas Velocity	21.46	m/s
Type of Fuel	Natural Gas		Moisture	8.71	%	Flow Rate	398541	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	10:30 AM - 10:50 AM	13.60	3.83	20.70	39.41	0.16	0.31
2	10:51 AM - 11:11 AM	13.57	3.84	20.55	38.97	0.16	0.30
3	11:12 AM - 11:32 AM	13.54	3.86	17.97	33.94	0.14	0.26
Average (ppm)		13.57	3.84	19.74	37.44	0.15	0.29
Guideline[1/](ppm)				-	60	-	6
Guideline[2/](ppm)				-	120	-	20
Guideline[3/](ppm)				-	120	-	20
Result (mg/Nm^3)				37.14	70.44	0.40	0.76
Emission Rate at Actual O_2 (g/s)				4.1116		0.0445	
Guideline[1/](g/s)				5.77		0.80	
Method				US EPA Method 7E		US EPA Method 6C	

Sampled By : Worawich Tongpoom

Guideline : [1/]Environmental Impact Assessment Report of Gulf JP NK2 Co., Ltd. (Chiller On)
[2/]Notification of the Ministry of Industry on determining pollution contents in air emissions from power plants, 2024 (B.E. 2567)
[3/]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 JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542351
Date Received :May 22, 2025
Date Reported :Jun 02, 2025
Report Number :3298760-1

Sample Number	2542351-1
Sample Description	Emission from Stationary Source
Location	ปล่อง HRSG 12
Measurement Date	May 21, 2025

Stack Description

Ambient Temperature	32.2	°C	Diameter	3.00	m	Oxygen	13.57	%
Ambient Pressure	755.2	mmHg	Shape	Circle		Carbon dioxide	3.84	%
Type of Process	Combustion		Stack Temperature	98	°C	Gas Velocity	21.46	m/s
Type of Fuel	Natural Gas		Moisture	8.71	%	Flow Rate	398541	Nm3/hr

Run No.	Sampling Time	Oxygen (%)	Carbon Dioxide (%)	Carbon Monoxide (ppm)	
				at Actual O_2	At 7% O_2
1	10:30 AM - 10:50 AM	13.60	3.83	1.03	1.97
2	10:51 AM - 11:11 AM	13.57	3.84	0.97	1.83
3	11:12 AM - 11:32 AM	13.54	3.86	0.91	1.72
Average (ppm)		13.57	3.84	0.97	1.84
Guideline (ppm)				-	690
Result (mg/Nm^3)				1.11	2.11
Emission Rate at Actual O_2 (g/s)				0.1230	
Method				US EPA Method 10	

Sampled By : Worawich Tongpoom
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

TESTING
No.0009

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542354
Date Received : May 22, 2025
Date Reported : Jun 02, 2025
Report Number: 3298765-1 Rev. No.1

Sample Number	2542354-1
Sampled Date	May 21, 2025
Sample Description	Emission from Stationary Source
Location	ปล่อง HRSG 12
Date Analysis Commenced	May 23, 2025
Condition of Sample	Extracted into one filter paper placed in plastic petri dish

Stack Description

Ambient Pressure	756	mmHg	Diameter	3.00	m	Oxygen	13.6	%
Ambient Temperature	32.2	°C	Shape	Circle		Carbon Dioxide	3.8	%
Type of Process	Combustion		Stack Temperature	97.5	°C	Gas Velocity	21.5	m/s
Type of Fuel	Natural Gas		Moisture	8.66	%	Flow Rate (Actual O2)	399367	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result at 7 %O_2	Result at 13.6 % O_2	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing										
Total Suspended Particulate	10:30 AM - 11:06 AM	mg/m3	-	0.5	<0.5	<0.5	30	60	U.S. Environmental Protection Agency 40 CFR method 1-5, Appendix A, 2020 (Include sampling)	Bangkok

Guideline :

Guideline (1) Environmental Impact Assessment Report of Gulf JK NK2 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

Orawan Rakyong
Scientist (3)
ทะเบียนเลขที่ ว-204-จ-0027

Approved by

Kanokkorn Anek
Assistant General Manager
ทะเบียนเลขที่ ว-204-ค-0004

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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Analysis / Test Report

TESTING
No.0009

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542354
Date Received : May 22, 2025
Date Reported : Jun 02, 2025
Report Number: 3298765-1 Rev. No.1

Sample Number	2542354-1
Sampled Date	May 21, 2025
Sample Description	Emission from Stationary Source
Location	ปล่อง HRSG 12
Date Analysis Commenced	May 23, 2025
Condition of Sample	Extracted into one filter paper placed in plastic petri dish

Stack Description

Ambient Pressure	756	mmHg	Diameter	3.00	m	Oxygen	13.6	%
Ambient Temperature	32.2	°C	Shape	Circle		Carbon Dioxide	3.8	%
Type of Process	Combustion		Stack Temperature	97.5	°C	Gas Velocity	21.5	m/s
Type of Fuel	Natural Gas		Moisture	8.66	%	Flow Rate (Actual O2)	399367	Nm3/hr

Analyte	Sampled Time	Unit	LOD	LOQ (LOR)	Result Emission Rate	Guideline (1)	Guideline (2)	Method	Testing Location
Air Testing									
Total Suspended Particulate *	10:30 AM - 11:06 AM	g/s	-	-	<0.06	1.53	-	Calculated	Bangkok

Guideline :
Guideline (1) Environmental Impact Assessment Report of Gulf JK NK2 Co., Ltd.
Guideline (2) Notification of the Ministry of Natural Resources and Environment, 2023 (B.E. 2566) on Emission Standard from Power Plants.

Note:
This Analysis test report is reissued to supersede report No.3298765-1, Date Reported : May 29, 2025 due to revise guideline/specification

Sampling By : AnechaTansamai ทะเบียนเลขที่ ว-204-จ-0112

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
Orawan Rakyong
Scientist (3)
ทะเบียนเลขที่ ว-204-จ-0027

Approved by
Kanokkorn Anek
Assistant General Manager
ทะเบียนเลขที่ ว-204-ค-0004

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การตรวจสอบความถูกต้องของ CEMs (Rata และ RRA)

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542343
Date Received :May 22, 2025
Date Reported :Jun 23, 2025
Report Number :3298750-1

Sample Number	2542343-1
Sampled Date	May 20, 2025
Sample Description	Emission from Stationary Source
Location	ปล่อง HRSG 11
Parameter	NOx

Relative Accuracy Test Audit Report

Run No.	Date	Time		Raw Data at Actual O2		Corrected Value at 7% O2		Difference
		Start	Stop	CEMs (ppm)	RM (ppm)	CEMs (ppm)	RM (ppm)	
1	20 May 25	10:30	10:50	16.19	16.82	33.53	32.78	-0.75
2	20 May 25	10:51	11:11	16.12	16.88	33.36	32.93	-0.43
3	20 May 25	11:12	11:32	16.01	16.86	33.17	32.98	-0.18
4	20 May 25	11:33	11:53	16.77	17.57	34.85	34.46	-0.38
5	20 May 25	11:54	12:14	16.41	17.49	34.08	34.43	0.34
6	20 May 25	12:15	12:35	15.09	15.91	31.24	31.05	-0.19
7*	20 May 25	12:36	12:56	14.54	14.98	30.10	29.31	-0.79
8*	20 May 25	12:57	13:17	15.60	15.77	32.29	30.88	-1.41
9*	20 May 25	13:18	13:38	17.16	17.63	35.68	34.58	-1.10
10	20 May 25	13:39	13:59	16.69	17.55	34.70	34.49	-0.21
11	20 May 25	14:00	14:20	17.43	18.26	36.27	35.90	-0.37
12	20 May 25	14:21	14:41	17.42	18.38	36.22	36.20	-0.02
	Average					34.16	33.91	-0.25
	Confidence Coefficient (CC)							0.23
	Relative Accuracy (Compared with RM) (%)							1.41
	Relative Accuracy Criteria 1/ (Compared with RM)							≤ 20%

Reference Method : US EPA Method 7E

Remark: * Sample with * is a rejected data

1/ Relative Accuracy Criteria of NOx is refer to 40 CFR Part 60 Appendix B : Performance Specification Test 2 (PS-2)

RA Result is within Criteria

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 JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542343
Date Received :May 22, 2025
Date Reported :Jun 23, 2025
Report Number :3298750-1

Sample Number	2542343-1
Sampled Date	May 20, 2025
Sample Description	Emission from Stationary Source
Location	ปล่อง HRSG 11
Parameter	CO

Relative Accuracy Test Audit Report

Run No.	Date	Time		Raw Data at Actual O2		Corrected Value at 7% O2		Difference
		Start	Stop	CEMs (ppm)	RM (ppm)	CEMs (ppm)	RM (ppm)	
1	20 May 25	10:30	10:50	3.50	1.01	7.25	1.96	-5.29
2	20 May 25	10:51	11:11	3.52	0.94	7.28	1.84	-5.45
3	20 May 25	11:12	11:32	3.51	0.86	7.27	1.68	-5.58
4*	20 May 25	11:33	11:53	3.52	0.79	7.31	1.56	-5.76
5*	20 May 25	11:54	12:14	3.53	0.77	7.34	1.51	-5.83
6*	20 May 25	12:15	12:35	3.51	0.82	7.27	1.60	-5.67
7	20 May 25	12:36	12:56	3.52	0.83	7.29	1.62	-5.66
8	20 May 25	12:57	13:17	3.52	1.08	7.29	2.12	-5.17
9	20 May 25	13:18	13:38	3.57	0.99	7.42	1.94	-5.48
10	20 May 25	13:39	13:59	3.56	0.96	7.41	1.89	-5.52
11	20 May 25	14:00	14:20	3.57	0.93	7.42	1.82	-5.60
12	20 May 25	14:21	14:41	3.56	1.03	7.40	2.02	-5.39
	Average					7.34	1.88	-5.46
	Confidence Coefficient (CC)							0.12
	Relative Accuracy (Compared with Emission Standard : 690 ppm) (%)							0.81
	Relative Accuracy Criteria [1/] (Compared with Emission Standard)							≤ 5%

Reference Method : US EPA Method 10

Remark: * Sample with * is a rejected data

[1/] Relative Accuracy Criteria of CO is refer to 40 CFR Part 60 Appendix B : Performance Specification Test 4 (PS-4) compared with Emission Standard 690 ppm at 7%O2

RA Result is within Criteria

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 JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542343
Date Received :May 22, 2025
Date Reported :Jun 23, 2025
Report Number :3298750-1

Sample Number	2542343-1
Sampled Date	May 20, 2025
Sample Description	Emission from Stationary Source
Location	ปล่อง HRSG 11
Parameter	O2

Relative Accuracy Test Audit Report

Run No.	Date	Time		Raw Data at Actual		Difference
		Start	Stop	CEMs (%)	RM (%)	
1*	20 May 25	10:30	10:50	14.19	13.77	-0.42
2*	20 May 25	10:51	11:11	14.18	13.78	-0.41
3	20 May 25	11:12	11:32	14.19	13.79	-0.40
4	20 May 25	11:33	11:53	14.21	13.81	-0.40
5	20 May 25	11:54	12:14	14.21	13.84	-0.37
6*	20 May 25	12:15	12:35	14.19	13.78	-0.41
7	20 May 25	12:36	12:56	14.19	13.79	-0.39
8	20 May 25	12:57	13:17	14.18	13.80	-0.38
9	20 May 25	13:18	13:38	14.21	13.81	-0.40
10	20 May 25	13:39	13:59	14.22	13.83	-0.39
11	20 May 25	14:00	14:20	14.22	13.83	-0.39
12	20 May 25	14:21	14:41	14.21	13.84	-0.37
	Average			14.20	13.82	-0.39
	Confidence Coefficient (CC)					-
	Relative Accuracy (Compared in Actual) (%)					0.39
	Relative Accuracy Criteria [1/] (%)					≤ 1%

Reference Method : US EPA Method 3A

Remark: * Sample with * is a rejected data

[1/] Relative Accuracy Criteria of O2 is refer to 40 CFR Part 60 Appendix B : Performance Specification Test 3 (PS-3)

RA Result is within Criteria

Sampled By : Worawich Tongpoom

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 JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140

P/O : 4109004464

Project Name : Monitoring EIA

Project Location : GNK2

Lot ID: 2542346

Date Received: May 22, 2025

Date Reported: Jun 23, 2025

Report Number: 3316117-1

Sample Number	2542346-1
Sampled Date	May 20, 2025
Sample Description	Emission from Stationary Source
Location	ปล่อง HRSG 11
Parameter	Relative Response Audit

Relative Response Audit Test Report

No Sample	Date	Time		CEMS Values		RM Values	Allowable Range		Criterion
		Start	Stop	(%Opacity)	(mg/m³ at 7%O_2)	(mg/m³ at 7%O_2)	Minimum	Maximum	
1	20-May-25	10:30	11:06	0.15	1.69	0.37	-5.81	9.19	Pass
2	20-May-25	11:10	11:46	0.15	1.67	0.18	-5.83	9.17	Pass
3	20-May-25	11:55	12:31	0.14	1.61	0.18	-5.89	9.11	Pass
4	20-May-25	12:35	13:11	0.13	1.47	0.36	-6.03	8.97	Pass
5	20-May-25	13:15	13:51	0.15	1.66	0.18	-5.84	9.16	Pass

Remark : - Relative Response Audit is refer to 40 CFR Part 60 Appendix B : Performance Specification 11 : Specifications and Test Procedures for Particulate Matter Continuous Emission Monitoring Systems at Stationary Source (PS-11)

- Correlation Equation of Linear curve Y = 5.4575X
- Emission limit 30 mg/m3 from Environmental Impact Assessment Report of Gulf JP NK2 Co., Ltd.

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 JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140

P/O : 4109004464

Project Name : Monitoring EIA

Project Location : GNK2

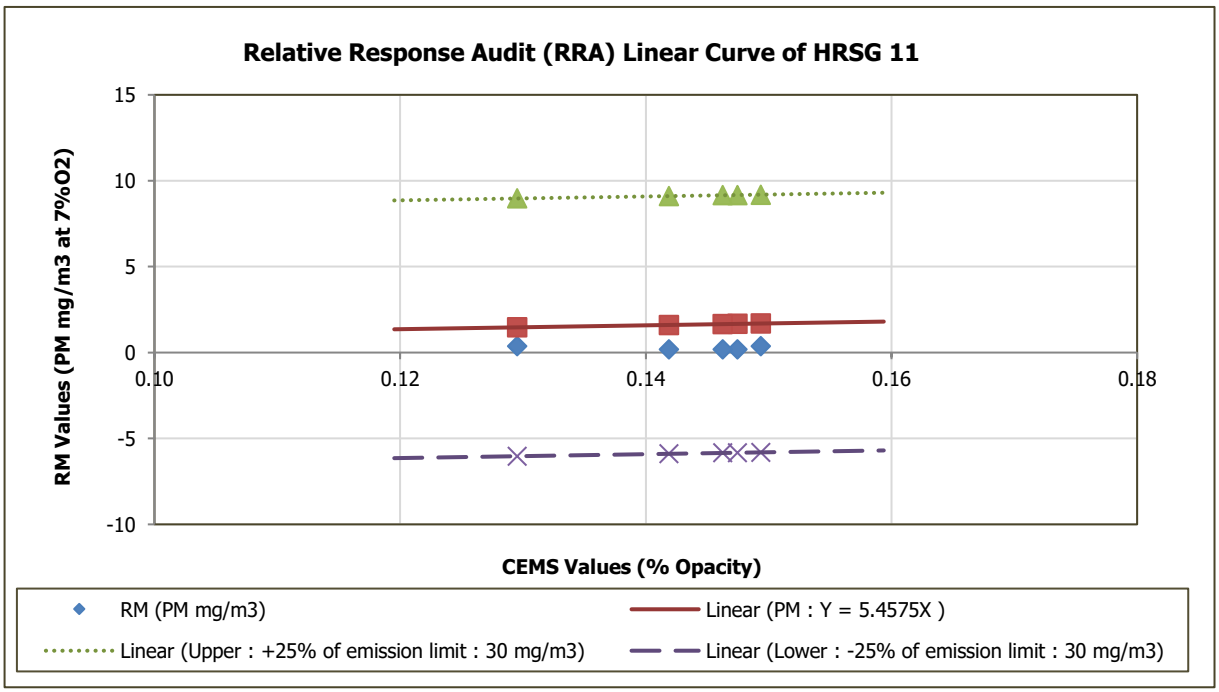
Lot ID: 2542346

Date Received: May 22, 2025

Date Reported: Jun 23, 2025

Report Number: 3316117-1

Sample Number	2542346-1
Sampled Date	May 20, 2025
Sample Description	Emission from Stationary Source
Location	ปล่อง HRSG 11
Parameter	Relative Response Audit



Sampled By : Anecha Tansamai

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 JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2547743
Date Received :May 22, 2025
Date Reported :Jun 23, 2025
Report Number :3316115-1

Sample Number	2547743-1
Sampled Date	May 20, 2025
Sample Description	Emission from Stationary Source
Location	ปล่อง HRSG 11
Parameter	Flowrate

Relative Accuracy Test Audit Report

Run No.	Date	Time		Flowrate Data		Difference
		Start	Stop	CEMs (Nm3/Hr)	RM (Nm3/Hr)	
1	20 May 25	10:30	11:06	423,254	400,573	-22,681
2	20 May 25	11:10	11:46	419,132	401,784	-17,348
3	20 May 25	11:55	12:31	371,876	396,647	24,771
4*	20 May 25	12:35	13:11	320,481	408,325	87,844
5	20 May 25	13:15	13:51	420,714	403,950	-16,764
6	20 May 25	14:00	14:20	431,600	406,450	-25,150
7	20 May 25	14:21	14:41	427,995	410,727	-17,268
8	20 May 25	14:42	15:02	430,862	407,673	-23,189
9*	20 May 25	15:03	15:23	431,176	387,388	-43,788
10	20 May 25	15:24	15:44	430,414	396,635	-33,779
11	20 May 25	15:45	16:05	430,648	395,770	-34,878
12*	20 May 25	16:06	16:26	430,000	390,336	-39,664
	Average			420,722	402,245	-18,476
	Confidence Coefficient (CC)					13,489
	Relative Accuracy [1/] (Compared with RM) (%)					7.95
	Relative Accuracy Criteria (Compared with RM)					≤ 20 %

Reference Method : US EPA Method 2

Remark: * Sample with * is a rejected data

[1/] Relative Accuracy Criteria of Flowrate is refer to 40 CFR Part 60 Appendix B : Performance Specification Test 6 (PS-6)

RA Result is within Criteria

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 JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2547743
Date Received :May 22, 2025
Date Reported :Jun 23, 2025
Report Number :3316115-1

Sample Number	2547743-1
Sampled Date	May 20, 2025
Sample Description	Emission from Stationary Source
Location	ปล่อง HRSG 11
Parameter	Stack Temperature

Relative Accuracy Test Audit Report

Run No.	Date	Time		Temperature Data		Difference
		Start	Stop	CEMs (°C)	RM (°C)	
1	20 May 25	10:30	11:06	95.9	96.3	0.4
2	20 May 25	11:10	11:46	95.6	94.5	-1.1
3	20 May 25	11:55	12:31	95.0	94.8	-0.2
4*	20 May 25	12:35	13:11	90.2	95.3	5.1
5	20 May 25	13:15	13:51	93.6	94.7	1.0
6	20 May 25	14:00	14:20	95.8	94.6	-1.2
7*	20 May 25	14:21	14:41	96.0	94.7	-1.3
8*	20 May 25	14:42	15:02	96.0	94.7	-1.4
9	20 May 25	15:03	15:23	95.8	94.8	-1.1
10	20 May 25	15:24	15:44	95.8	94.8	-1.0
11	20 May 25	15:45	16:05	95.8	94.8	-1.0
12	20 May 25	16:06	16:26	95.7	94.8	-0.9
	Average			95.5	94.9	-0.6
	Confidence Coefficient (CC)					0.6
	Relative Accuracy [1/] (Compared with RM) (%)					1.2
	Relative Accuracy Criteria (Compared with RM)					≤ 20 %

Reference Method : US EPA Method 2

Remark: * Sample with * is a rejected data

[1/] Relative Accuracy Criteria of Stack Temperature is refer to 40 CFR Part 60 Appendix B : Performance Specification Test 6 (PS-6)

RA Result is within Criteria

Sampled By : Anecha Tansamai

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 JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542344
Date Received :May 22, 2025
Date Reported :Jun 23, 2025
Report Number :3298747-1

Sample Number	2542344-1
Sampled Date	May 21, 2025
Sample Description	Emission from Stationary Source
Location	ปล่อง HRSG 12
Parameter	NOx

Relative Accuracy Test Audit Report

Run No.	Date	Time		Raw Data at Actual O2		Corrected Value at 7% O2		Difference
		Start	Stop	CEMs (ppm)	RM (ppm)	CEMs (ppm)	RM (ppm)	
1*	21 May 25	10:30	10:50	18.85	20.70	37.63	39.41	1.78
2	21 May 25	10:51	11:11	18.96	20.55	37.90	38.97	1.08
3	21 May 25	11:12	11:32	16.70	17.97	33.26	33.94	0.68
4	21 May 25	11:33	11:53	16.70	17.34	33.27	32.74	-0.53
5	21 May 25	11:54	12:14	16.67	17.42	33.23	33.04	-0.19
6	21 May 25	12:15	12:35	18.58	19.08	36.84	36.02	-0.83
7*	21 May 25	12:36	12:56	19.31	20.97	38.43	39.68	1.24
8*	21 May 25	12:57	13:17	18.91	21.27	37.81	40.45	2.64
9	21 May 25	13:18	13:38	17.16	17.73	34.28	33.78	-0.50
10	21 May 25	13:39	13:59	17.01	17.96	33.99	34.15	0.15
11	21 May 25	14:00	14:20	16.92	17.77	33.81	33.88	0.07
12	21 May 25	14:21	14:41	16.89	17.77	33.76	33.91	0.14
	Average					34.48	34.49	0.01
	Confidence Coefficient (CC)							0.46
	Relative Accuracy (Compared with RM) (%)							1.37
	Relative Accuracy Criteria 1/ (Compared with RM)							≤ 20%

Reference Method : US EPA Method 7E

Remark: * Sample with * is a rejected data

1/ Relative Accuracy Criteria of NOx is refer to 40 CFR Part 60 Appendix B : Performance Specification Test 2 (PS-2)

RA Result is within Criteria

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 JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542344
Date Received :May 22, 2025
Date Reported :Jun 23, 2025
Report Number :3298747-1

Sample Number	2542344-1
Sampled Date	May 21, 2025
Sample Description	Emission from Stationary Source
Location	ปล่อง HRSG 12
Parameter	CO

Relative Accuracy Test Audit Report

Run No.	Date	Time		Raw Data at Actual O2		Corrected Value at 7% O2		Difference
		Start	Stop	CEMs (ppm)	RM (ppm)	CEMs (ppm)	RM (ppm)	
1	21 May 25	10:30	10:50	1.10	1.03	2.21	1.97	-0.24
2	21 May 25	10:51	11:11	1.11	0.97	2.22	1.83	-0.38
3	21 May 25	11:12	11:32	1.05	0.91	2.09	1.72	-0.36
4	21 May 25	11:33	11:53	1.03	0.91	2.05	1.72	-0.33
5	21 May 25	11:54	12:14	1.07	0.88	2.14	1.67	-0.47
6*	21 May 25	12:15	12:35	1.10	0.89	2.19	1.68	-0.51
7	21 May 25	12:36	12:56	1.01	0.85	2.02	1.61	-0.41
8*	21 May 25	12:57	13:17	1.01	0.82	2.03	1.55	-0.47
9	21 May 25	13:18	13:38	1.05	0.85	2.09	1.62	-0.47
10	21 May 25	13:39	13:59	1.06	0.89	2.12	1.69	-0.43
11	21 May 25	14:00	14:20	1.05	0.86	2.09	1.63	-0.46
12*	21 May 25	14:21	14:41	1.05	0.83	2.09	1.59	-0.50
	Average					2.11	1.72	-0.39
	Confidence Coefficient (CC)							0.06
	Relative Accuracy (Compared with Emission Standard : 690 ppm) (%)							0.07
	Relative Accuracy Criteria 1/ (Compared with Emission Standard)							≤ 5%

Reference Method : US EPA Method 10

Remark: * Sample with * is a rejected data

1/ Relative Accuracy Criteria of CO is refer to 40 CFR Part 60 Appendix B : Performance Specification Test 4 (PS-4) compared with Emission Standard 690 ppm at 7%O2

RA Result is within Criteria

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 JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542344
Date Received :May 22, 2025
Date Reported :Jun 23, 2025
Report Number :3298747-1

Sample Number	2542344-1
Sampled Date	May 21, 2025
Sample Description	Emission from Stationary Source
Location	ปล่อง HRSG 12
Parameter	O2

Relative Accuracy Test Audit Report

Run No.	Date	Time		Raw Data at Actual		Difference
		Start	Stop	CEMs (%)	RM (%)	
1	21 May 25	10:30	10:50	13.94	13.60	-0.34
2*	21 May 25	10:51	11:11	13.94	13.57	-0.38
3*	21 May 25	11:12	11:32	13.92	13.54	-0.38
4*	21 May 25	11:33	11:53	13.93	13.54	-0.39
5	21 May 25	11:54	12:14	13.93	13.57	-0.36
6	21 May 25	12:15	12:35	13.89	13.54	-0.35
7	21 May 25	12:36	12:56	13.91	13.55	-0.36
8	21 May 25	12:57	13:17	13.95	13.59	-0.36
9	21 May 25	13:18	13:38	13.94	13.61	-0.34
10	21 May 25	13:39	13:59	13.94	13.59	-0.35
11	21 May 25	14:00	14:20	13.94	13.61	-0.33
12	21 May 25	14:21	14:41	13.95	13.62	-0.33
	Average			13.93	13.59	-0.35
	Confidence Coefficient (CC)					-
	Relative Accuracy (Compared in Actual) (%)					0.35
	Relative Accuracy Criteria [1/] (%)					≤ 1%

Reference Method : US EPA Method 3A

Remark: * Sample with * is a rejected data

[1/] Relative Accuracy Criteria of O2 is refer to 40 CFR Part 60 Appendix B : Performance Specification Test 3 (PS-3)

RA Result is within Criteria

Sampled By : Worawich Tongpoom

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 JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140

P/O : 4109004464

Project Name : Monitoring EIA

Project Location : GNK2

Lot ID: 2542347

Date Received: May 22, 2025

Date Reported: Jun 23, 2025

Report Number: 3316116-1

Sample Number	2542347-1
Sampled Date	May 21, 2025
Sample Description	Emission from Stationary Source
Location	ปล่อง HRSG 12
Parameter	Relative Response Audit

Relative Response Audit Test Report

No Sample	Date	Time		CEMS Values		RM Values	Allowable Range		Criterion
		Start	Stop	(%Opacity)	(mg/m^3 at 7%O_2)	(mg/m^3 at 7%O_2)	Minimum	Maximum	
1	21-May-25	10:30	11:06	0.64	4.17	0.92	-3.33	11.67	Pass
2	21-May-25	12:30	13:06	0.58	3.72	0.92	-3.78	11.22	Pass
3	21-May-25	13:40	14:16	0.58	3.78	0.18	-3.72	11.28	Pass
4	21-May-25	14:20	14:56	0.59	3.80	0.37	-3.70	11.30	Pass
5	21-May-25	15:00	15:36	0.59	3.83	0.37	-3.67	11.33	Pass

Remark : - Relative Response Audit is refer to 40 CFR Part 60 Appendix B : Performance Specification 11 : Specifications and Test Procedures for Particulate Matter Continuous Emission Monitoring Systems at Stationary Source (PS-11)

- Correlation Equation of Linear curve Y=3.2403X
- Emission limit 30 mg/m3 from Environmental Impact Assessment Report of Gulf JP NK2 Co., Ltd.

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 JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140

P/O : 4109004464

Project Name : Monitoring EIA

Project Location : GNK2

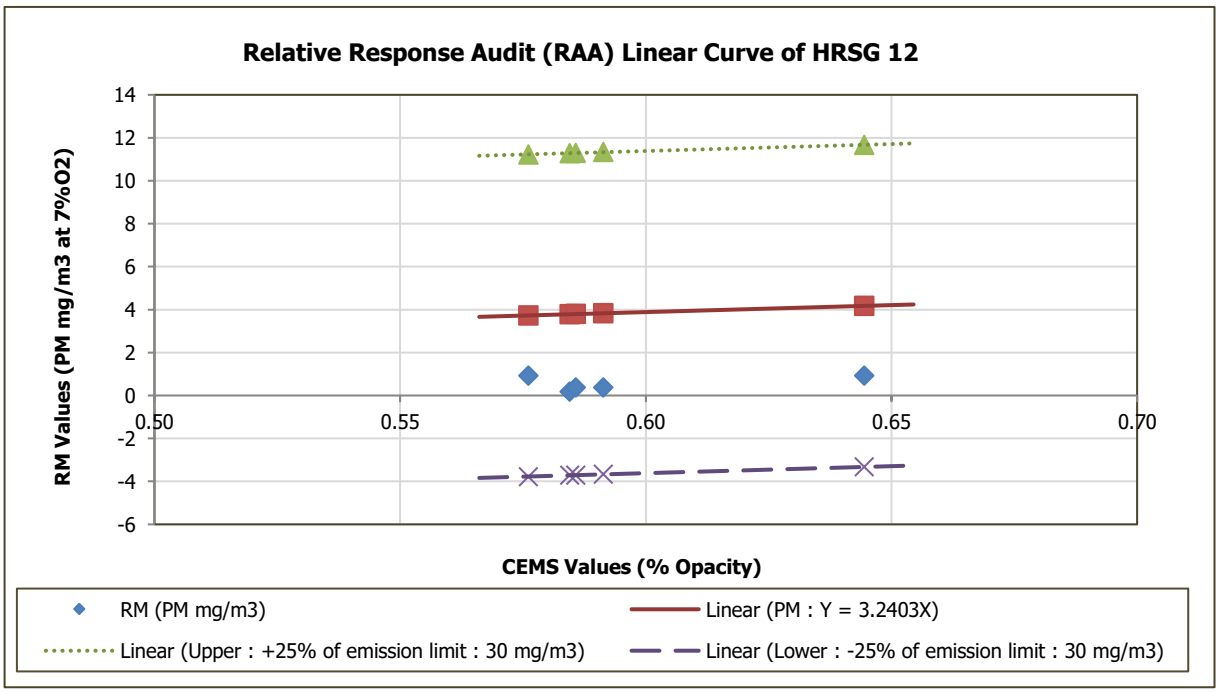
Lot ID: 2542347

Date Received: May 22, 2025

Date Reported: Jun 23, 2025

Report Number: 3316116-1

Sample Number	2542347-1
Sampled Date	May 21, 2025
Sample Description	Emission from Stationary Source
Location	ปล่อง HRSG 12
Parameter	Relative Response Audit



Sampled By : Anecha Tansamai

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 JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2547744
Date Received :May 22, 2025
Date Reported :Jun 23, 2025
Report Number :3316114-1

Sample Number	2547744-1
Sampled Date	May 21, 2025
Sample Description	Emission from Stationary Source
Location	ปล่อง HRSG 12
Parameter	Flowrate

Relative Accuracy Test Audit Report

Run No.	Date	Time		Flowrate Data		Difference
		Start	Stop	CEMs (Nm3/Hr)	RM (Nm3/Hr)	
1*	21 May 25	10:30	11:06	442,097	399,367	-42,730
2	21 May 25	12:30	13:06	337,086	315,813	-21,273
3*	21 May 25	13:40	14:16	425,257	397,625	-27,632
4*	21 May 25	14:20	14:56	425,178	399,210	-25,968
5	21 May 25	15:00	15:36	425,741	400,766	-24,975
6	21 May 25	15:40	16:00	424,381	417,756	-6,625
7	21 May 25	16:01	16:21	424,105	417,024	-7,081
8	21 May 25	16:22	16:42	423,810	414,684	-9,126
9	21 May 25	16:43	17:03	424,024	403,478	-20,546
10	21 May 25	17:04	17:24	423,638	398,245	-25,393
11	21 May 25	17:25	17:45	422,681	401,474	-21,207
12	21 May 25	17:46	18:06	424,124	409,407	-14,717
	Average			414,399	397,627	-16,771
	Confidence Coefficient (CC)					5,799
	Relative Accuracy 1/ (Compared with RM) (%)					5.68
	Relative Accuracy Criteria (Compared with RM)					≤ 20 %

Reference Method : US EPA Method 2

Remark: * Sample with * is a rejected data

1/ Relative Accuracy Criteria of Flowrate is refer to 40 CFR Part 60 Appendix B : Performance Specification Test 6 (PS-6)

RA Result is within Criteria

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 JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2547744
Date Received :May 22, 2025
Date Reported :Jun 23, 2025
Report Number :3316114-1

Sample Number	2547744-1
Sampled Date	May 21, 2025
Sample Description	Emission from Stationary Source
Location	ปล่อง HRSG 12
Parameter	Stack Temperature

Relative Accuracy Test Audit Report

Run No.	Date	Time		Temperature Data		Difference
		Start	Stop	CEMs (°C)	RM (°C)	
1	21 May 25	10:30	11:06	97.6	97.5	-0.1
2	21 May 25	12:30	13:06	90.7	90.5	-0.2
3*	21 May 25	13:40	14:16	95.6	97.3	1.8
4	21 May 25	14:20	14:56	96.1	96.5	0.4
5	21 May 25	15:00	15:36	96.2	96.5	0.3
6	21 May 25	15:40	16:00	96.2	95.4	-0.8
7*	21 May 25	16:01	16:21	96.3	94.8	-1.4
8*	21 May 25	16:22	16:42	96.3	95.3	-1.0
9	21 May 25	16:43	17:03	96.2	95.5	-0.7
10	21 May 25	17:04	17:24	96.2	95.8	-0.4
11	21 May 25	17:25	17:45	96.0	95.4	-0.6
12	21 May 25	17:46	18:06	96.0	95.6	-0.4
	Average			95.7	95.4	-0.3
	Confidence Coefficient (CC)					0.3
	Relative Accuracy [1/] (Compared with RM) (%)					0.6
	Relative Accuracy Criteria (Compared with RM)					≤ 20 %

Reference Method : US EPA Method 2

Remark: * Sample with * is a rejected data

[1/] Relative Accuracy Criteria of Stack Temperature is refer to 40 CFR Part 60 Appendix B : Performance Specification Test 6 (PS-6)

RA Result is within Criteria

Sampled By : Anecha Tansamai

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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ภาคผนวก ค-3

ระดับเสียงโดยทั่วไป

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542341
Date Received : May 26, 2025
Date Reported : Jun 04, 2025
Report Number: 3323354-1

Sample Number	2542341-1
Parameter	Noise (Leq 24 hrs.)
Location	บ้านโคกเชือก (GPS 47P 0697994, 1588673)
Measurement Date	May 16 - May 17, 2025
Measurement by	Vanich Phanpipit
Sound Level meter	Serial No. 858525

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	50.9	81.0	40.9
12:00 PM - 01:00 PM	49.4	71.7	41.2
01:00 PM - 02:00 PM	48.8	72.1	42.2
02:00 PM - 03:00 PM	52.4	80.0	42.3
03:00 PM - 04:00 PM	54.5	79.2	42.7
04:00 PM - 05:00 PM	60.5	90.3	47.6
05:00 PM - 06:00 PM	65.4	102.6	45.9
06:00 PM - 07:00 PM	57.4	84.2	45.7
07:00 PM - 08:00 PM	51.1	67.9	47.4
08:00 PM - 09:00 PM	53.6	79.3	49.4
09:00 PM - 10:00 PM	52.3	62.4	49.5
10:00 PM - 11:00 PM	49.3	67.6	47.9
11:00 PM - 12:00 AM	48.7	69.9	46.1
12:00 AM - 01:00 AM	47.5	68.3	46.0
01:00 AM - 02:00 AM	47.3	59.1	46.0
02:00 AM - 03:00 AM	47.6	62.2	45.6
03:00 AM - 04:00 AM	47.6	62.7	45.6
04:00 AM - 05:00 AM	50.2	71.8	47.5
05:00 AM - 06:00 AM	55.1	79.7	48.7
06:00 AM - 07:00 AM	54.1	74.5	46.5
07:00 AM - 08:00 AM	56.1	88.6	45.5
08:00 AM - 09:00 AM	53.8	79.5	43.4
09:00 AM - 10:00 AM	51.7	73.0	44.1
10:00 AM - 11:00 AM	55.7	81.1	43.0
Leq Average 24 hrs. (dB(A))	55.6		
Lmax (dB(A))		102.6	
L90 (dB(A))			45.7
Ldn (dB(A))	58.8		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Technical Management
Saranya C.
Saranya Chalermthamrong
Scientist (4)

Approved by
Supot S.
Supot Salamteh
Section Head

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542341
Date Received : May 26, 2025
Date Reported : Jun 04, 2025
Report Number: 3323355-1

Sample Number	2542341-2
Parameter	Noise (Leq 24 hrs.)
Location	บ้านโคกเชือก (GPS 47P 0697994, 1588673)
Measurement Date	May 17 - May 18, 2025
Measurement by	Vanich Phanpipit
Sound Level meter	Serial No. 858525

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	54.0	82.3	42.2
12:00 PM - 01:00 PM	54.3	79.8	41.2
01:00 PM - 02:00 PM	56.3	78.7	43.9
02:00 PM - 03:00 PM	61.0	91.2	45.0
03:00 PM - 04:00 PM	62.3	94.5	46.1
04:00 PM - 05:00 PM	56.6	79.4	46.3
05:00 PM - 06:00 PM	56.6	83.8	46.5
06:00 PM - 07:00 PM	56.9	75.5	47.4
07:00 PM - 08:00 PM	57.3	79.9	50.9
08:00 PM - 09:00 PM	51.6	76.3	48.7
09:00 PM - 10:00 PM	49.8	59.0	48.7
10:00 PM - 11:00 PM	49.8	61.5	48.5
11:00 PM - 12:00 AM	50.1	64.3	48.5
12:00 AM - 01:00 AM	50.3	66.4	48.9
01:00 AM - 02:00 AM	50.5	61.8	48.2
02:00 AM - 03:00 AM	50.2	65.0	47.7
03:00 AM - 04:00 AM	50.3	68.8	47.9
04:00 AM - 05:00 AM	51.8	74.0	48.5
05:00 AM - 06:00 AM	53.2	74.2	48.5
06:00 AM - 07:00 AM	54.5	76.0	45.5
07:00 AM - 08:00 AM	54.7	82.7	43.3
08:00 AM - 09:00 AM	52.8	82.7	42.0
09:00 AM - 10:00 AM	51.3	83.7	41.1
10:00 AM - 11:00 AM	48.6	76.9	40.3
Leq Average 24 hrs. (dB(A))	55.3		
Lmax (dB(A))		94.5	
L90 (dB(A))			46.5
Ldn (dB(A))	59.1		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Technical Management
Saranya C.
Saranya Chalermthamrong
Scientist (4)

Approved by
Supot S.
Supot Salamteh
Section Head

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542341
Date Received : May 26, 2025
Date Reported : Jun 04, 2025
Report Number: 3323356-1

Sample Number	2542341-3
Parameter	Noise (Leq 24 hrs.)
Location	บ้านโคกเชือก (GPS 47P 0697994, 1588673)
Measurement Date	May 18 - May 19, 2025
Measurement by	Vanich Phanpipit
Sound Level meter	Serial No. 858525

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	50.0	79.6	39.4
12:00 PM - 01:00 PM	46.8	75.5	39.1
01:00 PM - 02:00 PM	49.3	72.0	38.7
02:00 PM - 03:00 PM	47.5	72.2	39.1
03:00 PM - 04:00 PM	49.4	75.0	39.1
04:00 PM - 05:00 PM	51.5	73.2	41.1
05:00 PM - 06:00 PM	53.2	82.4	44.5
06:00 PM - 07:00 PM	52.1	83.3	44.3
07:00 PM - 08:00 PM	56.2	82.5	45.6
08:00 PM - 09:00 PM	54.3	75.7	47.2
09:00 PM - 10:00 PM	54.2	74.8	47.2
10:00 PM - 11:00 PM	51.9	72.2	50.5
11:00 PM - 12:00 AM	49.8	71.9	47.6
12:00 AM - 01:00 AM	47.1	58.8	46.2
01:00 AM - 02:00 AM	46.4	58.2	44.8
02:00 AM - 03:00 AM	45.6	69.7	43.8
03:00 AM - 04:00 AM	45.2	58.0	43.6
04:00 AM - 05:00 AM	46.7	66.9	44.4
05:00 AM - 06:00 AM	49.1	75.7	43.7
06:00 AM - 07:00 AM	52.6	70.2	45.1
07:00 AM - 08:00 AM	53.3	76.6	44.0
08:00 AM - 09:00 AM	49.8	72.7	42.4
09:00 AM - 10:00 AM	48.6	72.8	41.1
10:00 AM - 11:00 AM	48.7	72.5	40.8
Leq Average 24 hrs. (dB(A))	51.0		
Lmax (dB(A))		83.3	
L90 (dB(A))			43.8
Ldn (dB(A))	56.0		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Technical Management
Saranya C.
Saranya Chalermthamrong
Scientist (4)

Approved by
Supot S.
Supot Salamteh
Section Head

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542341
Date Received : May 26, 2025
Date Reported : Jun 04, 2025
Report Number: 3323357-1

Sample Number	2542341-4
Parameter	Noise (Leq 24 hrs.)
Location	บ้านโคกเชือก (GPS 47P 0697994, 1588673)
Measurement Date	May 19 - May 20, 2025
Measurement by	Vanich Phanpipit
Sound Level meter	Serial No. 858525

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	47.2	74.0	40.0
12:00 PM - 01:00 PM	45.3	74.6	37.8
01:00 PM - 02:00 PM	48.5	71.9	39.8
02:00 PM - 03:00 PM	47.0	70.2	39.6
03:00 PM - 04:00 PM	48.6	77.8	39.9
04:00 PM - 05:00 PM	52.9	88.1	41.1
05:00 PM - 06:00 PM	57.9	85.8	46.2
06:00 PM - 07:00 PM	56.0	85.0	46.8
07:00 PM - 08:00 PM	61.4	90.5	46.3
08:00 PM - 09:00 PM	50.6	79.4	45.4
09:00 PM - 10:00 PM	50.3	70.4	47.1
10:00 PM - 11:00 PM	51.3	70.3	44.5
11:00 PM - 12:00 AM	45.7	60.7	44.1
12:00 AM - 01:00 AM	46.1	56.3	45.0
01:00 AM - 02:00 AM	49.1	76.4	45.4
02:00 AM - 03:00 AM	48.9	73.8	45.7
03:00 AM - 04:00 AM	48.1	68.8	47.0
04:00 AM - 05:00 AM	47.5	65.9	45.6
05:00 AM - 06:00 AM	45.7	57.4	44.1
06:00 AM - 07:00 AM	45.4	62.7	44.0
07:00 AM - 08:00 AM	45.1	66.4	43.7
08:00 AM - 09:00 AM	45.0	68.0	42.6
09:00 AM - 10:00 AM	47.1	69.2	44.0
10:00 AM - 11:00 AM	49.3	74.9	44.4
Leq Average 24 hrs. (dB(A))	52.1		
Lmax (dB(A))		90.5	
L90 (dB(A))			44.1
Ldn (dB(A))	55.7		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Technical Management
Saranya C.
Saranya Chalermthamrong
Scientist (4)

Approved by
Supot S.
Supot Salamteh
Section Head

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542341
Date Received : May 26, 2025
Date Reported : Jun 04, 2025
Report Number: 3323358-1

Sample Number	2542341-5
Parameter	Noise (Leq 24 hrs.)
Location	บ้านโคกเชือก (GPS 47P 0697994, 1588673)
Measurement Date	May 20 - May 21, 2025
Measurement by	Vanich Phanpipit
Sound Level meter	Serial No. 858525

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	46.3	72.8	39.4
12:00 PM - 01:00 PM	47.1	69.5	39.5
01:00 PM - 02:00 PM	47.1	67.5	38.8
02:00 PM - 03:00 PM	53.0	83.5	40.8
03:00 PM - 04:00 PM	47.6	75.9	39.4
04:00 PM - 05:00 PM	53.4	76.1	41.7
05:00 PM - 06:00 PM	58.3	86.1	45.4
06:00 PM - 07:00 PM	60.9	82.7	46.6
07:00 PM - 08:00 PM	52.7	75.3	46.0
08:00 PM - 09:00 PM	51.6	71.7	47.8
09:00 PM - 10:00 PM	50.3	70.2	46.9
10:00 PM - 11:00 PM	46.5	62.2	45.2
11:00 PM - 12:00 AM	46.9	64.0	45.6
12:00 AM - 01:00 AM	45.7	61.0	43.8
01:00 AM - 02:00 AM	44.7	56.7	43.2
02:00 AM - 03:00 AM	49.6	77.9	43.1
03:00 AM - 04:00 AM	45.7	64.1	43.5
04:00 AM - 05:00 AM	49.8	80.1	43.7
05:00 AM - 06:00 AM	53.4	75.5	43.8
06:00 AM - 07:00 AM	53.4	78.0	45.2
07:00 AM - 08:00 AM	52.8	74.5	43.6
08:00 AM - 09:00 AM	51.8	79.3	42.1
09:00 AM - 10:00 AM	48.1	67.7	40.8
10:00 AM - 11:00 AM	47.7	70.4	40.4
Leq Average 24 hrs. (dB(A))	52.5		
Lmax (dB(A))		86.1	
L90 (dB(A))			43.5
Ldn (dB(A))	56.9		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Technical Management
Saranya C.
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Scientist (4)

Approved by
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Supot Salamteh
Section Head

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542341
Date Received : May 26, 2025
Date Reported : Jun 04, 2025
Report Number: 3323359-1

Sample Number	2542341-6
Parameter	Noise (Leq 24 hrs.)
Location	บ้านโคกเชือก (GPS 47P 0697994, 1588673)
Measurement Date	May 21 - May 22, 2025
Measurement by	Vanich Phanpipit
Sound Level meter	Serial No. 858525

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	64.0	89.0	48.6
12:00 PM - 01:00 PM	58.7	91.5	46.6
01:00 PM - 02:00 PM	54.7	74.9	45.9
02:00 PM - 03:00 PM	52.6	82.3	44.8
03:00 PM - 04:00 PM	51.2	77.6	46.0
04:00 PM - 05:00 PM	55.7	82.9	47.1
05:00 PM - 06:00 PM	62.9	93.2	52.4
06:00 PM - 07:00 PM	54.8	74.9	49.6
07:00 PM - 08:00 PM	53.3	78.7	49.7
08:00 PM - 09:00 PM	53.5	71.7	50.2
09:00 PM - 10:00 PM	48.8	62.9	46.8
10:00 PM - 11:00 PM	49.5	66.8	47.3
11:00 PM - 12:00 AM	48.5	58.8	47.1
12:00 AM - 01:00 AM	48.0	72.7	46.0
01:00 AM - 02:00 AM	46.6	60.5	44.9
02:00 AM - 03:00 AM	47.0	63.5	45.3
03:00 AM - 04:00 AM	48.4	62.7	46.2
04:00 AM - 05:00 AM	51.4	75.9	45.9
05:00 AM - 06:00 AM	51.2	72.9	45.8
06:00 AM - 07:00 AM	52.8	76.6	45.6
07:00 AM - 08:00 AM	54.3	81.7	44.8
08:00 AM - 09:00 AM	50.1	74.2	44.0
09:00 AM - 10:00 AM	48.6	73.5	40.7
10:00 AM - 11:00 AM	51.6	76.2	40.9
Leq Average 24 hrs. (dB(A))	55.5		
Lmax (dB(A))		93.2	
L90 (dB(A))			46.0
Ldn (dB(A))	58.3		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Technical Management
Saranya C.
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Scientist (4)

Approved by
Supot S.
Supot Salamteh
Section Head

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542341
Date Received : May 26, 2025
Date Reported : Jun 04, 2025
Report Number: 3323360-1

Sample Number	2542341-7
Parameter	Noise (Leq 24 hrs.)
Location	บ้านโคกเชือก (GPS 47P 0697994, 1588673)
Measurement Date	May 22 - May 23, 2025
Measurement by	Vanich Phanpipit
Sound Level meter	Serial No. 858525

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	51.3	75.3	41.3
12:00 PM - 01:00 PM	45.8	72.9	39.5
01:00 PM - 02:00 PM	47.9	75.1	38.7
02:00 PM - 03:00 PM	47.1	70.0	40.3
03:00 PM - 04:00 PM	49.5	74.5	42.8
04:00 PM - 05:00 PM	49.2	71.3	43.5
05:00 PM - 06:00 PM	53.6	75.1	46.0
06:00 PM - 07:00 PM	57.3	85.2	47.1
07:00 PM - 08:00 PM	52.0	76.8	46.6
08:00 PM - 09:00 PM	52.3	74.0	47.9
09:00 PM - 10:00 PM	48.9	65.6	46.9
10:00 PM - 11:00 PM	48.1	68.8	47.0
11:00 PM - 12:00 AM	47.5	65.9	45.6
12:00 AM - 01:00 AM	45.7	57.4	44.1
01:00 AM - 02:00 AM	45.4	62.7	44.0
02:00 AM - 03:00 AM	45.1	66.4	43.7
03:00 AM - 04:00 AM	45.0	68.0	42.6
04:00 AM - 05:00 AM	47.1	69.2	44.0
05:00 AM - 06:00 AM	49.3	74.9	44.4
06:00 AM - 07:00 AM	53.4	80.7	45.4
07:00 AM - 08:00 AM	51.3	71.4	44.3
08:00 AM - 09:00 AM	49.7	76.3	43.6
09:00 AM - 10:00 AM	52.3	80.5	40.7
10:00 AM - 11:00 AM	45.8	72.1	39.9
Leq Average 24 hrs. (dB(A))	50.5		
Lmax (dB(A))		85.2	
L90 (dB(A))			44.0
Ldn (dB(A))	55.3		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Technical Management
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Approved by
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Supot Salamteh
Section Head

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542341
Date Received : May 26, 2025
Date Reported : Jun 04, 2025
Report Number: 3323361-1

Sample Number	2542341-8
Parameter	Noise (Leq 24 hrs.)
Location	โรงเรียนบ้านใหม่ทุ่งดินขอ (ชุมชนบ้านใหม่) (GPS 47P 0697277, 1589425)
Measurement Date	May 16 - May 17, 2025
Measurement by	Vanich Phanpipit
Sound Level meter	Serial No. 296514

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	51.1	74.3	45.4
12:00 PM - 01:00 PM	53.8	76.0	45.0
01:00 PM - 02:00 PM	52.8	72.1	44.5
02:00 PM - 03:00 PM	53.2	72.1	44.0
03:00 PM - 04:00 PM	52.6	72.3	44.3
04:00 PM - 05:00 PM	67.0	83.9	46.8
05:00 PM - 06:00 PM	57.7	86.8	46.1
06:00 PM - 07:00 PM	55.5	75.4	49.5
07:00 PM - 08:00 PM	53.8	67.1	49.8
08:00 PM - 09:00 PM	56.9	65.0	53.6
09:00 PM - 10:00 PM	54.9	77.3	51.9
10:00 PM - 11:00 PM	55.0	72.2	51.5
11:00 PM - 12:00 AM	56.0	65.6	51.5
12:00 AM - 01:00 AM	53.3	62.7	51.0
01:00 AM - 02:00 AM	54.4	64.4	49.9
02:00 AM - 03:00 AM	54.0	64.6	50.6
03:00 AM - 04:00 AM	51.6	67.5	48.8
04:00 AM - 05:00 AM	52.1	66.6	49.3
05:00 AM - 06:00 AM	55.9	74.4	51.0
06:00 AM - 07:00 AM	56.8	74.1	51.1
07:00 AM - 08:00 AM	55.4	71.4	48.8
08:00 AM - 09:00 AM	54.6	71.1	49.9
09:00 AM - 10:00 AM	54.1	74.7	45.8
10:00 AM - 11:00 AM	52.9	74.6	46.4
Leq Average 24 hrs. (dB(A))	56.9		
Lmax (dB(A))		86.8	
L90 (dB(A))			49.3
Ldn (dB(A))	61.7		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Technical Management
Saranya C.
Saranya Chalermthamrong
Scientist (4)

Approved by
Supot S.
Supot Salamteh
Section Head

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542341
Date Received : May 26, 2025
Date Reported : Jun 04, 2025
Report Number: 3323362-1

Sample Number	2542341-9
Parameter	Noise (Leq 24 hrs.)
Location	โรงเรียนบ้านใหม่ทุ่งดินขอ (ชุมชนบ้านใหม่) (GPS 47P 0697277, 1589425)
Measurement Date	May 17 - May 18, 2025
Measurement by	Vanich Phanpipit
Sound Level meter	Serial No. 296514

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	52.3	70.5	44.7
12:00 PM - 01:00 PM	52.3	72.3	42.5
01:00 PM - 02:00 PM	51.2	76.1	42.1
02:00 PM - 03:00 PM	53.9	72.1	43.1
03:00 PM - 04:00 PM	50.7	72.1	45.1
04:00 PM - 05:00 PM	52.2	70.6	44.2
05:00 PM - 06:00 PM	55.1	86.1	44.7
06:00 PM - 07:00 PM	54.8	82.7	46.6
07:00 PM - 08:00 PM	58.9	84.3	51.2
08:00 PM - 09:00 PM	57.7	71.7	54.2
09:00 PM - 10:00 PM	55.6	66.5	53.6
10:00 PM - 11:00 PM	55.6	63.5	53.8
11:00 PM - 12:00 AM	54.5	64.3	52.6
12:00 AM - 01:00 AM	53.9	66.2	52.1
01:00 AM - 02:00 AM	52.8	60.2	50.3
02:00 AM - 03:00 AM	51.5	68.6	49.7
03:00 AM - 04:00 AM	52.2	62.8	48.6
04:00 AM - 05:00 AM	52.9	64.4	50.4
05:00 AM - 06:00 AM	55.8	77.2	52.1
06:00 AM - 07:00 AM	56.8	74.7	52.4
07:00 AM - 08:00 AM	56.7	78.0	49.3
08:00 AM - 09:00 AM	54.9	77.6	46.7
09:00 AM - 10:00 AM	53.3	73.1	45.7
10:00 AM - 11:00 AM	53.8	78.9	44.0
Leq Average 24 hrs. (dB(A))	54.7		
Lmax (dB(A))		86.1	
L90 (dB(A))			48.6
Ldn (dB(A))	60.8		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Technical Management
Saranya C.
Saranya Chalermthamrong
Scientist (4)

Approved by
Supot S.
Supot Salamteh
Section Head

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542341
Date Received : May 26, 2025
Date Reported : Jun 04, 2025
Report Number: 3323363-1

Sample Number	2542341-10
Parameter	Noise (Leq 24 hrs.)
Location	โรงเรียนบ้านใหม่ทุ่งดินขอ (ชุมชนบ้านใหม่) (GPS 47P 0697277, 1589425)
Measurement Date	May 18 - May 19, 2025
Measurement by	Vanich Phanpipit
Sound Level meter	Serial No. 296514

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	51.9	72.2	46.1
12:00 PM - 01:00 PM	59.9	95.6	43.2
01:00 PM - 02:00 PM	53.3	73.4	42.8
02:00 PM - 03:00 PM	55.8	73.8	42.4
03:00 PM - 04:00 PM	52.0	72.7	41.4
04:00 PM - 05:00 PM	52.4	73.8	42.4
05:00 PM - 06:00 PM	52.1	76.8	43.2
06:00 PM - 07:00 PM	49.8	73.5	43.6
07:00 PM - 08:00 PM	53.0	72.5	46.7
08:00 PM - 09:00 PM	55.8	75.1	51.2
09:00 PM - 10:00 PM	56.7	72.9	54.2
10:00 PM - 11:00 PM	54.8	78.0	52.8
11:00 PM - 12:00 AM	53.0	70.1	51.8
12:00 AM - 01:00 AM	53.4	63.1	52.1
01:00 AM - 02:00 AM	51.7	66.6	48.4
02:00 AM - 03:00 AM	51.9	70.4	47.7
03:00 AM - 04:00 AM	48.7	64.5	46.9
04:00 AM - 05:00 AM	48.7	64.8	47.2
05:00 AM - 06:00 AM	52.1	74.1	48.1
06:00 AM - 07:00 AM	54.6	73.0	49.1
07:00 AM - 08:00 AM	57.9	77.2	51.0
08:00 AM - 09:00 AM	56.8	74.2	48.9
09:00 AM - 10:00 AM	56.1	73.7	47.1
10:00 AM - 11:00 AM	55.7	72.8	45.7
Leq Average 24 hrs. (dB(A))	54.6		
Lmax (dB(A))		95.6	
L90 (dB(A))			47.1
Ldn (dB(A))	59.5		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Technical Management
Saranya C.
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Scientist (4)

Approved by
Supot S.
Supot Salamteh
Section Head

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542341
Date Received : May 26, 2025
Date Reported : Jun 04, 2025
Report Number: 3323364-1

Sample Number	2542341-11
Parameter	Noise (Leq 24 hrs.)
Location	โรงเรียนบ้านใหม่ทุ่งดินขอ (ชุมชนบ้านใหม่) (GPS 47P 0697277, 1589425)
Measurement Date	May 19 - May 20, 2025
Measurement by	Vanich Phanpipit
Sound Level meter	Serial No. 296514

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	49.4	70.0	43.0
12:00 PM - 01:00 PM	52.1	81.0	46.1
01:00 PM - 02:00 PM	53.5	71.3	43.9
02:00 PM - 03:00 PM	48.4	69.7	42.2
03:00 PM - 04:00 PM	53.4	85.2	42.4
04:00 PM - 05:00 PM	54.4	72.7	42.8
05:00 PM - 06:00 PM	61.3	83.7	47.2
06:00 PM - 07:00 PM	69.2	84.5	46.9
07:00 PM - 08:00 PM	52.1	69.9	48.0
08:00 PM - 09:00 PM	54.1	67.6	52.7
09:00 PM - 10:00 PM	53.7	65.7	51.0
10:00 PM - 11:00 PM	54.1	71.0	50.8
11:00 PM - 12:00 AM	53.7	70.4	49.5
12:00 AM - 01:00 AM	52.7	64.4	49.6
01:00 AM - 02:00 AM	51.6	61.8	48.4
02:00 AM - 03:00 AM	51.9	75.4	46.9
03:00 AM - 04:00 AM	50.8	70.1	47.3
04:00 AM - 05:00 AM	52.6	75.7	47.3
05:00 AM - 06:00 AM	54.0	76.8	48.4
06:00 AM - 07:00 AM	56.2	76.1	49.5
07:00 AM - 08:00 AM	53.0	77.0	48.3
08:00 AM - 09:00 AM	55.1	73.5	48.3
09:00 AM - 10:00 AM	56.6	82.4	45.7
10:00 AM - 11:00 AM	55.7	73.3	43.7
Leq Average 24 hrs. (dB(A))	57.9		
Lmax (dB(A))		85.2	
L90 (dB(A))			47.3
Ldn (dB(A))	61.3		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Technical Management
Saranya C.
Saranya Chalermthamrong
Scientist (4)

Approved by
Supot S.
Supot Salamteh
Section Head

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542341
Date Received : May 26, 2025
Date Reported : Jun 04, 2025
Report Number: 3323365-1

Sample Number	2542341-12
Parameter	Noise (Leq 24 hrs.)
Location	โรงเรียนบ้านใหม่ทุ่งดินขอ (ชุมชนบ้านใหม่) (GPS 47P 0697277, 1589425)
Measurement Date	May 20 - May 21, 2025
Measurement by	Vanich Phanpipit
Sound Level meter	Serial No. 296514

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	52.7	71.1	44.4
12:00 PM - 01:00 PM	54.5	75.2	45.1
01:00 PM - 02:00 PM	55.2	76.2	43.6
02:00 PM - 03:00 PM	52.2	78.4	45.4
03:00 PM - 04:00 PM	53.5	82.0	43.0
04:00 PM - 05:00 PM	54.5	69.7	44.0
05:00 PM - 06:00 PM	51.4	70.2	43.0
06:00 PM - 07:00 PM	51.0	75.6	43.8
07:00 PM - 08:00 PM	54.2	71.0	49.1
08:00 PM - 09:00 PM	55.1	66.4	51.1
09:00 PM - 10:00 PM	52.4	72.9	50.9
10:00 PM - 11:00 PM	52.2	63.2	50.7
11:00 PM - 12:00 AM	51.0	63.4	48.0
12:00 AM - 01:00 AM	51.0	64.7	46.9
01:00 AM - 02:00 AM	51.1	71.8	46.8
02:00 AM - 03:00 AM	49.7	63.5	46.9
03:00 AM - 04:00 AM	50.6	63.2	46.6
04:00 AM - 05:00 AM	52.1	65.2	48.5
05:00 AM - 06:00 AM	54.0	66.6	49.9
06:00 AM - 07:00 AM	56.2	76.9	50.7
07:00 AM - 08:00 AM	54.8	71.4	49.7
08:00 AM - 09:00 AM	55.7	77.6	48.6
09:00 AM - 10:00 AM	55.5	87.6	45.8
10:00 AM - 11:00 AM	53.9	66.9	45.3
Leq Average 24 hrs. (dB(A))	53.5		
Lmax (dB(A))		87.6	
L90 (dB(A))			46.8
Ldn (dB(A))	59.1		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Technical Management
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Scientist (4)

Approved by
Supot Salamteh
Section Head

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542341
Date Received : May 26, 2025
Date Reported : Jun 04, 2025
Report Number: 3323366-1

Sample Number	2542341-13
Parameter	Noise (Leq 24 hrs.)
Location	โรงเรียนบ้านใหม่ทุ่งดินขอ (ชุมชนบ้านใหม่) (GPS 47P 0697277, 1589425)
Measurement Date	May 21 - May 22, 2025
Measurement by	Vanich Phanpipit
Sound Level meter	Serial No. 296514

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	54.2	71.8	46.7
12:00 PM - 01:00 PM	58.0	85.4	45.4
01:00 PM - 02:00 PM	60.8	85.6	49.6
02:00 PM - 03:00 PM	53.8	77.4	46.5
03:00 PM - 04:00 PM	51.2	71.0	45.7
04:00 PM - 05:00 PM	51.6	74.8	46.2
05:00 PM - 06:00 PM	53.9	72.0	47.0
06:00 PM - 07:00 PM	53.5	72.8	46.3
07:00 PM - 08:00 PM	52.4	71.8	46.8
08:00 PM - 09:00 PM	53.5	66.9	48.8
09:00 PM - 10:00 PM	51.7	62.3	49.4
10:00 PM - 11:00 PM	51.9	69.2	50.4
11:00 PM - 12:00 AM	51.0	65.2	49.6
12:00 AM - 01:00 AM	50.5	65.8	49.2
01:00 AM - 02:00 AM	50.5	60.1	49.2
02:00 AM - 03:00 AM	50.2	60.1	48.2
03:00 AM - 04:00 AM	48.6	66.8	46.3
04:00 AM - 05:00 AM	49.7	59.3	47.1
05:00 AM - 06:00 AM	50.1	59.0	47.0
06:00 AM - 07:00 AM	52.0	64.6	48.2
07:00 AM - 08:00 AM	54.8	71.4	49.7
08:00 AM - 09:00 AM	54.8	73.8	47.4
09:00 AM - 10:00 AM	53.8	75.3	47.2
10:00 AM - 11:00 AM	52.9	71.4	44.9
Leq Average 24 hrs. (dB(A))	53.8		
Lmax (dB(A))		85.6	
L90 (dB(A))			47.1
Ldn (dB(A))	58.0		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Technical Management
Saranya C.
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Scientist (4)

Approved by
Supot S.
Supot Salamteh
Section Head

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542341
Date Received : May 26, 2025
Date Reported : Jun 04, 2025
Report Number: 3323367-1

Sample Number	2542341-14
Parameter	Noise (Leq 24 hrs.)
Location	โรงเรียนบ้านใหม่ทุ่งดินขอ (ชุมชนบ้านใหม่) (GPS 47P 0697277, 1589425)
Measurement Date	May 22 - May 23, 2025
Measurement by	Vanich Phanpipit
Sound Level meter	Serial No. 296514

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	52.9	71.3	43.2
12:00 PM - 01:00 PM	54.7	73.4	45.1
01:00 PM - 02:00 PM	50.6	82.0	42.2
02:00 PM - 03:00 PM	49.4	71.4	41.8
03:00 PM - 04:00 PM	53.5	78.3	43.2
04:00 PM - 05:00 PM	54.0	72.0	44.1
05:00 PM - 06:00 PM	54.4	74.4	44.8
06:00 PM - 07:00 PM	51.2	77.0	45.2
07:00 PM - 08:00 PM	54.8	77.8	49.4
08:00 PM - 09:00 PM	53.9	67.2	51.2
09:00 PM - 10:00 PM	53.5	68.6	51.5
10:00 PM - 11:00 PM	54.0	67.7	51.7
11:00 PM - 12:00 AM	50.4	66.6	49.3
12:00 AM - 01:00 AM	48.6	63.0	47.1
01:00 AM - 02:00 AM	47.2	59.8	45.7
02:00 AM - 03:00 AM	46.9	57.6	45.5
03:00 AM - 04:00 AM	47.0	66.6	44.2
04:00 AM - 05:00 AM	49.2	65.5	45.3
05:00 AM - 06:00 AM	50.9	62.3	47.0
06:00 AM - 07:00 AM	57.0	74.7	49.1
07:00 AM - 08:00 AM	54.3	71.6	46.2
08:00 AM - 09:00 AM	55.9	75.3	46.7
09:00 AM - 10:00 AM	53.9	71.4	45.8
10:00 AM - 11:00 AM	52.5	75.6	44.0
Leq Average 24 hrs. (dB(A))	52.9		
Lmax (dB(A))		82.0	
L90 (dB(A))			45.5
Ldn (dB(A))	58.3		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Technical Management
Saranya Chalermthamrong
Scientist (4)

Approved by
Supot Salamteh
Section Head

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542341
Date Received : May 26, 2025
Date Reported : Jun 04, 2025
Report Number: 3323368-1

Sample Number	2542341-15
Parameter	Noise (Leq 24 hrs.)
Location	ริมรั้วโครงการด้านทิศตะวันตก (GPS 47P 0697861, 1589156)
Measurement Date	May 16 - May 17, 2025
Measurement by	Vanich Phanpipit
Sound Level meter	Serial No. 572609

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	64.2	78.7	63.2
12:00 PM - 01:00 PM	63.5	69.4	63.1
01:00 PM - 02:00 PM	65.4	72.8	63.1
02:00 PM - 03:00 PM	64.5	72.8	63.1
03:00 PM - 04:00 PM	63.4	68.2	63.0
04:00 PM - 05:00 PM	63.5	72.4	63.0
05:00 PM - 06:00 PM	63.5	73.3	63.1
06:00 PM - 07:00 PM	64.5	75.4	63.3
07:00 PM - 08:00 PM	64.0	68.1	63.5
08:00 PM - 09:00 PM	64.0	69.0	63.6
09:00 PM - 10:00 PM	63.8	72.3	63.5
10:00 PM - 11:00 PM	63.9	69.9	63.5
11:00 PM - 12:00 AM	63.9	66.6	63.5
12:00 AM - 01:00 AM	63.8	67.0	63.5
01:00 AM - 02:00 AM	63.7	67.0	63.4
02:00 AM - 03:00 AM	63.8	65.6	63.4
03:00 AM - 04:00 AM	63.9	77.2	63.5
04:00 AM - 05:00 AM	63.8	70.7	63.4
05:00 AM - 06:00 AM	64.6	77.1	63.5
06:00 AM - 07:00 AM	64.8	75.2	63.5
07:00 AM - 08:00 AM	64.7	69.3	63.3
08:00 AM - 09:00 AM	63.3	71.2	62.8
09:00 AM - 10:00 AM	63.6	70.4	63.1
10:00 AM - 11:00 AM	64.9	68.1	64.3
Leq Average 24 hrs. (dB(A))	64.1		
Lmax (dB(A))		78.7	
L90 (dB(A))			63.4
Ldn (dB(A))	70.5		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Technical Management
Saranya C.
Saranya Chalermthamrong
Scientist (4)

Approved by
Supot S.
Supot Salamteh
Section Head

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542341
Date Received : May 26, 2025
Date Reported : Jun 04, 2025
Report Number: 3323369-1

Sample Number	2542341-16
Parameter	Noise (Leq 24 hrs.)
Location	ริมรั้วโครงการด้านทิศตะวันตก (GPS 47P 0697861, 1589156)
Measurement Date	May 17 - May 18, 2025
Measurement by	Vanich Phanpipit
Sound Level meter	Serial No. 572609

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	64.9	71.0	63.0
12:00 PM - 01:00 PM	63.6	72.8	62.7
01:00 PM - 02:00 PM	64.7	71.2	62.7
02:00 PM - 03:00 PM	64.7	70.5	63.0
03:00 PM - 04:00 PM	63.6	75.0	63.0
04:00 PM - 05:00 PM	63.9	81.7	63.1
05:00 PM - 06:00 PM	63.7	79.9	63.1
06:00 PM - 07:00 PM	64.4	79.6	63.3
07:00 PM - 08:00 PM	64.2	73.7	63.7
08:00 PM - 09:00 PM	64.3	73.3	63.9
09:00 PM - 10:00 PM	64.4	69.4	64.1
10:00 PM - 11:00 PM	64.5	69.5	64.2
11:00 PM - 12:00 AM	64.8	70.2	64.1
12:00 AM - 01:00 AM	64.4	67.9	63.9
01:00 AM - 02:00 AM	63.6	66.4	63.0
02:00 AM - 03:00 AM	63.3	65.1	62.9
03:00 AM - 04:00 AM	63.3	67.1	62.9
04:00 AM - 05:00 AM	63.3	70.2	62.9
05:00 AM - 06:00 AM	63.6	77.1	63.1
06:00 AM - 07:00 AM	69.7	77.8	63.3
07:00 AM - 08:00 AM	63.9	70.0	63.2
08:00 AM - 09:00 AM	64.8	72.4	62.9
09:00 AM - 10:00 AM	64.8	70.4	63.5
10:00 AM - 11:00 AM	68.3	76.0	63.1
Leq Average 24 hrs. (dB(A))	64.9		
Lmax (dB(A))		81.7	
L90 (dB(A))			63.1
Ldn (dB(A))	71.4		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Technical Management
Saranya C.
Saranya Chalermthamrong
Scientist (4)

Approved by
Supot S.
Supot Salamteh
Section Head

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542341
Date Received : May 26, 2025
Date Reported : Jun 04, 2025
Report Number: 3323370-1

Sample Number	2542341-17
Parameter	Noise (Leq 24 hrs.)
Location	ริมรั้วโครงการด้านทิศตะวันตก (GPS 47P 0697861, 1589156)
Measurement Date	May 18 - May 19, 2025
Measurement by	Vanich Phanpipit
Sound Level meter	Serial No. 572609

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	68.3	77.5	62.5
12:00 PM - 01:00 PM	65.8	74.5	62.4
01:00 PM - 02:00 PM	63.6	72.0	62.1
02:00 PM - 03:00 PM	67.2	76.2	62.3
03:00 PM - 04:00 PM	63.7	69.2	62.1
04:00 PM - 05:00 PM	63.8	79.7	62.3
05:00 PM - 06:00 PM	62.7	73.3	62.3
06:00 PM - 07:00 PM	63.2	76.4	62.5
07:00 PM - 08:00 PM	64.1	78.0	63.1
08:00 PM - 09:00 PM	64.6	77.5	63.3
09:00 PM - 10:00 PM	66.0	69.3	64.9
10:00 PM - 11:00 PM	66.1	70.3	64.1
11:00 PM - 12:00 AM	64.8	67.5	64.0
12:00 AM - 01:00 AM	64.3	68.7	63.2
01:00 AM - 02:00 AM	63.8	67.2	62.5
02:00 AM - 03:00 AM	63.3	68.7	62.4
03:00 AM - 04:00 AM	63.1	67.3	62.3
04:00 AM - 05:00 AM	62.9	67.9	62.1
05:00 AM - 06:00 AM	63.1	72.4	62.4
06:00 AM - 07:00 AM	64.4	74.0	62.4
07:00 AM - 08:00 AM	62.7	69.7	62.2
08:00 AM - 09:00 AM	62.7	72.5	62.2
09:00 AM - 10:00 AM	63.9	79.0	63.1
10:00 AM - 11:00 AM	63.4	69.6	62.7
Leq Average 24 hrs. (dB(A))	64.5		
Lmax (dB(A))		79.7	
L90 (dB(A))			62.4
Ldn (dB(A))	70.6		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Technical Management
Saranya Chalermthamrong
Scientist (4)

Approved by
Supot Salamteh
Section Head

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542341
Date Received : May 26, 2025
Date Reported : Jun 04, 2025
Report Number: 3323371-1

Sample Number	2542341-18
Parameter	Noise (Leq 24 hrs.)
Location	ริมรั้วโครงการด้านทิศตะวันตก (GPS 47P 0697861, 1589156)
Measurement Date	May 19 - May 20, 2025
Measurement by	Vanich Phanpipit
Sound Level meter	Serial No. 572609

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	63.6	80.9	62.5
12:00 PM - 01:00 PM	63.1	75.7	62.4
01:00 PM - 02:00 PM	63.3	70.9	62.5
02:00 PM - 03:00 PM	63.8	69.4	62.4
03:00 PM - 04:00 PM	63.0	71.0	62.4
04:00 PM - 05:00 PM	63.5	84.3	62.5
05:00 PM - 06:00 PM	63.3	78.8	62.7
06:00 PM - 07:00 PM	63.1	81.7	62.6
07:00 PM - 08:00 PM	63.8	77.6	62.9
08:00 PM - 09:00 PM	63.4	76.5	63.0
09:00 PM - 10:00 PM	63.6	67.0	63.2
10:00 PM - 11:00 PM	63.5	65.3	63.1
11:00 PM - 12:00 AM	63.4	66.8	63.0
12:00 AM - 01:00 AM	63.4	65.5	62.9
01:00 AM - 02:00 AM	63.3	66.5	62.9
02:00 AM - 03:00 AM	63.2	67.3	62.8
03:00 AM - 04:00 AM	63.1	65.3	62.8
04:00 AM - 05:00 AM	63.2	65.4	62.9
05:00 AM - 06:00 AM	63.5	74.5	63.0
06:00 AM - 07:00 AM	63.8	75.3	63.2
07:00 AM - 08:00 AM	63.5	76.2	63.1
08:00 AM - 09:00 AM	63.5	69.7	63.0
09:00 AM - 10:00 AM	63.9	83.7	62.9
10:00 AM - 11:00 AM	62.9	68.7	62.5
Leq Average 24 hrs. (dB(A))	63.4		
Lmax (dB(A))		84.3	
L90 (dB(A))			62.9
Ldn (dB(A))	69.8		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Technical Management
Saranya C.
Saranya Chalermthamrong
Scientist (4)

Approved by
Supot S.
Supot Salamteh
Section Head

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542341
Date Received : May 26, 2025
Date Reported : Jun 04, 2025
Report Number: 3323372-1

Sample Number	2542341-19
Parameter	Noise (Leq 24 hrs.)
Location	ริมรั้วโครงการด้านทิศตะวันตก (GPS 47P 0697861, 1589156)
Measurement Date	May 20 - May 21, 2025
Measurement by	Vanich Phanpipit
Sound Level meter	Serial No. 572609

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	62.9	80.5	62.4
12:00 PM - 01:00 PM	62.6	69.8	62.2
01:00 PM - 02:00 PM	62.9	70.1	62.3
02:00 PM - 03:00 PM	62.8	67.3	62.3
03:00 PM - 04:00 PM	62.6	71.0	62.2
04:00 PM - 05:00 PM	62.8	71.1	62.3
05:00 PM - 06:00 PM	63.1	75.2	62.6
06:00 PM - 07:00 PM	63.5	69.3	63.0
07:00 PM - 08:00 PM	65.6	68.9	63.9
08:00 PM - 09:00 PM	65.6	73.2	64.3
09:00 PM - 10:00 PM	65.5	69.1	63.9
10:00 PM - 11:00 PM	65.7	67.7	63.9
11:00 PM - 12:00 AM	65.4	68.0	63.6
12:00 AM - 01:00 AM	65.1	69.3	63.5
01:00 AM - 02:00 AM	63.3	66.1	62.9
02:00 AM - 03:00 AM	64.0	68.6	63.1
03:00 AM - 04:00 AM	64.8	70.4	63.5
04:00 AM - 05:00 AM	63.6	67.0	63.0
05:00 AM - 06:00 AM	63.8	77.7	63.1
06:00 AM - 07:00 AM	63.3	79.2	62.8
07:00 AM - 08:00 AM	63.5	84.5	62.8
08:00 AM - 09:00 AM	63.2	75.5	62.6
09:00 AM - 10:00 AM	63.1	79.5	62.5
10:00 AM - 11:00 AM	62.8	72.6	62.4
Leq Average 24 hrs. (dB(A))	64.0		
Lmax (dB(A))		84.5	
L90 (dB(A))			62.8
Ldn (dB(A))	70.7		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Technical Management
Saranya C.
Saranya Chalermthamrong
Scientist (4)

Approved by
Supot S.
Supot Salamteh
Section Head

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542341
Date Received : May 26, 2025
Date Reported : Jun 04, 2025
Report Number: 3323373-1

Sample Number	2542341-20
Parameter	Noise (Leq 24 hrs.)
Location	ริมรั้วโครงการด้านทิศตะวันตก (GPS 47P 0697861, 1589156)
Measurement Date	May 21 - May 22, 2025
Measurement by	Vanich Phanpipit
Sound Level meter	Serial No. 572609

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	63.0	74.5	62.5
12:00 PM - 01:00 PM	64.9	92.7	62.9
01:00 PM - 02:00 PM	65.8	91.3	63.2
02:00 PM - 03:00 PM	64.1	82.3	63.5
03:00 PM - 04:00 PM	64.1	82.5	63.6
04:00 PM - 05:00 PM	64.2	80.2	63.5
05:00 PM - 06:00 PM	63.8	69.7	63.4
06:00 PM - 07:00 PM	64.0	74.7	63.4
07:00 PM - 08:00 PM	63.7	78.5	63.1
08:00 PM - 09:00 PM	64.3	75.2	63.3
09:00 PM - 10:00 PM	64.1	70.1	63.5
10:00 PM - 11:00 PM	63.8	69.0	63.4
11:00 PM - 12:00 AM	63.7	66.5	63.3
12:00 AM - 01:00 AM	63.6	68.1	63.2
01:00 AM - 02:00 AM	63.5	67.9	63.2
02:00 AM - 03:00 AM	63.5	65.4	63.2
03:00 AM - 04:00 AM	63.4	65.1	63.1
04:00 AM - 05:00 AM	63.5	66.4	63.1
05:00 AM - 06:00 AM	63.4	65.3	63.1
06:00 AM - 07:00 AM	63.7	69.7	63.3
07:00 AM - 08:00 AM	64.4	76.4	63.5
08:00 AM - 09:00 AM	64.0	76.5	63.4
09:00 AM - 10:00 AM	63.7	77.0	63.1
10:00 AM - 11:00 AM	64.4	83.9	62.9
Leq Average 24 hrs. (dB(A))	64.0		
Lmax (dB(A))		92.7	
L90 (dB(A))			63.2
Ldn (dB(A))	70.1		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Technical Management
Saranya C.
Saranya Chalermthamrong
Scientist (4)

Approved by
Supot S.
Supot Salamteh
Section Head

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542341
Date Received : May 26, 2025
Date Reported : Jun 04, 2025
Report Number: 3323374-1

Sample Number	2542341-21
Parameter	Noise (Leq 24 hrs.)
Location	ริมรั้วโครงการด้านทิศตะวันตก (GPS 47P 0697861, 1589156)
Measurement Date	May 22 - May 23, 2025
Measurement by	Vanich Phanpipit
Sound Level meter	Serial No. 572609

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
11:00 AM - 12:00 PM	63.5	82.2	62.6
12:00 PM - 01:00 PM	62.9	74.1	62.3
01:00 PM - 02:00 PM	62.6	73.9	62.2
02:00 PM - 03:00 PM	63.7	72.0	62.8
03:00 PM - 04:00 PM	63.0	72.4	62.4
04:00 PM - 05:00 PM	63.0	71.2	62.5
05:00 PM - 06:00 PM	63.1	79.0	62.5
06:00 PM - 07:00 PM	62.9	70.4	62.5
07:00 PM - 08:00 PM	63.2	76.1	62.7
08:00 PM - 09:00 PM	64.0	73.6	63.0
09:00 PM - 10:00 PM	63.5	69.7	63.0
10:00 PM - 11:00 PM	63.5	66.6	63.2
11:00 PM - 12:00 AM	63.4	66.9	63.0
12:00 AM - 01:00 AM	63.3	66.1	62.9
01:00 AM - 02:00 AM	63.2	66.0	62.8
02:00 AM - 03:00 AM	63.1	67.5	62.8
03:00 AM - 04:00 AM	63.3	64.8	62.9
04:00 AM - 05:00 AM	63.3	65.0	62.9
05:00 AM - 06:00 AM	63.3	68.3	63.0
06:00 AM - 07:00 AM	63.4	67.3	63.0
07:00 AM - 08:00 AM	64.4	75.7	63.3
08:00 AM - 09:00 AM	63.6	67.8	63.1
09:00 AM - 10:00 AM	63.8	69.7	63.1
10:00 AM - 11:00 AM	64.1	81.4	63.4
Leq Average 24 hrs. (dB(A))	63.4		
Lmax (dB(A))		82.2	
L90 (dB(A))			62.9
Ldn (dB(A))	69.7		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2
Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Technical Management
Saranya C.
Saranya Chalermthamrong
Scientist (4)

Approved by
Supot S.
Supot Salamteh
Section Head

ภาคผนวก ค-4

คุณภาพน้ำทิ้ง

Analysis / Test Report

TESTING
No.0009

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location: GNK2

Lot ID: 24143925
Date Received : Jan 09, 2025
Date Reported : Jan 14, 2025
Report Number : 3201862-1

Sample Number	24143925-1
Sampled Date	Jan 09, 2025 9:48 AM
Sample Description	Wastewater
Location	บ่อพักน้ำก่อนปล่อยน้ำทิ้ง
Date Analysis Commenced	Jan 10, 2025
Condition of Sample	Contained in one amber glass bottle and one plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
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	Bangkok
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	Bangkok
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	Bangkok
pH at 25 degree C		-	-	7.7	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Bangkok
Residual Free Chlorine *	mg/L	-	0.1	<0.1	≤1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-Cl (F)	Bangkok
Temperature *	Degree C	-	-	26.6	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Bangkok
Total Dissolved solids Dried at 180 degree C	mg/L	-	5	1244	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Bangkok
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	13	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Bangkok

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 : Chawanthat Nakpanom ทะเบียนเลขที่ ว-204-จ-0087

Remark :
- LOD : Limit of Detection

Technical Management

Siriluk Bunnak
Section Head
ทะเบียนเลขที่ ว-204-จ-0013

Approved by

Kanokkorn Anek
Assistant General Manager
ทะเบียนเลขที่ ว-204-ค-0004

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.

Analysis / Test Report

TESTING
No.0009

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location: GNK2

Lot ID: 24143925
Date Received : Jan 09, 2025
Date Reported : Jan 14, 2025
Report Number : 3201862-1

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

Technical Management

Siriluk Bunnak
Section Head
ทะเบียนเลขที่ ว-204-จ-0013

Approved by

Kanokkorn Anek
Assistant General Manager
ทะเบียนเลขที่ ว-204-ค-0004

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Analysis / Test Report

TESTING
No.0009

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location: GNK2

Lot ID: 2510576
Date Received : Feb 06, 2025
Date Reported : Feb 11, 2025
Report Number : 3225217-1

Sample Number	2510576-1
Sampled Date	Feb 06, 2025 9:20 AM
Sample Description	Wastewater
Location	บ่อพักน้ำก่อนปล่อยน้ำทิ้ง
Date Analysis Commenced	Feb 07, 2025
Condition of Sample	Contained in one amber glass bottle and one plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
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	Bangkok
Color (at pH 7.0)	ADMI	-	5	11	≤600	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Bangkok
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	Bangkok
pH at 25 degree C		-	-	7.9	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Bangkok
Residual Free Chlorine *	mg/L	-	0.1	<0.1	≤1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-Cl (F)	Bangkok
Temperature *	Degree C	-	-	28.3	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Bangkok
Total Dissolved solids Dried at 180 degree C	mg/L	-	5	1448	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Bangkok
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	13	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Bangkok

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 : Teerawat Puangsuk ทะเบียนเลขที่ ว-204-จ-0058

Remark :
- LOD : Limit of Detection

Technical Management

Siriluk Bunnak
Section Head
ทะเบียนเลขที่ ว-204-จ-0013

Approved by

Kanokkorn Anek
Assistant General Manager
ทะเบียนเลขที่ ว-204-ค-0004

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.

Analysis / Test Report

TESTING
No.0009

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location: GNK2

Lot ID: 2510576
Date Received : Feb 06, 2025
Date Reported : Feb 11, 2025
Report Number : 3225217-1

- "<" : 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

Siriluk Bunnak
Section Head
ทะเบียนเลขที่ ว-204-จ-0013

Approved by

Kanokkorn Anek
Assistant General Manager
ทะเบียนเลขที่ ว-204-ค-0004

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.

LABORATORY ACCREDITATION
BLA-DSS

TESTING
No.0009

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location: GNK2

Lot ID: 2517147
Date Received : Mar 06, 2025
Date Reported : Mar 11, 2025
Report Number : 3241206-1

Sample Number	2517147-1
Sampled Date	Mar 06, 2025 9:30 AM
Sample Description	Wastewater
Location	บ่อพักน้ำก่อนปล่อยน้ำทิ้ง
Date Analysis Commenced	Mar 07, 2025
Condition of Sample	Contained in one amber glass bottle and one plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Color (at Original pH)	ADMI	-	5	8	≤600	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Bangkok
Color (at pH 7.0)	ADMI	-	5	11	≤600	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Bangkok
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	Bangkok
pH at 25 degree C		-	-	7.9	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Bangkok
Residual Free Chlorine *	mg/L	-	0.1	<0.1	≤1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-Cl (F)	Bangkok
Temperature *	Degree C	-	-	30.8	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Bangkok
Total Dissolved solids Dried at 180 degree C	mg/L	-	5	1404	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Bangkok
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	Bangkok

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 : Teerawat Puangsuk ทะเบียนเลขที่ ว-204-จ-0058

Remark :

Technical Management

Suwimon Chairuangwut
Scientist (3)
ทะเบียนเลขที่ ว-204-จ-0018

Approved by

Kanokkorn Anek
Assistant General Manager
ทะเบียนเลขที่ ว-204-ค-0004

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.

LABORATORY ACCREDITATION
BLA-DSS

TESTING
No.0009

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location: GNK2

Lot ID: 2517147
Date Received : Mar 06, 2025
Date Reported : Mar 11, 2025
Report Number : 3241206-1

- 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

Suwimon Chairuangwut
Scientist (3)
ทะเบียนเลขที่ ว-204-จ-0018

Approved by

Kanokkorn Anek
Assistant General Manager
ทะเบียนเลขที่ ว-204-ค-0004

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.

Analysis / Test Report

TESTING
No.0009

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location: GNK2

Lot ID: 2530418
Date Received : Apr 03, 2025
Date Reported : Apr 08, 2025
Report Number : 3270878-1

Sample Number	2530418-1
Sampled Date	Apr 03, 2025 8:50 AM
Sample Description	Wastewater
Location	บ่อพักน้ำก่อนปล่อยน้ำทิ้ง
Date Analysis Commenced	Apr 04, 2025
Condition of Sample	Contained in one amber glass bottle and one plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Color (at Original pH)	ADMI	-	5	13	≤600	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Bangkok
Color (at pH 7.0)	ADMI	-	5	13	≤600	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Bangkok
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	Bangkok
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)	Bangkok
Residual Free Chlorine *	mg/L	-	0.1	<0.1	≤1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-Cl (F)	Bangkok
Temperature *	Degree C	-	-	31.1	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Bangkok
Total Dissolved solids Dried at 180 degree C	mg/L	-	5	1480	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Bangkok
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	Bangkok

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 : Naruebet Permpoon ทะเบียนเลขที่ ว-204-จ-0071

Remark :
- LOD : Limit of Detection

Technical Management

Suwimon Chairuangwut
Scientist (3)
ทะเบียนเลขที่ ว-204-จ-0018

Approved by

Kanokkorn Anek
Assistant General Manager
ทะเบียนเลขที่ ว-204-ค-0004

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.

Analysis / Test Report

TESTING
No.0009

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location: GNK2

Lot ID: 2530418
Date Received : Apr 03, 2025
Date Reported : Apr 08, 2025
Report Number : 3270878-1

- "<" : 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

Suwimon Chairuangwut
Scientist (3)
ทะเบียนเลขที่ ว-204-จ-0018

Approved by

Kanokkorn Anek
Assistant General Manager
ทะเบียนเลขที่ ว-204-ค-0004

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Analysis / Test Report

TESTING
No.0009

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location: GNK2

Lot ID: 2542327
Date Received : May 08, 2025
Date Reported : May 14, 2025
Report Number : 3298721-1

Sample Number	2542327-1
Sampled Date	May 08, 2025 11:40 AM
Sample Description	Wastewater
Location	บ่อพักน้ำก่อนปล่อยน้ำทิ้ง
Date Analysis Commenced	May 09, 2025
Condition of Sample	Contained in one amber glass bottle and one plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Color (at Original pH)	ADMI	-	5	14	≤600	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Bangkok
Color (at pH 7.0)	ADMI	-	5	11	≤600	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Bangkok
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	Bangkok
pH at 25 degree C		-	-	7.5	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Bangkok
Residual Free Chlorine *	mg/L	-	0.1	<0.1	≤1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-Cl (F)	Bangkok
Temperature *	Degree C	-	-	32.5	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Bangkok
Total Dissolved solids Dried at 180 degree C	mg/L	-	5	1704	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Bangkok
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	11	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Bangkok

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 : Teerawat Puangsuk ทะเบียนเลขที่ ว-204-จ-0058

Remark :
- LOD : Limit of Detection

Technical Management

Siriluk Bunnak
Section Head
ทะเบียนเลขที่ ว-204-จ-0013

Approved by

Kanokkorn Anek
Assistant General Manager
ทะเบียนเลขที่ ว-204-ค-0004

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.

Analysis / Test Report

TESTING
No.0009

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location: GNK2

Lot ID: 2542327
Date Received : May 08, 2025
Date Reported : May 14, 2025
Report Number : 3298721-1

- "<" : 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

Siriluk Bunnak
Section Head
ทะเบียนเลขที่ ว-204-จ-0013

Approved by

Kanokkorn Anek
Assistant General Manager
ทะเบียนเลขที่ ว-204-ค-0004

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Analysis / Test Report

TESTING
No.0009

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location: GNK2

Lot ID: 2547214
Date Received : Jun 05, 2025
Date Reported : Jun 10, 2025
Report Number : 3309843-1

Sample Number	2547214-1
Sampled Date	Jun 05, 2025 9:40 AM
Sample Description	Wastewater
Location	บ่อพักน้ำก่อนปล่อยน้ำทิ้ง
Date Analysis Commenced	Jun 06, 2025
Condition of Sample	Contained in one amber glass bottle and one plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
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	Bangkok
Color (at pH 7.0)	ADMI	-	5	12	≤600	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Bangkok
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	Bangkok
pH at 25 degree C		-	-	7.5	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Bangkok
Residual Free Chlorine *	mg/L	-	0.1	<0.1	≤1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-Cl (F)	Bangkok
Temperature *	Degree C	-	-	33.2	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Bangkok
Total Dissolved solids Dried at 180 degree C	mg/L	-	5	1540	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Bangkok
Total Suspended Solids Dried at 103-105 degree C	mg/L	-	5	7	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Bangkok

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 : Norraset Komal ทะเบียนเลขที่ ว-204-จ-0015

Remark :
- LOD : Limit of Detection

Technical Management

Suwimon Chairuangwut
Scientist (3)
ทะเบียนเลขที่ ว-204-จ-0018

Approved by

Kanokkorn Anek
Assistant General Manager
ทะเบียนเลขที่ ว-204-ค-0004

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Analysis / Test Report

TESTING
No.0009

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location: GNK2

Lot ID: 2547214
Date Received : Jun 05, 2025
Date Reported : Jun 10, 2025
Report Number : 3309843-1

- "<" : 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

Suwimon Chairuangwut
Scientist (3)
ทะเบียนเลขที่ ว-204-จ-0018

Approved by

Kanokkorn Anek
Assistant General Manager
ทะเบียนเลขที่ ว-204-ค-0004

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ภาคผนวก ค-5

อาชีวอนามัยและความปลอดภัย

ความเข้มของแสงสว่างในการทำงาน

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location:

Lot ID: 2510557 (1)
Date Received : Feb 05, 2025
Date Reported : Feb 20, 2025
Report Number: 2510557 (1)-1

GNK2

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : Administration Building : Ground floor : Canteen (โซนปรุงอาหาร)	2510557 (1)-1	4-Feb-25	Day time	1	533	590	150	300	Pass
		2510557 (1)-2	4-Feb-25	Day time	2	648				
2	Area : Administration Building : Ground floor : MAID ROOM	2510557 (1)-3	4-Feb-25	Day time	1	345	362	100	200	Pass
		2510557 (1)-4	4-Feb-25	Day time	2	378				
3	Area : Administration Building : Ground floor : Meeting Room 1	2510557 (1)-5	4-Feb-25	Day time	1	635	679	150	300	Pass
		2510557 (1)-6	4-Feb-25	Day time	2	735				
		2510557 (1)-7	4-Feb-25	Day time	3	699				
		2510557 (1)-8	4-Feb-25	Day time	4	678				
		2510557 (1)-9	4-Feb-25	Day time	5	778				
		2510557 (1)-10	4-Feb-25	Day time	6	723				
		2510557 (1)-11	4-Feb-25	Day time	7	540				
		2510557 (1)-12	4-Feb-25	Day time	8	725				
		2510557 (1)-13	4-Feb-25	Day time	9	600				
		2510557 (1)-14	4-Feb-25	Day time	10	678				
5	Spot : Administration Building : Ground floor : โต๊ะ Admin Manager GA	2510557 (1)-15	4-Feb-25	Day time	1	441	-	400-500	-	Pass
6	Spot : Administration Building : Ground floor : โต๊ะนักเคมี	2510557 (1)-16	4-Feb-25	Day time	1	410	-	400-500	-	Pass
7	Spot : Administration Building : Ground floor : โต๊ะ EH&S	2510557 (1)-17	4-Feb-25	Day time	1	486	-	400-500	-	Pass
8	Spot : Administration Building : Ground floor : ห้อง J-Power	2510557 (1)-18	4-Feb-25	Day time	1	685	-	400-500	-	Pass
9	Spot : Administration Building : Ground floor : โต๊ะ Plant Manager	2510557 (1)-19	4-Feb-25	Day time	1	971	-	400-500	-	Pass
10	Spot : Administration Building : Ground floor : โต๊ะ GA Officer	2510557 (1)-20	4-Feb-25	Day time	1	415	-	400-500	-	Pass
11	Spot : Administration Building : Ground floor : โต๊ะจัดซื้อ	2510557 (1)-21	4-Feb-25	Day time	1	435	-	400-500	-	Pass
12	Area : Administration Building : Ground floor : ทางเดิน (โซนบริเวณหน้าห้องถ่ายเอกสาร)	2510557 (1)-22	4-Feb-25	Day time	1	105	136	50	100	Pass
		2510557 (1)-23	4-Feb-25	Day time	2	152				
		2510557 (1)-24	4-Feb-25	Day time	3	121				
		2510557 (1)-25	4-Feb-25	Day time	4	168				

Technical Management
Supot Salamteh
Section Head

Approved by
Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location:

Lot ID: 2510557 (1)
Date Received : Feb 05, 2025
Date Reported : Feb 20, 2025
Report Number: 2510557 (1)-1

GNK2

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
13	Area : Administration Building : Ground floor : ห้องถ่ายเอกสาร	2510557 (1)-26	4-Feb-25	Day time	1	408	416	150	300	Pass
		2510557 (1)-27	4-Feb-25	Day time	2	423				
14	Area : Administration Building : Ground floor : ห้องเก็บเอกสาร	2510557 (1)-28	4-Feb-25	Day time	1	286	260	50	100	Pass
		2510557 (1)-29	4-Feb-25	Day time	2	235				
15	Area : Administration Building : Ground floor : ห้องพยาบาล	2510557 (1)-30	4-Feb-25	Day time	1	489	517	25	50	Pass
		2510557 (1)-31	4-Feb-25	Day time	2	545				
16	Area : Administration Building : Ground floor : ห้องสุขาชาย	2510557 (1)-32	4-Feb-25	Day time	1	275	493	50	100	Pass
		2510557 (1)-33	4-Feb-25	Day time	2	711				
17	Area : Administration Building : Ground floor : ห้องสุขาหญิง	2510557 (1)-34	4-Feb-25	Day time	1	341	596	50	100	Pass
		2510557 (1)-35	4-Feb-25	Day time	2	850				

Measurement by : Manassawin Naiyanate

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 Salamteh
Section Head

Approved by
Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location:

Lot ID: 2510557 (2)

Date Received : Feb 05, 2025
Date Reported : Feb 20, 2025
Report Number: 2510557 (2)-1

GNK2

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : Central Control Building : 1st Floor : Battery Room	2510557 (2)-1	4-Feb-25	Day time	1	201	203	100	200	Pass
		2510557 (2)-2	4-Feb-25	Day time	2	205				
3	Area : Central Control Building : 1st Floor : ทางลงบันได	2510557 (2)-3	4-Feb-25	Day time	1	1,611	1022	50	100	Pass
		2510557 (2)-4	4-Feb-25	Day time	2	808				
		2510557 (2)-5	4-Feb-25	Day time	3	1,193				
		2510557 (2)-6	4-Feb-25	Day time	4	475				
4	Area : Central Control Building : 1st Floor : บันไดทางหนีไฟ	2510557 (2)-7	4-Feb-25	Day time	1	83	210	-	10	Pass
		2510557 (2)-8	4-Feb-25	Day time	2	325				
		2510557 (2)-9	4-Feb-25	Day time	3	309				
		2510557 (2)-10	4-Feb-25	Day time	4	144				
		2510557 (2)-11	4-Feb-25	Day time	5	420				
		2510557 (2)-12	4-Feb-25	Day time	6	587				
		2510557 (2)-13	4-Feb-25	Day time	7	74				
		2510557 (2)-14	4-Feb-25	Day time	8	140				
		2510557 (2)-15	4-Feb-25	Day time	9	375				
		2510557 (2)-16	4-Feb-25	Day time	10	222				
		2510557 (2)-17	4-Feb-25	Day time	11	478				
		2510557 (2)-18	4-Feb-25	Day time	12	587				
		2510557 (2)-19	4-Feb-25	Day time	13	176				
		2510557 (2)-20	4-Feb-25	Day time	14	265				
		2510557 (2)-21	4-Feb-25	Day time	15	370				
		2510557 (2)-22	4-Feb-25	Day time	16	114				
		2510557 (2)-23	4-Feb-25	Day time	17	125				
		2510557 (2)-24	4-Feb-25	Day time	18	115				
		2510557 (2)-25	4-Feb-25	Day time	19	101				
		2510557 (2)-26	4-Feb-25	Day time	20	105				
		2510557 (2)-27	4-Feb-25	Day time	21	110				
		2510557 (2)-28	4-Feb-25	Day time	22	83				
		2510557 (2)-29	4-Feb-25	Day time	23	93				
		2510557 (2)-30	4-Feb-25	Day time	24	84				
		2510557 (2)-31	4-Feb-25	Day time	25	78				
		2510557 (2)-32	4-Feb-25	Day time	26	73				
		2510557 (2)-33	4-Feb-25	Day time	27	25				
5	Spot : Central Control Building : 1st Floor : ตู้สวิตซ์ 10BBB05	2510557 (2)-34	4-Feb-25	Day time	1	489	-	200-300	-	Pass
		2510557 (2)-35	4-Feb-25	Night time	1	417	-	200-300	-	Pass

Technical Management

Supot Salamteh
Section Head

Approved by

Wichan Choonharat
Assistant Manager

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ADDRESS 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250 Thailand | PHONE +66 0 2760 3000 | FAX +66 0 2760 3197
ALS LABORATORY GROUP (THAILAND) CO., LTD. **An ALS Limited Company**

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location:

Lot ID: 2510557 (2)

Date Received : Feb 05, 2025
Date Reported : Feb 20, 2025
Report Number: 2510557 (2)-1

GNK2

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
6	Spot : Central Control Building : 1st Floor : ตู้สวิตซ์ 10BBA07	2510557 (2)-36	4-Feb-25	Day time	1	431	-	200-300	-	Pass
		2510557 (2)-37	4-Feb-25	Night time	1	432	-	200-300	-	Pass

Measurement by : Manassawin Naiyanate

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 Salamteh
Section Head

Approved by

Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location:

Lot ID: 2510557 (3)

Date Received : Feb 05, 2025
Date Reported : Feb 20, 2025
Report Number: 2510557 (3)-1

GNK2

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : Central Control Building : 2nd Floor : Canteen	2510557 (3)-1	4-Feb-25	Day time	1	543	540	150	300	Pass
		2510557 (3)-2	4-Feb-25	Day time	2	536				
		2510557 (3)-3	4-Feb-25	Night time	1	568	574	150	300	Pass
		2510557 (3)-4	4-Feb-25	Night time	2	581				
2	Spot : Central Control Building : 2nd Floor : Control Room #1	2510557 (3)-5	4-Feb-25	Day time	1	430	-	400-500	-	Pass
		2510557 (3)-6	4-Feb-25	Night time	1	434	-	400-500	-	Pass
3	Spot : Central Control Building : 2nd Floor : Control Room #2	2510557 (3)-7	4-Feb-25	Day time	1	410	-	400-500	-	Pass
		2510557 (3)-8	4-Feb-25	Night time	1	405	-	400-500	-	Pass
4	Spot : Central Control Building : 2nd Floor : Control Room #3	2510557 (3)-9	4-Feb-25	Day time	1	415	-	400-500	-	Pass
		2510557 (3)-10	4-Feb-25	Night time	1	407	-	400-500	-	Pass
5	Spot : Central Control Building : 2nd Floor : Control Room #4	2510557 (3)-11	4-Feb-25	Day time	1	407	-	400-500	-	Pass
		2510557 (3)-12	4-Feb-25	Night time	1	405	-	400-500	-	Pass
6	Spot : Central Control Building : 2nd Floor : Control Room #5	2510557 (3)-13	4-Feb-25	Day time	1	589	-	400-500	-	Pass
7	Spot : Central Control Building : 2nd Floor : Control Room #6	2510557 (3)-14	4-Feb-25	Day time	1	571	-	400-500	-	Pass
8	Area : Central Control Building : 2nd Floor : Document Center	2510557 (3)-15	4-Feb-25	Day time	1	369	458	50	100	Pass
		2510557 (3)-16	4-Feb-25	Day time	2	547				
12	Spot : Central Control Building : 2nd Floor : โต๊ะ Operation Manager	2510557 (3)-17	4-Feb-25	Day time	1	699	-	400-500	-	Pass
13	Spot : Central Control Building : 2nd Floor : โต๊ะ Shift Operator Room #1	2510557 (3)-18	4-Feb-25	Day time	1	689	-	400-500	-	Pass
14	Spot : Central Control Building : 2nd Floor : โต๊ะ Shift Operator Room #2	2510557 (3)-19	4-Feb-25	Day time	1	698	-	400-500	-	Pass
15	Spot : Central Control Building : 2nd Floor : ตู้ควบคุม	2510557 (3)-20	4-Feb-25	Day time	1	205	-	200-300	-	Pass
17	Area : Central Control Building : 2nd Floor : สุขาหญิง (โซนบริเวณอ่างล้างมือ)	2510557 (3)-21	4-Feb-25	Day time	1	687	616	50	100	Pass
		2510557 (3)-22	4-Feb-25	Day time	2	545				
18	Area : Central Control Building : 2nd Floor : สุขาชาย (โซนบริเวณโถปัสสาวะ)	2510557 (3)-23	4-Feb-25	Day time	1	146	148	50	100	Pass
		2510557 (3)-24	4-Feb-25	Day time	2	150				

Technical Management

Supot Salamteh
Section Head

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Assistant Manager

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ALS LABORATORY GROUP (THAILAND) CO., LTD. **An ALS Limited Company**

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location:

Lot ID: 2510557 (3)
Date Received : Feb 05, 2025
Date Reported : Feb 20, 2025
Report Number: 2510557 (3)-1

GNK2

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
19	Area : Central Control Building : 2nd Floor : ห้องเก็บของ	2510557 (3)-25	4-Feb-25	Day time	1	266	246	50	100	Pass
		2510557 (3)-26	4-Feb-25	Day time	2	227				
20	Area : Central Control Building : 2nd Floor : ห้องอาบน้ำชาย	2510557 (3)-27	4-Feb-25	Day time	1	652	551	50	100	Pass
		2510557 (3)-28	4-Feb-25	Day time	2	450				
21	Area : Central Control Building : 2nd Floor : ห้องอาบน้ำหญิง	2510557 (3)-29	4-Feb-25	Day time	1	356	356	50	100	Pass
		2510557 (3)-30	4-Feb-25	Day time	2	357				
23	Area : Central Control Building : 2nd Floor : ทางเดิน (โซนบริเวณหน้าห้องน้ำ)	2510557 (3)-31	4-Feb-25	Day time	1	316	424	50	100	Pass
		2510557 (3)-32	4-Feb-25	Day time	2	359				
		2510557 (3)-33	4-Feb-25	Day time	3	211				
		2510557 (3)-34	4-Feb-25	Day time	4	812				
24	Spot : Central Control Building : 2nd Floor : Control Room : โต๊ะ Engineering Room #1	2510557 (3)-35	4-Feb-25	Day time	1	635	-	400-500	-	Pass
25	Spot : Central Control Building : 2nd Floor : Control Room : โต๊ะ Engineering Room #2	2510557 (3)-36	4-Feb-25	Day time	1	544	-	400-500	-	Pass

Measurement by : Manassawin Naiyanate

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 Salamteh
Section Head

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Assistant Manager

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Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location:

Lot ID: 2510557 (4)

Date Received : Feb 05, 2025
Date Reported : Feb 20, 2025
Report Number: 2510557 (4)-1

GNK2

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : Central Control Building : Ground Floor : Cabel Room (โซนบริเวณฝั่งประตูทางเข้าหลัก)	2510557 (4)-1	4-Feb-25	Day time	1	205	213	100	200	Pass
		2510557 (4)-2	4-Feb-25	Day time	2	206				
		2510557 (4)-3	4-Feb-25	Day time	3	217				
		2510557 (4)-4	4-Feb-25	Day time	4	211				
		2510557 (4)-5	4-Feb-25	Day time	5	204				
		2510557 (4)-6	4-Feb-25	Day time	6	205				
		2510557 (4)-7	4-Feb-25	Day time	7	207				
		2510557 (4)-8	4-Feb-25	Day time	8	207				
		2510557 (4)-9	4-Feb-25	Day time	9	208				
		2510557 (4)-10	4-Feb-25	Day time	10	220				
		2510557 (4)-11	4-Feb-25	Day time	11	215				
		2510557 (4)-12	4-Feb-25	Day time	12	204				
		2510557 (4)-13	4-Feb-25	Day time	13	231				
		2510557 (4)-14	4-Feb-25	Day time	14	224				
		2510557 (4)-15	4-Feb-25	Day time	15	220				
		2510557 (4)-16	4-Feb-25	Day time	16	230				

Measurement by : Manassawin Naiyanate

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Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location:

Lot ID: 2510557 (5)
Date Received : Feb 05, 2025
Date Reported : Feb 20, 2025
Report Number: 2510557 (5)-1

GNK2

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : Chiller GT 12 :	2510557 (5)-1	4-Feb-25	Night time	1	205	204	100	200	Pass
		2510557 (5)-2	4-Feb-25	Night time	2	204				
2	Spot : Electrical Fire Pump :	2510557 (5)-3	4-Feb-25	Night time	1	230	-	200-300	-	Pass
4	Spot : HRSG 11 : HP Drum	2510557 (5)-4	4-Feb-25	Night time	1	205	-	200-300	-	Pass
5	Spot : HRSG 12 : HP Drum	2510557 (5)-5	4-Feb-25	Night time	1	285	-	200-300	-	Pass
6	Spot : HRSG 11 : HP Stream	2510557 (5)-6	4-Feb-25	Night time	1	205	-	200-300	-	Pass
7	Spot : HRSG 12 : HP Stream	2510557 (5)-7	4-Feb-25	Night time	1	204	-	200-300	-	Pass
8	Area : HRSG 11 : บันได 2	2510557 (5)-8	4-Feb-25	Night time	1	65	66	25	50	Pass
		2510557 (5)-9	4-Feb-25	Night time	2	66				
9	Spot : HRSG 11 : LP Drum	2510557 (5)-10	4-Feb-25	Night time	1	205	-	200-300	-	Pass
10	Spot : HRSG 12 : LP Drum	2510557 (5)-11	4-Feb-25	Night time	1	205	-	200-300	-	Pass
11	Area : RTU Room Gas (Matering) :	2510557 (5)-12	4-Feb-25	Night time	1	343	402	100	200	Pass
		2510557 (5)-13	4-Feb-25	Night time	2	464				
		2510557 (5)-14	4-Feb-25	Night time	3	387				
		2510557 (5)-15	4-Feb-25	Night time	4	412				

Measurement by : Manassawin Naiyanate

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

Lot ID: 2510557 (6)

Date Received : Feb 05, 2025
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Report Number: 2510557 (6)-1

GNK2

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : HRSG 11 : ทางเดิน Stack	2510557 (6)-1	4-Feb-25	Night time	1	121	120	25	50	Pass
		2510557 (6)-2	4-Feb-25	Night time	2	120				
2	Area : HRSG 12 : ทางเดิน Stack	2510557 (6)-3	4-Feb-25	Night time	1	55	56	25	50	Pass
		2510557 (6)-4	4-Feb-25	Night time	2	56				
3	Area : HRSG 12 : ทางเดิน 2	2510557 (6)-5	4-Feb-25	Night time	1	52	54	25	50	Pass
		2510557 (6)-6	4-Feb-25	Night time	2	55				
4	Area : ทางเดินบริเวณท่อชั้น 1 (Pipe rack) : โซนบริเวณพื้นปูนซีเมนต์	2510557 (6)-7	4-Feb-25	Night time	1	145	148	25	50	Pass
		2510557 (6)-8	4-Feb-25	Night time	2	151				
5	Area : HRSG 11 : ทางเดิน	2510557 (6)-9	4-Feb-25	Night time	1	129	158	25	50	Pass
		2510557 (6)-10	4-Feb-25	Night time	2	187				
6	Area : HRSG 12 : ทางเดิน	2510557 (6)-11	4-Feb-25	Night time	1	150	148	25	50	Pass
		2510557 (6)-12	4-Feb-25	Night time	2	146				
7	Area : ทางเดินในโรงไฟฟ้า : หน้าตึก Control Room	2510557 (6)-13	4-Feb-25	Night time	1	65	64	25	50	Pass
		2510557 (6)-14	4-Feb-25	Night time	2	64				
8	Area : HRSG 12 : ทางเดิน 1	2510557 (6)-15	4-Feb-25	Night time	1	62	64	25	50	Pass
		2510557 (6)-16	4-Feb-25	Night time	2	66				

Measurement by : Manassawin Naiyanate

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Technical Management
Supot Salamteh
Section Head

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Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location:

Lot ID: 2510557 (7)

Date Received : Feb 05, 2025
Date Reported : Feb 20, 2025
Report Number: 2510557 (7)-1

GNK2

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Spot : Demin Plant : Conductivity Anion A	2510557 (7)-1	4-Feb-25	Night time	1	210	-	200-300	-	Pass
2	Area : Demin Plant : Control Room (โซนบริเวณหน้าห้อง)	2510557 (7)-2	4-Feb-25	Night time	1	305	295	100	200	Pass
		2510557 (7)-3	4-Feb-25	Night time	2	285				
3	Spot : Demin Plant : pH Neutralization Basin	2510557 (7)-4	4-Feb-25	Night time	1	205	-	200-300	-	Pass
4	Area : Demin Plant : ทางเดิน	2510557 (7)-5	4-Feb-25	Night time	1	124	106	50	100	Pass
		2510557 (7)-6	4-Feb-25	Night time	2	157				
		2510557 (7)-7	4-Feb-25	Night time	3	73				
		2510557 (7)-8	4-Feb-25	Night time	4	52				
		2510557 (7)-9	4-Feb-25	Night time	5	154				
		2510557 (7)-10	4-Feb-25	Night time	6	94				
		2510557 (7)-11	4-Feb-25	Night time	7	91				
		2510557 (7)-12	4-Feb-25	Night time	8	105				

Measurement by : Manassawin Naiyanate

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Technical Management

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Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location:

Lot ID: 2510557 (8)

Date Received : Feb 05, 2025
Date Reported : Feb 20, 2025
Report Number: 2510557 (8)-1

GNK2

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : Guard House : Ground Floor : ป้อม รปภ.	2510557 (8)-1	4-Feb-25	Day time	1	2,340	2345	-	100	Pass
		2510557 (8)-2	4-Feb-25	Day time	2	2,350				
		2510557 (8)-3	4-Feb-25	Night time	1	205	204	-	100	Pass
		2510557 (8)-4	4-Feb-25	Night time	2	204				
2	Area : Guard House : Ground Floor : ห้องสุขาป้อม รปภ.	2510557 (8)-5	4-Feb-25	Day time	1	242	245	50	100	Pass
		2510557 (8)-6	4-Feb-25	Day time	2	248				
		2510557 (8)-7	4-Feb-25	Night time	1	101	104	50	100	Pass
		2510557 (8)-8	4-Feb-25	Night time	2	107				

Measurement by : Manassawin Naiyanate

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Technical Management

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189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location:

Lot ID: 2510557 (9)

Date Received : Feb 05, 2025
Date Reported : Feb 20, 2025
Report Number: 2510557 (9)-1

GNK2

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : Switchayard : Battery Room 1	2510557 (9)-1	4-Feb-25	Day time	1	220	216	100	200	Pass
		2510557 (9)-2	4-Feb-25	Day time	2	211				
2	Area : Switchayard : Battery Room 2	2510557 (9)-3	4-Feb-25	Day time	1	201	203	100	200	Pass
		2510557 (9)-4	4-Feb-25	Day time	2	205				
5	Area : Switchayard : Switchyard Control Room	2510557 (9)-5	4-Feb-25	Day time	1	204	206	100	200	Pass
		2510557 (9)-6	4-Feb-25	Day time	2	207				
6	Area : Switchayard : ทางลงบันได	2510557 (9)-7	4-Feb-25	Day time	1	12,070	10605	25	50	Pass
		2510557 (9)-8	4-Feb-25	Day time	2	9,140				
8	Area : Switchayard : Switchyard Room (Customer)	2510557 (9)-9	4-Feb-25	Day time	1	205	204	100	200	Pass
		2510557 (9)-10	4-Feb-25	Day time	2	203				
9	Area : Switchayard : Control Room Terminal โซนบริเวณหน้าห้องตู้ฝั่งซ้าย	2510557 (9)-11	4-Feb-25	Day time	1	1,217	1015	100	200	Pass
		2510557 (9)-12	4-Feb-25	Day time	2	443				
		2510557 (9)-13	4-Feb-25	Day time	3	521				
		2510557 (9)-14	4-Feb-25	Day time	4	1,879				
10	Area : Switchayard : Switchgear โซนบริเวณกลางห้อง	2510557 (9)-15	4-Feb-25	Day time	1	203	230	100	200	Pass
		2510557 (9)-16	4-Feb-25	Day time	2	257				
11	Area : Switchayard : Switchgear Room (EGAT) โซนบริเวณท้ายห้อง	2510557 (9)-17	4-Feb-25	Day time	1	252	252	100	200	Pass
		2510557 (9)-18	4-Feb-25	Day time	2	253				

Measurement by : Manassawin Naiyanate

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 JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location:

Lot ID: 2510557 (10)
Date Received : Feb 05, 2025
Date Reported : Feb 20, 2025
Report Number: 2510557 (10)-1

GNK2

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : Water Treatment Control Building : Laboratory : Ground Floor : Control Room (โซนบริเวณหน้าห้อง)	2510557 (10)-1	4-Feb-25	Day time	1	298	295	100	200	Pass
		2510557 (10)-2	4-Feb-25	Day time	2	292				
2	Spot : Water Treatment Control Building : Laboratory : Ground Floor : Lab Room #1	2510557 (10)-3	4-Feb-25	Day time	1	410	-	400-500	-	Pass
		2510557 (10)-4	4-Feb-25	Night time	1	405	-	400-500	-	Pass
3	Spot : Water Treatment Control Building : Laboratory : Ground Floor : Lab Room #2	2510557 (10)-5	4-Feb-25	Day time	1	512	-	400-500	-	Pass
		2510557 (10)-6	4-Feb-25	Night time	1	412	-	400-500	-	Pass
4	Spot : Water Treatment Control Building : Laboratory : Ground Floor : Lab Room#3	2510557 (10)-7	4-Feb-25	Day time	1	791	-	400-500	-	Pass
5	Area : Water Treatment Control Building : Laboratory : Ground Floor : ทางเดิน (โซนบริเวณหน้าห้อง Control Room)	2510557 (10)-8	4-Feb-25	Day time	1	4,980	4330	50	100	Pass
		2510557 (10)-9	4-Feb-25	Day time	2	3,680				
6	Area : Water Treatment Control Building : Laboratory : Ground Floor : ห้องสุขาชาย	2510557 (10)-10	4-Feb-25	Day time	1	242	268	50	100	Pass
		2510557 (10)-11	4-Feb-25	Day time	2	295				
7	Area : Water Treatment Control Building : Laboratory : Ground Floor : ห้องสุขาหญิง	2510557 (10)-12	4-Feb-25	Day time	1	158	187	50	100	Pass
		2510557 (10)-13	4-Feb-25	Day time	2	216				

Measurement by : Manassawin Naiyanate

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Technical Management
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189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location:

Lot ID: 2510557 (11)

Date Received : Feb 05, 2025
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Report Number: 2510557 (11)-1

GNK2

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : Workshop and Warehouse : 2nd Floor : Canteen (โซนบริเวณโต๊ะทานข้าว)	2510557 (11)-1	4-Feb-25	Day time	1	360	342	150	300	Pass
		2510557 (11)-2	4-Feb-25	Day time	2	325				
2	Spot : Workshop and Warehouse : 2nd Floor : Maintenance Manager	2510557 (11)-3	4-Feb-25	Day time	1	725	-	400-500	-	Pass
3	Area : Workshop and Warehouse : 2nd Floor : Metting Room (โซนบริเวณหน้าห้องฝั่งผู้บรรยาย)	2510557 (11)-4	4-Feb-25	Day time	1	630	538	150	300	Pass
		2510557 (11)-5	4-Feb-25	Day time	2	445				
6	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ C&I Engineer #1	2510557 (11)-6	4-Feb-25	Day time	1	578	-	400-500	-	Pass
7	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ C&I Leader	2510557 (11)-7	4-Feb-25	Day time	1	479	-	400-500	-	Pass
8	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ Electrical Engineer #1	2510557 (11)-8	4-Feb-25	Day time	1	578	-	400-500	-	Pass
10	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ Electrical Leader	2510557 (11)-9	4-Feb-25	Day time	1	410	-	400-500	-	Pass
11	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ Mechanical Engineer #1	2510557 (11)-10	4-Feb-25	Day time	1	405	-	400-500	-	Pass
12	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ C&I Engineer #2	2510557 (11)-11	4-Feb-25	Day time	1	428	-	400-500	-	Pass
14	Area : Workshop and Warehouse : 2nd Floor : ทางเดินกลางห้อง	2510557 (11)-12	4-Feb-25	Day time	1	239	230	50	100	Pass
		2510557 (11)-13	4-Feb-25	Day time	2	213				
		2510557 (11)-14	4-Feb-25	Day time	3	186				
		2510557 (11)-15	4-Feb-25	Day time	4	188				
		2510557 (11)-16	4-Feb-25	Day time	5	325				
15	Area : Workshop and Warehouse : 2nd Floor : ทางเดินบันได (โซนบริเวณฝั่งที่วางรองเท้า)	2510557 (11)-17	4-Feb-25	Day time	1	168	204	50	100	Pass
		2510557 (11)-18	4-Feb-25	Day time	2	241				
16	Area : Workshop and Warehouse : 2nd Floor : ห้องเก็บเอกสาร 1	2510557 (11)-19	4-Feb-25	Day time	1	489	492	100	200	Pass
		2510557 (11)-20	4-Feb-25	Day time	2	496				
17	Area : Workshop and Warehouse : 2nd Floor : ห้องเก็บเอกสาร 2	2510557 (11)-21	4-Feb-25	Day time	1	375	376	100	200	Pass
		2510557 (11)-22	4-Feb-25	Day time	2	378				
18	Area : Workshop and Warehouse : 2nd Floor : ห้องสุขาชาย (โซนบริเวณอ่างล้างมือ)	2510557 (11)-23	4-Feb-25	Day time	1	189	198	50	100	Pass
		2510557 (11)-24	4-Feb-25	Day time	2	207				

Technical Management

Supot Salamteh
Section Head

Approved by

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Assistant Manager

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Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location:

Lot ID: 2510557 (11)
Date Received : Feb 05, 2025
Date Reported : Feb 20, 2025
Report Number: 2510557 (11)-1

GNK2

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 : ห้องสุขาหญิง (โซนบริเวณอ่างล้างมือ)	2510557 (11)-25	4-Feb-25	Day time	1	105	106	50	100	Pass
		2510557 (11)-26	4-Feb-25	Day time	2	107				
20	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ C&I Office Room #1	2510557 (11)-27	4-Feb-25	Day time	1	431	-	400-500	-	Pass
21	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ C&I Office Room #2	2510557 (11)-28	4-Feb-25	Day time	1	427	-	400-500	-	Pass
22	Area : Workshop and Warehouse : 2nd Floor : ห้องเก็บของ	2510557 (11)-29	4-Feb-25	Day time	1	385	346	100	200	Pass
		2510557 (11)-30	4-Feb-25	Day time	2	307				

Measurement by : Manassawin Naiyanate

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 Salamteh
Section Head

Approved by
Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location:

Lot ID: 2510557 (12)
Date Received : Feb 05, 2025
Date Reported : Feb 20, 2025
Report Number: 2510557 (12)-1

GNK2

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 : C&I Lab (โซนบริเวณหน้าห้อง)	2510557 (12)-1	4-Feb-25	Day time	1	512	488	150	300	Pass
		2510557 (12)-2	4-Feb-25	Day time	2	465				
2	Area : Workshop and Warehouse : Ground Floor : Electrical And Mechanical Workshop (โซนบริเวณวางอุปกรณ์เครื่องมือช่าง)	2510557 (12)-3	4-Feb-25	Day time	1	305	324	150	300	Pass
		2510557 (12)-4	4-Feb-25	Day time	2	307				
		2510557 (12)-5	4-Feb-25	Day time	3	341				
		2510557 (12)-6	4-Feb-25	Day time	4	345				
3	Area : Workshop and Warehouse : Ground Floor : Unsecured Warehouse (โซนบริเวณกลางห้อง)	2510557 (12)-7	4-Feb-25	Day time	1	635	677	100	200	Pass
		2510557 (12)-8	4-Feb-25	Day time	2	664				
		2510557 (12)-9	4-Feb-25	Day time	3	678				
		2510557 (12)-10	4-Feb-25	Day time	4	730				
4	Spot : Workshop and Warehouse : Ground Floor : Warehouse Officer	2510557 (12)-11	4-Feb-25	Day time	1	425	-	400-500	-	Pass
6	Area : Workshop and Warehouse : Ground Floor : สุขาชาย (โซนโถปัสวะ)	2510557 (12)-12	4-Feb-25	Day time	1	406	418	50	100	Pass
		2510557 (12)-13	4-Feb-25	Day time	2	430				
7	Area : Workshop and Warehouse : Ground Floor : สุขาหญิง (โซนบริเวณอ่างล้างมือ)	2510557 (12)-14	4-Feb-25	Day time	1	361	366	50	100	Pass
		2510557 (12)-15	4-Feb-25	Day time	2	370				
8	Area : Workshop and Warehouse : Ground Floor : ห้องจ่ายไฟ	2510557 (12)-16	4-Feb-25	Day time	1	221	230	100	200	Pass
		2510557 (12)-17	4-Feb-25	Day time	2	238				
9	Area : Workshop and Warehouse : Ground Floor : ทางเดินเข้าประตูหลัก (โซนบริเวณหน้าห้อง C&I Lab)	2510557 (12)-18	4-Feb-25	Day time	1	610	568	50	100	Pass
		2510557 (12)-19	4-Feb-25	Day time	2	525				

Measurement by : Manassawin Naiyanate

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 Salamteh
Section Head

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Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location:

Lot ID: 2542361 (1)
Date Received : May 24, 2025
Date Reported : May 29, 2025
Report Number: 2542361 (1)-1

GNK2

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : Administration Building : Ground floor : Canteen (โซนปรุงอาหาร)	2542361 (1)-1	22-May-25	Day time	1	491	450	150	300	Pass
		2542361 (1)-2	22-May-25	Day time	2	409				
2	Area : Administration Building : Ground floor : MAID ROOM	2542361 (1)-3	22-May-25	Day time	1	705	407	100	200	Pass
		2542361 (1)-4	22-May-25	Day time	2	109				
3	Area : Administration Building : Ground floor : Meeting Room 1	2542361 (1)-5	22-May-25	Day time	1	523	730	150	300	Pass
		2542361 (1)-6	22-May-25	Day time	2	593				
		2542361 (1)-7	22-May-25	Day time	3	568				
		2542361 (1)-8	22-May-25	Day time	4	543				
		2542361 (1)-9	22-May-25	Day time	5	641				
		2542361 (1)-10	22-May-25	Day time	6	824				
		2542361 (1)-11	22-May-25	Day time	7	814				
		2542361 (1)-12	22-May-25	Day time	8	925				
		2542361 (1)-13	22-May-25	Day time	9	1,045				
		2542361 (1)-14	22-May-25	Day time	10	826				
5	Spot : Administration Building : Ground floor : โต๊ะ Admin Manager GA	2542361 (1)-15	22-May-25	Day time	1	425	-	400-500	-	Pass
6	Spot : Administration Building : Ground floor : โต๊ะนักเคมี	2542361 (1)-16	22-May-25	Day time	1	401	-	400-500	-	Pass
7	Spot : Administration Building : Ground floor : โต๊ะ EH&S	2542361 (1)-17	22-May-25	Day time	1	425	-	400-500	-	Pass
8	Spot : Administration Building : Ground floor : ห้อง J-Power	2542361 (1)-18	22-May-25	Day time	1	673	-	400-500	-	Pass
9	Spot : Administration Building : Ground floor : โต๊ะ Plant Manager	2542361 (1)-19	22-May-25	Day time	1	481	-	400-500	-	Pass
10	Spot : Administration Building : Ground floor : โต๊ะ GA Officer	2542361 (1)-20	22-May-25	Day time	1	410	-	400-500	-	Pass
11	Spot : Administration Building : Ground floor : โต๊ะจัดซื้อ	2542361 (1)-21	22-May-25	Day time	1	435	-	400-500	-	Pass
12	Area : Administration Building : Ground floor : ทางเดิน (โซนบริเวณหน้าห้องถ่ายเอกสาร)	2542361 (1)-22	22-May-25	Day time	1	403	183	50	100	Pass
		2542361 (1)-23	22-May-25	Day time	2	145				
		2542361 (1)-24	22-May-25	Day time	3	93				
		2542361 (1)-25	22-May-25	Day time	4	90				

Technical Management
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Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location:

Lot ID: 2542361 (1)
Date Received : May 24, 2025
Date Reported : May 29, 2025
Report Number: 2542361 (1)-1

GNK2

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
13	Area : Administration Building : Ground floor : ห้องถ่ายเอกสาร	2542361 (1)-26	22-May-25	Day time	1	463	476	150	300	Pass
		2542361 (1)-27	22-May-25	Day time	2	489				
14	Area : Administration Building : Ground floor : ห้องเก็บเอกสาร	2542361 (1)-28	22-May-25	Day time	1	602	700	50	100	Pass
		2542361 (1)-29	22-May-25	Day time	2	798				
15	Area : Administration Building : Ground floor : ห้องพยาบาล	2542361 (1)-30	22-May-25	Day time	1	620	650	25	50	Pass
		2542361 (1)-31	22-May-25	Day time	2	681				
16	Area : Administration Building : Ground floor : ห้องสุขาชาย	2542361 (1)-32	22-May-25	Day time	1	796	534	50	100	Pass
		2542361 (1)-33	22-May-25	Day time	2	271				
17	Area : Administration Building : Ground floor : ห้องสุขาหญิง	2542361 (1)-34	22-May-25	Day time	1	779	542	50	100	Pass
		2542361 (1)-35	22-May-25	Day time	2	304				

Measurement by : Phongsiri Somkaew

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 Salamteh
Section Head

Approved by
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Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location:

Lot ID: 2542361 (2)

Date Received : May 24, 2025
Date Reported : May 29, 2025
Report Number: 2542361 (2)-1

GNK2

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : Central Control Building : 1st Floor : Battery Room	2542361 (2)-1	22-May-25	Day time	1	229	271	100	200	Pass
		2542361 (2)-2	22-May-25	Day time	2	313				
3	Area : Central Control Building : 1st Floor : ทางลงบันได	2542361 (2)-3	22-May-25	Day time	1	589	458	50	100	Pass
		2542361 (2)-4	22-May-25	Day time	2	709				
		2542361 (2)-5	22-May-25	Day time	3	433				
		2542361 (2)-6	22-May-25	Day time	4	100				
4	Area : Central Control Building : 1st Floor : บันไดทางหนีไฟ	2542361 (2)-7	22-May-25	Day time	1	255	262	-	10	Pass
		2542361 (2)-8	22-May-25	Day time	2	286				
		2542361 (2)-9	22-May-25	Day time	3	421				
		2542361 (2)-10	22-May-25	Day time	4	279				
		2542361 (2)-11	22-May-25	Day time	5	520				
		2542361 (2)-12	22-May-25	Day time	6	182				
		2542361 (2)-13	22-May-25	Day time	7	205				
		2542361 (2)-14	22-May-25	Day time	8	324				
		2542361 (2)-15	22-May-25	Day time	9	301				
		2542361 (2)-16	22-May-25	Day time	10	144				
		2542361 (2)-17	22-May-25	Day time	11	259				
		2542361 (2)-18	22-May-25	Day time	12	462				
		2542361 (2)-19	22-May-25	Day time	13	231				
		2542361 (2)-20	22-May-25	Day time	14	123				
		2542361 (2)-21	22-May-25	Day time	15	204				
		2542361 (2)-22	22-May-25	Day time	16	104				
		2542361 (2)-23	22-May-25	Day time	17	251				
		2542361 (2)-24	22-May-25	Day time	18	329				
		2542361 (2)-25	22-May-25	Day time	19	120				
		2542361 (2)-26	22-May-25	Day time	20	81				
		2542361 (2)-27	22-May-25	Day time	21	101				
		2542361 (2)-28	22-May-25	Day time	22	147				
		2542361 (2)-29	22-May-25	Day time	23	371				
		2542361 (2)-30	22-May-25	Day time	24	446				
		2542361 (2)-31	22-May-25	Day time	25	299				
		2542361 (2)-32	22-May-25	Day time	26	341				
		2542361 (2)-33	22-May-25	Day time	27	301				
5	Spot : Central Control Building : 1st Floor : ตู้สวิตซ์ 10BBB05	2542361 (2)-34	22-May-25	Day time	1	463	-	200-300	-	Pass
		2542361 (2)-35	22-May-25	Night time	1	438	-	200-300	-	Pass

Technical Management

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Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location:

Lot ID: 2542361 (2)
Date Received : May 24, 2025
Date Reported : May 29, 2025
Report Number: 2542361 (2)-1

GNK2

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
6	Spot : Central Control Building : 1st Floor : ตู้สวิตซ์ 10BBA07	2542361 (2)-36	22-May-25	Day time	1	402	-	200-300	-	Pass
		2542361 (2)-37	22-May-25	Night time	1	401	-	200-300	-	Pass

Measurement by : Phongsiri Somkaew

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 Salamteh
Section Head

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Assistant Manager

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Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location:

Lot ID: 2542361 (3)
Date Received : May 24, 2025
Date Reported : May 29, 2025
Report Number: 2542361 (3)-1

GNK2

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : Central Control Building : 2nd Floor : Canteen	2542361 (3)-1	22-May-25	Day time	1	651	617	150	300	Pass
		2542361 (3)-2	22-May-25	Day time	2	583				
		2542361 (3)-3	22-May-25	Night time	1	649	616	150	300	Pass
		2542361 (3)-4	22-May-25	Night time	2	584				
2	Spot : Central Control Building : 2nd Floor : Control Room #1	2542361 (3)-5	22-May-25	Day time	1	453	-	400-500	-	Pass
		2542361 (3)-6	22-May-25	Night time	1	437	-	400-500	-	Pass
3	Spot : Central Control Building : 2nd Floor : Control Room #2	2542361 (3)-7	22-May-25	Day time	1	443	-	400-500	-	Pass
		2542361 (3)-8	22-May-25	Night time	1	417	-	400-500	-	Pass
4	Spot : Central Control Building : 2nd Floor : Control Room #3	2542361 (3)-9	22-May-25	Day time	1	420	-	400-500	-	Pass
		2542361 (3)-10	22-May-25	Night time	1	412	-	400-500	-	Pass
5	Spot : Central Control Building : 2nd Floor : Control Room #4	2542361 (3)-11	22-May-25	Day time	1	460	-	400-500	-	Pass
		2542361 (3)-12	22-May-25	Night time	1	450	-	400-500	-	Pass
6	Spot : Central Control Building : 2nd Floor : Control Room #5	2542361 (3)-13	22-May-25	Day time	1	521	-	400-500	-	Pass
7	Spot : Central Control Building : 2nd Floor : Control Room #6	2542361 (3)-14	22-May-25	Day time	1	574	-	400-500	-	Pass
8	Area : Central Control Building : 2nd Floor : Document Center	2542361 (3)-15	22-May-25	Day time	1	612	515	50	100	Pass
		2542361 (3)-16	22-May-25	Day time	2	418				
12	Spot : Central Control Building : 2nd Floor : โต๊ะ Operation Manager	2542361 (3)-17	22-May-25	Day time	1	561	-	400-500	-	Pass
13	Spot : Central Control Building : 2nd Floor : โต๊ะ Shift Operator Room #1	2542361 (3)-18	22-May-25	Day time	1	585	-	400-500	-	Pass
14	Spot : Central Control Building : 2nd Floor : โต๊ะ Shift Operator Room #2	2542361 (3)-19	22-May-25	Day time	1	667	-	400-500	-	Pass
15	Spot : Central Control Building : 2nd Floor : ตู้ควบคุม	2542361 (3)-20	22-May-25	Day time	1	859	-	200-300	-	Pass
17	Area : Central Control Building : 2nd Floor : สุขาหญิง (โซนบริเวณอ่างล้างมือ)	2542361 (3)-21	22-May-25	Day time	1	398	312	50	100	Pass
		2542361 (3)-22	22-May-25	Day time	2	226				
18	Area : Central Control Building : 2nd Floor : สุขาชาย (โซนบริเวณโถปัสสาวะ)	2542361 (3)-23	22-May-25	Day time	1	137	150	50	100	Pass
		2542361 (3)-24	22-May-25	Day time	2	162				

Technical Management
Supot Salamteh
Section Head

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Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location:

Lot ID: 2542361 (3)
Date Received : May 24, 2025
Date Reported : May 29, 2025
Report Number: 2542361 (3)-1

GNK2

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
19	Area : Central Control Building : 2nd Floor : ห้องเก็บของ	2542361 (3)-25	22-May-25	Day time	1	151	214	50	100	Pass
		2542361 (3)-26	22-May-25	Day time	2	278				
20	Area : Central Control Building : 2nd Floor : ห้องอาบน้ำชาย	2542361 (3)-27	22-May-25	Day time	1	298	212	50	100	Pass
		2542361 (3)-28	22-May-25	Day time	2	127				
21	Area : Central Control Building : 2nd Floor : ห้องอาบน้ำหญิง	2542361 (3)-29	22-May-25	Day time	1	221	195	50	100	Pass
		2542361 (3)-30	22-May-25	Day time	2	169				
23	Area : Central Control Building : 2nd Floor : ทางเดิน (โซนบริเวณหน้าห้องน้ำ)	2542361 (3)-31	22-May-25	Day time	1	1,066	591	50	100	Pass
		2542361 (3)-32	22-May-25	Day time	2	450				
		2542361 (3)-33	22-May-25	Day time	3	471				
		2542361 (3)-34	22-May-25	Day time	4	377				
24	Spot : Central Control Building : 2nd Floor : Control Room : โต๊ะ Engineering Room #1	2542361 (3)-35	22-May-25	Day time	1	656	-	400-500	-	Pass
25	Spot : Central Control Building : 2nd Floor : Control Room : โต๊ะ Engineering Room #2	2542361 (3)-36	22-May-25	Day time	1	664	-	400-500	-	Pass

Measurement by : Phongsiri Somkaew

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 Salamteh
Section Head

Approved by
Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location:

Lot ID: 2542361 (4)

Date Received : May 24, 2025
Date Reported : May 29, 2025
Report Number: 2542361 (4)-1

GNK2

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : Central Control Building : Ground Floor : Cabel Room (โซนบริเวณฝั่งประตูทางเข้าหลัก)	2542361 (4)-1	22-May-25	Day time	1	201	233	100	200	Pass
		2542361 (4)-2	22-May-25	Day time	2	225				
		2542361 (4)-3	22-May-25	Day time	3	128				
		2542361 (4)-4	22-May-25	Day time	4	116				
		2542361 (4)-5	22-May-25	Day time	5	203				
		2542361 (4)-6	22-May-25	Day time	6	235				
		2542361 (4)-7	22-May-25	Day time	7	219				
		2542361 (4)-8	22-May-25	Day time	8	310				
		2542361 (4)-9	22-May-25	Day time	9	245				
		2542361 (4)-10	22-May-25	Day time	10	276				
		2542361 (4)-11	22-May-25	Day time	11	228				
		2542361 (4)-12	22-May-25	Day time	12	324				
		2542361 (4)-13	22-May-25	Day time	13	347				
		2542361 (4)-14	22-May-25	Day time	14	213				
		2542361 (4)-15	22-May-25	Day time	15	261				
		2542361 (4)-16	22-May-25	Day time	16	203				

Measurement by : Phongsiri Somkaew

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 JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location:

Lot ID: 2542361 (5)
Date Received : May 24, 2025
Date Reported : May 29, 2025
Report Number: 2542361 (5)-1

GNK2

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : Chiller GT 12	2542361 (5)-1	22-May-25	Night time	1	200	207	100	200	Pass
		2542361 (5)-2	22-May-25	Night time	2	214				
2	Spot : Electrical Fire Pump	2542361 (5)-3	22-May-25	Night time	1	214	-	200-300	-	Pass
4	Spot : HRSG 11 : HP Drum	2542361 (5)-4	22-May-25	Night time	1	424	-	200-300	-	Pass
5	Spot : HRSG 12 : HP Drum	2542361 (5)-5	22-May-25	Night time	1	204	-	200-300	-	Pass
6	Spot : HRSG 11 : HP Stream	2542361 (5)-6	22-May-25	Night time	1	209	-	200-300	-	Pass
7	Spot : HRSG 12 : HP Stream	2542361 (5)-7	22-May-25	Night time	1	320	-	200-300	-	Pass
8	Area : HRSG 11 : บันได 2	2542361 (5)-8	22-May-25	Night time	1	53	66	25	50	Pass
		2542361 (5)-9	22-May-25	Night time	2	80				
9	Spot : HRSG 11 : LP Drum	2542361 (5)-10	22-May-25	Night time	1	224	-	200-300	-	Pass
10	Spot : HRSG 12 : LP Drum	2542361 (5)-11	22-May-25	Night time	1	249	-	200-300	-	Pass
11	Area : RTU Room Gas (Matering)	2542361 (5)-12	22-May-25	Night time	1	205	264	100	200	Pass
		2542361 (5)-13	22-May-25	Night time	2	203				
		2542361 (5)-14	22-May-25	Night time	3	318				
		2542361 (5)-15	22-May-25	Night time	4	328				

Measurement by : Phongsiri Somkaew

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Technical Management
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Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location:

Lot ID: 2542361 (6)
Date Received : May 24, 2025
Date Reported : May 29, 2025
Report Number: 2542361 (6)-1

GNK2

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : HRSG 11 : ทางเดิน Stack	2542361 (6)-1	22-May-25	Night time	1	112	90	25	50	Pass
		2542361 (6)-2	22-May-25	Night time	2	69				
2	Area : HRSG 12 : ทางเดิน Stack	2542361 (6)-3	22-May-25	Night time	1	121	112	25	50	Pass
		2542361 (6)-4	22-May-25	Night time	2	102				
3	Area : HRSG 12 : ทางเดิน 2	2542361 (6)-5	22-May-25	Night time	1	102	94	25	50	Pass
		2542361 (6)-6	22-May-25	Night time	2	85				
4	Area : ทางเดินบริเวณท่อชั้น 1 (Pipe rack) : โซนบริเวณพื้นปูนซีเมนต์	2542361 (6)-7	22-May-25	Night time	1	128	158	25	50	Pass
		2542361 (6)-8	22-May-25	Night time	2	189				
5	Area : HRSG 11 : ทางเดิน	2542361 (6)-9	22-May-25	Night time	1	114	186	25	50	Pass
		2542361 (6)-10	22-May-25	Night time	2	259				
6	Area : HRSG 12 : ทางเดิน	2542361 (6)-11	22-May-25	Night time	1	161	131	25	50	Pass
		2542361 (6)-12	22-May-25	Night time	2	101				
7	Area : ทางเดินในโรงไฟฟ้า : หน้าดึก Control Room	2542361 (6)-13	22-May-25	Night time	1	65	58	25	50	Pass
		2542361 (6)-14	22-May-25	Night time	2	50				
8	Area : HRSG 12 : ทางเดิน 1	2542361 (6)-15	22-May-25	Night time	1	142	138	25	50	Pass
		2542361 (6)-16	22-May-25	Night time	2	135				

Measurement by : Phongsiri Somkaew

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Technical Management
Supot Salamteh
Section Head

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Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location:

Lot ID: 2542361 (7)

Date Received : May 24, 2025
Date Reported : Jun 06, 2025
Report Number: 2542361 (7)-1

GNK2

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Spot : Demin Plant : Conductivity Anion A	2542361 (7)-1	22-May-25	Night time	1	210	-	200-300	-	Pass
3	Spot : Demin Plant : pH Neutralization Basin	2542361 (7)-4	22-May-25	Night time	1	200	-	200-300	-	Pass
4	Area : Demin Plant : ทางเดิน	2542361 (7)-5	22-May-25	Night time	1	153	152	50	100	Pass
		2542361 (7)-6	22-May-25	Night time	2	169				
		2542361 (7)-7	22-May-25	Night time	3	182				
		2542361 (7)-8	22-May-25	Night time	4	186				
		2542361 (7)-9	22-May-25	Night time	5	100				
		2542361 (7)-10	22-May-25	Night time	6	158				
		2542361 (7)-11	22-May-25	Night time	7	164				
		2542361 (7)-12	22-May-25	Night time	8	102				

Measurement by : Phongsiri Somkaew

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Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location:

Lot ID: 2542361 (8)
Date Received : May 24, 2025
Date Reported : May 29, 2025
Report Number: 2542361 (8)-1

GNK2

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : Guard House : Ground Floor : ป้อม รปภ.	2542361 (8)-1	22-May-25	Day time	1	1,230	1287	-	100	Pass
		2542361 (8)-2	22-May-25	Day time	2	1,344				
		2542361 (8)-3	22-May-25	Night time	1	223	236	-	100	Pass
		2542361 (8)-4	22-May-25	Night time	2	249				
2	Area : Guard House : Ground Floor : ห้องสุขาป้อม รปภ.	2542361 (8)-5	22-May-25	Day time	1	211	226	50	100	Pass
		2542361 (8)-6	22-May-25	Day time	2	240				
		2542361 (8)-7	22-May-25	Night time	1	110	106	50	100	Pass
		2542361 (8)-8	22-May-25	Night time	2	101				

Measurement by : Phongsiri Somkaew

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Technical Management
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Analysis / Test Report

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189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location:

Lot ID: 2542361 (9)

Date Received : May 24, 2025
Date Reported : May 29, 2025
Report Number: 2542361 (9)-1

GNK2

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : Switchayard : Battery Room 1	2542361 (9)-1	22-May-25	Day time	1	204	202	100	200	Pass
		2542361 (9)-2	22-May-25	Day time	2	200				
2	Area : Switchayard : Battery Room 2	2542361 (9)-3	22-May-25	Day time	1	216	210	100	200	Pass
		2542361 (9)-4	22-May-25	Day time	2	205				
5	Area : Switchayard : Switchyard Control Room	2542361 (9)-5	22-May-25	Day time	1	247	232	100	200	Pass
		2542361 (9)-6	22-May-25	Day time	2	216				
6	Area : Switchayard : ทางลงบันได	2542361 (9)-7	22-May-25	Day time	1	1,320	1855	25	50	Pass
		2542361 (9)-8	22-May-25	Day time	2	2,390				
8	Area : Switchayard : Switchyard Room (Customer)	2542361 (9)-9	22-May-25	Day time	1	215	228	100	200	Pass
		2542361 (9)-10	22-May-25	Day time	2	242				
9	Area : Switchayard : Control Room Terminal โซนบริเวณหน้าห้องตู้ฝั่งซ้าย	2542361 (9)-11	22-May-25	Day time	1	471	596	100	200	Pass
		2542361 (9)-12	22-May-25	Day time	2	918				
		2542361 (9)-13	22-May-25	Day time	3	418				
		2542361 (9)-14	22-May-25	Day time	4	577				
10	Area : Switchayard : Switchgear โซนบริเวณกลางห้อง	2542361 (9)-15	22-May-25	Day time	1	261	359	100	200	Pass
		2542361 (9)-16	22-May-25	Day time	2	457				
11	Area : Switchayard : Switchgear Room (EGAT) โซนบริเวณท้ายห้อง	2542361 (9)-17	22-May-25	Day time	1	211	226	100	200	Pass
		2542361 (9)-18	22-May-25	Day time	2	242				

Measurement by : Phongsiri Somkaew

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Technical Management
Supot Salamteh
Section Head

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Assistant Manager

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Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location:

Lot ID: 2542361 (10)
Date Received : May 24, 2025
Date Reported : May 29, 2025
Report Number: 2542361 (10)-1

GNK2

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : Water Treatment Control Building : Laboratory : Ground Floor : Control Room (โซนบริเวณหน้าห้อง)	2542361 (10)-1	22-May-25	Day time	1	570	446	100	200	Pass
		2542361 (10)-2	22-May-25	Day time	2	323				
2	Spot : Water Treatment Control Building : Laboratory : Ground Floor : Lab Room #1	2542361 (10)-3	22-May-25	Day time	1	751	-	400-500	-	Pass
		2542361 (10)-4	22-May-25	Night time	1	476	-	400-500	-	Pass
3	Spot : Water Treatment Control Building : Laboratory : Ground Floor : Lab Room #2	2542361 (10)-5	22-May-25	Day time	1	669	-	400-500	-	Pass
		2542361 (10)-6	22-May-25	Night time	1	491	-	400-500	-	Pass
4	Spot : Water Treatment Control Building : Laboratory : Ground Floor : Lab Room#3	2542361 (10)-7	22-May-25	Day time	1	552	-	400-500	-	Pass
5	Area : Water Treatment Control Building : Laboratory : Ground Floor : ทางเดิน (โซนบริเวณหน้าห้อง Control Room)	2542361 (10)-8	22-May-25	Day time	1	820	1166	50	100	Pass
		2542361 (10)-9	22-May-25	Day time	2	1,512				
6	Area : Water Treatment Control Building : Laboratory : Ground Floor : ห้องสุขาชาย	2542361 (10)-10	22-May-25	Day time	1	293	266	50	100	Pass
		2542361 (10)-11	22-May-25	Day time	2	238				
7	Area : Water Treatment Control Building : Laboratory : Ground Floor : ห้องสุขาหญิง	2542361 (10)-12	22-May-25	Day time	1	208	188	50	100	Pass
		2542361 (10)-13	22-May-25	Day time	2	169				

Measurement by : Phongsiri Somkaew

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Technical Management
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189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location:

Lot ID: 2542361 (11)
Date Received : May 24, 2025
Date Reported : May 29, 2025
Report Number: 2542361 (11)-1

GNK2

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : Workshop and Warehouse : 2nd Floor : Canteen (โซนบริเวณโต๊ะทานข้าว)	2542361 (11)-1	22-May-25	Day time	1	304	342	150	300	Pass
		2542361 (11)-2	22-May-25	Day time	2	381				
2	Spot : Workshop and Warehouse : 2nd Floor : Maintenance Manager	2542361 (11)-3	22-May-25	Day time	1	501	-	400-500	-	Pass
3	Area : Workshop and Warehouse : 2nd Floor : Metting Room (โซนบริเวณหน้าห้องฝั่งผู้บรรยาย)	2542361 (11)-4	22-May-25	Day time	1	414	418	150	300	Pass
		2542361 (11)-5	22-May-25	Day time	2	423				
6	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ C&I Engineer #1	2542361 (11)-6	22-May-25	Day time	1	569	-	400-500	-	Pass
7	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ C&I Leader	2542361 (11)-7	22-May-25	Day time	1	647	-	400-500	-	Pass
8	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ Electrical Engineer #1	2542361 (11)-8	22-May-25	Day time	1	601	-	400-500	-	Pass
10	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ Electrical Leader	2542361 (11)-9	22-May-25	Day time	1	457	-	400-500	-	Pass
11	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ Mechanical Engineer #1	2542361 (11)-10	22-May-25	Day time	1	423	-	400-500	-	Pass
12	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ C&I Engineer #2	2542361 (11)-11	22-May-25	Day time	1	532	-	400-500	-	Pass
14	Area : Workshop and Warehouse : 2nd Floor : ทางเดินกลางห้อง	2542361 (11)-12	22-May-25	Day time	1	268	443	50	100	Pass
		2542361 (11)-13	22-May-25	Day time	2	356				
		2542361 (11)-14	22-May-25	Day time	3	738				
		2542361 (11)-15	22-May-25	Day time	4	486				
		2542361 (11)-16	22-May-25	Day time	5	367				
15	Area : Workshop and Warehouse : 2nd Floor : ทางเดินบันได (โซนบริเวณฝั่งที่วางรองเท้า)	2542361 (11)-17	22-May-25	Day time	1	312	224	50	100	Pass
		2542361 (11)-18	22-May-25	Day time	2	136				
16	Area : Workshop and Warehouse : 2nd Floor : ห้องเก็บเอกสาร 1	2542361 (11)-19	22-May-25	Day time	1	324	410	100	200	Pass
		2542361 (11)-20	22-May-25	Day time	2	496				
17	Area : Workshop and Warehouse : 2nd Floor : ห้องเก็บเอกสาร 2	2542361 (11)-21	22-May-25	Day time	1	326	432	100	200	Pass
		2542361 (11)-22	22-May-25	Day time	2	537				
18	Area : Workshop and Warehouse : 2nd Floor : ห้องสุขาชาย (โซนบริเวณอ่างล้างมือ)	2542361 (11)-23	22-May-25	Day time	1	351	372	50	100	Pass
		2542361 (11)-24	22-May-25	Day time	2	393				

Technical Management
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Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location:

Lot ID: 2542361 (11)
Date Received : May 24, 2025
Date Reported : May 29, 2025
Report Number: 2542361 (11)-1

GNK2

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 : ห้องสุขาหญิง (โซนบริเวณอ่างล้างมือ)	2542361 (11)-25	22-May-25	Day time	1	176	238	50	100	Pass
		2542361 (11)-26	22-May-25	Day time	2	300				
20	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ C&I Office Room #1	2542361 (11)-27	22-May-25	Day time	1	426	-	400-500	-	Pass
21	Spot : Workshop and Warehouse : 2nd Floor : โต๊ะ C&I Office Room #2	2542361 (11)-28	22-May-25	Day time	1	453	-	400-500	-	Pass
22	Area : Workshop and Warehouse : 2nd Floor : ห้องเก็บของ	2542361 (11)-29	22-May-25	Day time	1	368	364	100	200	Pass
		2542361 (11)-30	22-May-25	Day time	2	359				

Measurement by : Phongsiri Somkaew

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Analysis / Test Report

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189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location:

Lot ID: 2542361 (12)
Date Received : May 24, 2025
Date Reported : May 29, 2025
Report Number: 2542361 (12)-1

GNK2

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 : C&I Lab (โซนบริเวณหน้าห้อง)	2542361 (12)-1	22-May-25	Day time	1	620	512	150	300	Pass
		2542361 (12)-2	22-May-25	Day time	2	403				
2	Area : Workshop and Warehouse : Ground Floor : Electrical And Mechanical Workshop (โซนบริเวณวางอุปกรณ์เครื่องมือช่าง)	2542361 (12)-3	22-May-25	Day time	1	345	316	150	300	Pass
		2542361 (12)-4	22-May-25	Day time	2	302				
		2542361 (12)-5	22-May-25	Day time	3	312				
		2542361 (12)-6	22-May-25	Day time	4	304				
3	Area : Workshop and Warehouse : Ground Floor : Unsecured Warehouse (โซนบริเวณกลางห้อง)	2542361 (12)-7	22-May-25	Day time	1	495	525	100	200	Pass
		2542361 (12)-8	22-May-25	Day time	2	575				
		2542361 (12)-9	22-May-25	Day time	3	517				
		2542361 (12)-10	22-May-25	Day time	4	512				
4	Spot : Workshop and Warehouse : Ground Floor : Warehouse Officer	2542361 (12)-11	22-May-25	Day time	1	593	-	400-500	-	Pass
6	Area : Workshop and Warehouse : Ground Floor : สุขาชาย (โซนโถปัสวะ)	2542361 (12)-12	22-May-25	Day time	1	258	352	50	100	Pass
		2542361 (12)-13	22-May-25	Day time	2	445				
7	Area : Workshop and Warehouse : Ground Floor : สุขาหญิง (โซนบริเวณอ่างล้างมือ)	2542361 (12)-14	22-May-25	Day time	1	324	346	50	100	Pass
		2542361 (12)-15	22-May-25	Day time	2	368				
8	Area : Workshop and Warehouse : Ground Floor : ห้องจ่ายไฟ	2542361 (12)-16	22-May-25	Day time	1	264	303	100	200	Pass
		2542361 (12)-17	22-May-25	Day time	2	342				
9	Area : Workshop and Warehouse : Ground Floor : ทางเดินเข้าประตูหลัก (โซนบริเวณหน้าห้อง C&I Lab)	2542361 (12)-18	22-May-25	Day time	1	764	590	50	100	Pass
		2542361 (12)-19	22-May-25	Day time	2	415				

Measurement by : Phongsiri Somkaew

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 Salamteh
Section Head

Approved by
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.

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O :
Project Name : Monitoring EIA
Project Location:

Lot ID: 2553817 (1)
Date Received : Jun 07, 2025
Date Reported : Jun 12, 2025
Report Number: 2553817 (1)-1

GNK2

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
2	Area : Demin Plant : Control Room (โซนบริเวณหน้าห้อง)	2553817 (1)-1	5-Jun-25	Night time	1	392	498	100	200	Pass
		2553817 (1)-2	5-Jun-25	Night time	2	604				

Measurement by : Phongsiri Somkaew

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 Salamteh
Section Head

Approved by
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.

ระดับเสียงในการทำงาน

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2510549
Date Received : Feb 05, 2025
Date Reported : Feb 07, 2025
Report Number: 3229979-1

Sample Number	2510549-1
Parameter	Noise (Leq 8 hrs.)
Location	Boiler Feed Pump
Measurement Date	Feb 04, 2025
Measurement by	Manassawin Naiyanate

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:31 AM - 09:31 AM	75.8	77.2	75.4
09:31 AM - 10:31 AM	75.5	76.4	75.2
10:31 AM - 11:31 AM	75.4	77.8	75.1
11:31 AM - 12:31 PM	75.5	76.6	75.1
12:31 PM - 01:31 PM	75.8	77.3	75.2
01:31 PM - 02:31 PM	75.3	76.7	75.0
02:31 PM - 03:31 PM	75.1	76.1	74.8
03:31 PM - 04:31 PM	75.2	76.3	74.9
Leq Average 8 hrs. (dB(A))	75.5		
Lmax (dB(A))		77.8	
Standard (dB(A))	85	140	

Reference Method : Based on ISO1996-1 and 1996-2
Standard : Environmental Impact Assessment Report of Gulf JP NK2 Co., Ltd.
ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
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Technical Management
Orawan Rakyong
Scientist (3)

Approved by
Supot Salamteh
Section Head

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2510549
Date Received : Feb 05, 2025
Date Reported : Feb 07, 2025
Report Number: 3229980-1

Sample Number	2510549-2
Parameter	Noise (Leq 8 hrs.)
Location	หอหล่อเย็น (Cooling Tower)
Measurement Date	Feb 04, 2025
Measurement by	Manassawin Naiyanate

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:42 AM - 09:42 AM	82.3	82.9	82.2
09:42 AM - 10:42 AM	82.2	82.6	82.1
10:42 AM - 11:42 AM	81.9	82.3	81.8
11:42 AM - 12:42 PM	81.9	82.4	81.7
12:42 PM - 01:42 PM	81.7	82.2	81.6
01:42 PM - 02:42 PM	81.8	82.9	81.6
02:42 PM - 03:42 PM	81.8	82.3	81.7
03:42 PM - 04:42 PM	81.9	82.2	81.8
Leq Average 8 hrs. (dB(A))	81.9		
Lmax (dB(A))		82.9	
Standard (dB(A))	85	140	

Reference Method : Based on ISO1996-1 and 1996-2
Standard : Environmental Impact Assessment Report of Gulf JP NK2 Co., Ltd.
ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
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Technical Management
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Scientist (3)

Approved by
Supot Salamteh
Section Head

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2510549
Date Received : Feb 05, 2025
Date Reported : Feb 07, 2025
Report Number: 3229981-1

Sample Number	2510549-3
Parameter	Noise (Leq 8 hrs.)
Location	Gas Turbine Generator
Measurement Date	Feb 04, 2025
Measurement by	Manassawin Naiyanate

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:31 AM - 09:31 AM	77.4	80.0	77.2
09:31 AM - 10:31 AM	77.2	78.9	77.0
10:31 AM - 11:31 AM	77.0	79.2	76.8
11:31 AM - 12:31 PM	77.0	80.7	76.8
12:31 PM - 01:31 PM	77.0	80.5	76.7
01:31 PM - 02:31 PM	77.0	79.2	76.9
02:31 PM - 03:31 PM	77.0	79.3	76.8
03:31 PM - 04:31 PM	77.2	79.4	76.9
Leq Average 8 hrs. (dB(A))	77.1		
Lmax (dB(A))		80.7	
Standard (dB(A))	85	140	

Reference Method : Based on ISO1996-1 and 1996-2
Standard : Environmental Impact Assessment Report of Gulf JP NK2 Co., Ltd.
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Technical Management Orawan R.
Orawan Rakyong
Scientist (3)

Approved by Supot S.
Supot Salamteh
Section Head

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2510549
Date Received : Feb 05, 2025
Date Reported : Feb 07, 2025
Report Number: 3229982-1

Sample Number	2510549-4
Parameter	Noise (Leq 8 hrs.)
Location	หน่วยกังหันก๊าซ (Gas Turbine)
Measurement Date	Feb 04, 2025
Measurement by	Manassawin Naiyanate

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:31 AM - 09:31 AM	75.2	78.7	74.2
09:31 AM - 10:31 AM	75.0	80.1	73.8
10:31 AM - 11:31 AM	75.3	78.5	74.0
11:31 AM - 12:31 PM	74.5	78.2	73.3
12:31 PM - 01:31 PM	73.7	77.7	72.5
01:31 PM - 02:31 PM	74.5	78.4	73.5
02:31 PM - 03:31 PM	74.6	77.5	73.7
03:31 PM - 04:31 PM	75.1	77.5	74.0
Leq Average 8 hrs. (dB(A))	74.8		
Lmax (dB(A))		80.1	
Standard (dB(A))	85	140	

Reference Method : Based on ISO1996-1 and 1996-2
Standard : Environmental Impact Assessment Report of Gulf JP NK2 Co., Ltd.
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Technical Management Orawan R.
Orawan Rakyong
Scientist (3)

Approved by Supot S.
Supot Salamteh
Section Head

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2510549
Date Received : Feb 05, 2025
Date Reported : Feb 07, 2025
Report Number: 3229983-1

Sample Number	2510549-5
Parameter	Noise (Leq 8 hrs.)
Location	หน่วยกังหันไอน้ำ (Steam Turbine)
Measurement Date	Feb 04, 2025
Measurement by	Manassawin Naiyanate

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:37 AM - 09:37 AM	84.5	85.6	84.3
09:37 AM - 10:37 AM	84.6	85.5	84.4
10:37 AM - 11:37 AM	84.3	85.4	84.1
11:37 AM - 12:37 PM	84.3	85.3	84.1
12:37 PM - 01:37 PM	83.9	87.0	82.6
01:37 PM - 02:37 PM	82.5	83.6	82.3
02:37 PM - 03:37 PM	82.5	83.8	82.3
03:37 PM - 04:37 PM	84.6	91.8	84.3
Leq Average 8 hrs. (dB(A))	84.0		
Lmax (dB(A))		91.8	
Standard (dB(A))	85	140	

Reference Method : Based on ISO1996-1 and 1996-2
Standard : Environmental Impact Assessment Report of Gulf JP NK2 Co., Ltd.
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Technical Management
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Approved by
Supot Salamteh
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Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2510549
Date Received : Feb 05, 2025
Date Reported : Feb 07, 2025
Report Number: 3229984-1

Sample Number	2510549-6
Parameter	Noise (Leq 8 hrs.)
Location	ชุดอุปกรณ์ลดอุณหภูมิอากาศ (Chiller)
Measurement Date	Feb 04, 2025
Measurement by	Manassawin Naiyanate

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:46 AM - 09:46 AM	68.4	70.4	67.9
09:46 AM - 10:46 AM	67.6	72.6	66.9
10:46 AM - 11:46 AM	67.4	72.8	67.1
11:46 AM - 12:46 PM	67.7	70.5	67.0
12:46 PM - 01:46 PM	67.5	70.9	67.2
01:46 PM - 02:46 PM	67.5	70.3	67.2
02:46 PM - 03:46 PM	67.6	68.8	67.3
03:46 PM - 04:46 PM	67.7	69.1	67.4
Leq Average 8 hrs. (dB(A))	67.7		
Lmax (dB(A))		72.8	
Standard (dB(A))	85	140	

Reference Method : Based on ISO1996-1 and 1996-2
Standard : Environmental Impact Assessment Report of Gulf JP NK2 Co., Ltd.
ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
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Technical Management
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Approved by
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Section Head

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542357
Date Received : May 23, 2025
Date Reported : May 28, 2025
Report Number: 3318408-1

Sample Number	2542357-1
Parameter	Noise (Leq 8 hrs.)
Location	Boiler Feed Pump
Measurement Date	May 22, 2025
Measurement by	Phongsiri Somkaew

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	74.9	76.1	74.5
10:00 AM - 11:00 AM	74.7	75.9	74.4
11:00 AM - 12:00 PM	74.6	76.0	74.3
12:00 PM - 01:00 PM	75.3	76.4	74.7
01:00 PM - 02:00 PM	75.2	76.3	74.8
02:00 PM - 03:00 PM	75.2	76.5	74.9
03:00 PM - 04:00 PM	75.0	80.0	74.5
04:00 PM - 05:00 PM	74.6	75.7	74.3
Leq Average 8 hrs. (dB(A))	74.9		
Lmax (dB(A))		80.0	
Standard (dB(A))	85	140	

Reference Method : Based on ISO1996-1 and 1996-2
Standard : Environmental Impact Assessment Report of Gulf JP NK2 Co., Ltd.
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Technical Management
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Supot Salamteh
Section Head

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542357
Date Received : May 23, 2025
Date Reported : May 28, 2025
Report Number: 3318409-1

Sample Number	2542357-2
Parameter	Noise (Leq 8 hrs.)
Location	หอหล่อเย็น (Cooling Tower)
Measurement Date	May 22, 2025
Measurement by	Phongsiri Somkaew

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	80.7	81.1	80.6
10:00 AM - 11:00 AM	80.5	81.8	80.1
11:00 AM - 12:00 PM	80.0	80.8	79.9
12:00 PM - 01:00 PM	80.5	80.9	80.3
01:00 PM - 02:00 PM	80.1	80.5	80.0
02:00 PM - 03:00 PM	80.3	80.6	80.2
03:00 PM - 04:00 PM	80.3	80.8	80.3
04:00 PM - 05:00 PM	80.4	80.7	80.3
Leq Average 8 hrs. (dB(A))	80.4		
Lmax (dB(A))		81.8	
Standard (dB(A))	85	140	

Reference Method : Based on ISO1996-1 and 1996-2
Standard : Environmental Impact Assessment Report of Gulf JP NK2 Co., Ltd.
ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
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Technical Management
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Scientist (3)

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Section Head

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542357
Date Received : May 23, 2025
Date Reported : May 28, 2025
Report Number: 3318410-1

Sample Number	2542357-3
Parameter	Noise (Leq 8 hrs.)
Location	Gas Turbine Generator
Measurement Date	May 22, 2025
Measurement by	Phongsiri Somkaew

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	78.9	81.3	78.7
10:00 AM - 11:00 AM	79.2	81.2	78.8
11:00 AM - 12:00 PM	78.9	80.6	78.7
12:00 PM - 01:00 PM	78.8	81.2	78.6
01:00 PM - 02:00 PM	78.7	82.2	78.5
02:00 PM - 03:00 PM	78.8	80.4	78.7
03:00 PM - 04:00 PM	78.9	82.2	78.8
04:00 PM - 05:00 PM	79.1	81.5	78.9
Leq Average 8 hrs. (dB(A))	78.9		
Lmax (dB(A))		82.2	
Standard (dB(A))	85	140	

Reference Method : Based on ISO1996-1 and 1996-2
Standard : Environmental Impact Assessment Report of Gulf JP NK2 Co., Ltd.
ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
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Technical Management
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Approved by
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Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542357
Date Received : May 23, 2025
Date Reported : May 28, 2025
Report Number: 3318411-1

Sample Number	2542357-4
Parameter	Noise (Leq 8 hrs.)
Location	หน่วยกังหันก๊าซ (Gas Turbine)
Measurement Date	May 22, 2025
Measurement by	Phongsiri Somkaew

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	74.8	76.5	74.2
10:00 AM - 11:00 AM	74.5	76.4	74.0
11:00 AM - 12:00 PM	74.4	76.5	73.9
12:00 PM - 01:00 PM	73.4	76.5	72.8
01:00 PM - 02:00 PM	74.1	76.7	73.2
02:00 PM - 03:00 PM	74.7	80.8	74.1
03:00 PM - 04:00 PM	75.0	89.6	74.1
04:00 PM - 05:00 PM	74.5	76.0	74.2
Leq Average 8 hrs. (dB(A))	74.4		
Lmax (dB(A))		89.6	
Standard (dB(A))	85	140	

Reference Method : Based on ISO1996-1 and 1996-2
Standard : Environmental Impact Assessment Report of Gulf JP NK2 Co., Ltd.
ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
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Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542357
Date Received : May 23, 2025
Date Reported : May 28, 2025
Report Number: 3318412-1

Sample Number	2542357-5
Parameter	Noise (Leq 8 hrs.)
Location	หน่วยกังหันไอน้ำ (Steam Turbine)
Measurement Date	May 22, 2025
Measurement by	Phongsiri Somkaew

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	82.6	83.9	82.2
10:00 AM - 11:00 AM	82.6	83.1	82.3
11:00 AM - 12:00 PM	82.5	83.0	82.4
12:00 PM - 01:00 PM	83.3	84.8	82.5
01:00 PM - 02:00 PM	82.5	84.7	81.7
02:00 PM - 03:00 PM	82.2	93.9	81.7
03:00 PM - 04:00 PM	82.7	93.4	81.9
04:00 PM - 05:00 PM	85.3	102.0	81.7
Leq Average 8 hrs. (dB(A))	83.1		
Lmax (dB(A))		102.0	
Standard (dB(A))	85	140	

Reference Method : Based on ISO1996-1 and 1996-2
Standard : Environmental Impact Assessment Report of Gulf JP NK2 Co., Ltd.
ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
ในการประกอบกิจการโรงงานเกี่ยวกับสภาวะแวดล้อมในการทำงาน พ.ศ.๒๕๔๖

Technical Management
Orawan Rakyong
Scientist (3)

Approved by
Supot Salamteh
Section Head

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542357
Date Received : May 23, 2025
Date Reported : May 28, 2025
Report Number: 3318413-1

Sample Number	2542357-6
Parameter	Noise (Leq 8 hrs.)
Location	ชุดอุปกรณ์ลดอุณหภูมิอากาศ (Chiller)
Measurement Date	May 22, 2025
Measurement by	Phongsiri Somkaew

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	68.9	70.5	68.5
10:00 AM - 11:00 AM	69.1	70.0	68.7
11:00 AM - 12:00 PM	69.1	70.5	68.9
12:00 PM - 01:00 PM	68.2	70.5	67.7
01:00 PM - 02:00 PM	68.7	70.4	67.8
02:00 PM - 03:00 PM	69.1	72.5	68.9
03:00 PM - 04:00 PM	69.1	73.7	68.8
04:00 PM - 05:00 PM	69.0	70.5	68.7
Leq Average 8 hrs. (dB(A))	68.9		
Lmax (dB(A))		73.7	
Standard (dB(A))	85	140	

Reference Method : Based on ISO1996-1 and 1996-2
Standard : Environmental Impact Assessment Report of Gulf JP NK2 Co., Ltd.
ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย
ในการประกอบกิจการโรงงานเกี่ยวกับสภาวะแวดล้อมในการทำงาน พ.ศ.๒๕๔๖

Technical Management
Orawan Rakyong
Scientist (3)

Approved by
Supot Salamteh
Section Head

ความร้อนในการทำงาน

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2510552
Date Received : Feb 05, 2025
Date Reported : Feb 06, 2025
Report Number: 3225192-1

Sample Number 2510552-1
Parameter Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)
Measurement Date Feb 04, 2025
Measurement by Manassawin Naiyanate
Location ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
หน่วยกังหันก๊าซ (Gas Turbine 11)	120	28.5	25.5	35.5	35.5
Average (WBGT)		28.5			
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. 2561)
2. Ministerial Regulation on Prescribing of Standard for Administration and Management of Occupational Safety, Health and Environmentin relation to Heat,Light and Noise, B.E.2559

Technical Management
Supot Salamteh
Section Head

Approved by
Wichan Choonharat
Assistant Manager

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2510552
Date Received : Feb 05, 2025
Date Reported : Feb 06, 2025
Report Number: 3225192-1

Sample Number 2510552-2
Parameter Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)
Measurement Date Feb 04, 2025
Measurement by Manassawin Naiyanate
Location ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
หน่วยกังหันก๊าซ (Gas Turbine 12)	120	27.5	23.7	37.4	34.0
Average (WBGT)		27.5			
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. 2561)
2. Ministerial Regulation on Prescribing of Standard for Administration and Management of Occupational Safety, Health and Environmentin relation to Heat,Light and Noise, B.E.2559

Technical Management
Supot Salamteh
Section Head

Approved by
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Assistant Manager

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2510552
Date Received : Feb 05, 2025
Date Reported : Feb 06, 2025
Report Number: 3225192-1

Sample Number 2510552-3
Parameter Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)
Measurement Date Feb 04, 2025
Measurement by Manassawin Naiyanate
Location ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
หน่วยกังหันไอน้ำ (Steam Turbine)	120	30.9	28.0	37.7	37.6
Average (WBGT)		30.9			
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 Environmentin relation to Heat,Light and Noise, B.E.2559

Technical Management
Supot Salamteh
Section Head

Approved by
Wichan Choonharat
Assistant Manager

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2510552
Date Received : Feb 05, 2025
Date Reported : Feb 06, 2025
Report Number: 3225192-1

Sample Number 2510552-4
Parameter Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)
Measurement Date Feb 04, 2025
Measurement by Manassawin Naiyanate
Location ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
หม้อไอน้ำ (Boiler Drum 11)	120	28.3	24.5	37.3	36.6
Average (WBGT)		28.3			
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 Environmentin relation to Heat,Light and Noise, B.E.2559

Technical Management
Supot Salamteh
Section Head

Approved by
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Assistant Manager

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2510552
Date Received : Feb 05, 2025
Date Reported : Feb 06, 2025
Report Number: 3225192-1

Sample Number 2510552-5
Parameter Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)
Measurement Date Feb 04, 2025
Measurement by Manassawin Naiyanate
Location ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
หม้อไอน้ำ (Boiler Drum 12)	120	27.8	23.9	37.8	35.3
Average (WBGT)		27.8			
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 Environmentin relation to Heat,Light and Noise, B.E.2559

Technical Management
Supot Salamteh
Section Head

Approved by
Wichan Choonharat
Assistant Manager

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542359
Date Received : May 23, 2025
Date Reported : May 27, 2025
Report Number: 3298772-1

Sample Number 2542359-1
Parameter Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)
Measurement Date May 22, 2025
Measurement by Phongsiri Somkaew
Location ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
หน่วยกังหันก๊าซ (Gas Turbine 11)	120	30.7	27.9	38.5	34.6
Average (WBGT)		30.7			
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 Environmentin relation to Heat,Light and Noise, B.E.2559

Technical Management
Supot Salamteh
Section Head

Approved by
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Assistant Manager

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542359
Date Received : May 23, 2025
Date Reported : May 27, 2025
Report Number: 3298772-1

Sample Number 2542359-2
Parameter Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)
Measurement Date May 22, 2025
Measurement by Phongsiri Somkaew
Location ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
หน่วยกังหันก๊าซ (Gas Turbine 12)	120	30.1	27.5	37.1	34.0
Average (WBGT)		30.1			
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 Environmentin relation to Heat,Light and Noise, B.E.2559

Technical Management
Supot Salamteh
Section Head

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Assistant Manager

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542359
Date Received : May 23, 2025
Date Reported : May 27, 2025
Report Number: 3298772-1

Sample Number 2542359-3
Parameter Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)
Measurement Date May 22, 2025
Measurement by Phongsiri Somkaew
Location ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
หน่วยกังหันไอน้ำ (Steam Turbine)	120	31.1	28.5	38.0	35.2
Average (WBGT)		31.1			
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 Environmentin relation to Heat,Light and Noise, B.E.2559

Technical Management
Supot Salamteh
Section Head

Approved by
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Assistant Manager

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542359
Date Received : May 23, 2025
Date Reported : May 27, 2025
Report Number: 3298772-1

Sample Number 2542359-4
Parameter Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)
Measurement Date May 22, 2025
Measurement by Phongsiri Somkaew
Location ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
หม้อไอน้ำ (Boiler Drum 11)	120	31.4	28.4	39.7	35.9
Average (WBGT)		31.4			
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. 2561)
2. Ministerial Regulation on Prescribing of Standard for Administration and Management of Occupational Safety, Health and Environmentin relation to Heat,Light and Noise, B.E.2559

Technical Management
Supot Salamteh
Section Head

Approved by
Wichan Choonharat
Assistant Manager

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542359
Date Received : May 23, 2025
Date Reported : May 27, 2025
Report Number: 3298772-1

Sample Number 2542359-5
Parameter Heat Stress (Sampling Time : 10.00 AM - 12.00 PM)
Measurement Date May 22, 2025
Measurement by Phongsiri Somkaew
Location ปฏิบัติงาน 1 พื้นที่ (ชื่อ-นามสกุล ผู้ปฏิบัติงาน : - แผนก : -)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
หม้อไอน้ำ (Boiler Drum 12)	120	29.8	27.3	36.7	33.5
Average (WBGT)		29.8			
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 Environmentin relation to Heat,Light and Noise, B.E.2559

Technical Management
Supot Salamteh
Section Head

Approved by
Wichan Choonharat
Assistant Manager

ความเข้มข้นสารเคมีภายในสถานประกอบการ

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2510558
Date Received : Feb 05, 2025
Date Reported : Mar 06, 2025
Report Number : 3242642-1 Rev. No.1

Sample Number	2510558-1
Sampled Date	Feb 04, 2025
Sample Description	Air Quality
Location	หอหล่อเย็น (Cooling Tower)
Date Analysis Commenced	Feb 05, 2025
Condition of Sample	Drawn into one filter paper placed in plastic cassette, one amber plastic bottle and one sorbent tube, refrigerated
Barometric Pressure	761 mmHg
Atmospheric Temperature	27.4 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Chlorine as NaOCl	10:30 AM - 12:30 PM	mg/m3	-	0.30	<0.30	No Standard	Based on OSHA, ID 101	MOL	Bangkok
Sodium hydroxide as NaOH	10:30 AM - 12:30 PM	mg/m3	-	0.05	<0.05	2	NIOSH (1994), 7401	MOL	Bangkok
Sulfuric acid	10:30 AM - 12:30 PM	mg/m3	-	0.05	<0.05	1	Based on OSHA, ID-174-SG	MOL	Bangkok

Guideline :
MOL : Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)

Note : This Analysis test report is reissued to supersede report No.3242642-1, Date Reported : Feb 28, 2025 due to revise analytical information.

Sampled By : Pheeraphong Thongkhunpida

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

Approved by

Sawitree Noisangiam
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.

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2510558
Date Received : Feb 05, 2025
Date Reported : Mar 06, 2025
Report Number : 3242642-1 Rev. No.1

Sample Number	2510558-2
Sampled Date	Feb 04, 2025
Sample Description	Air Quality
Location	หน่วยผลิตน้ำปราศจากแร่ธาตุ (Demin. Water Plant)
Date Analysis Commenced	Feb 05, 2025
Condition of Sample	Drawn into one filter paper placed in plastic cassette, one amber plastic bottle and one sorbent tube, refrigerated
Barometric Pressure	761 mmHg
Atmospheric Temperature	27.2 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Chlorine as NaOCl	10:32 AM - 12:32 PM	mg/m3	-	0.30	<0.30	No Standard	Based on OSHA, ID 101	MOL	Bangkok
Sodium hydroxide as NaOH	10:32 AM - 12:32 PM	mg/m3	-	0.05	<0.05	2	NIOSH (1994), 7401	MOL	Bangkok
Sulfuric acid	10:32 AM - 12:32 PM	mg/m3	-	0.05	<0.05	1	Based on OSHA, ID-174-SG	MOL	Bangkok

Guideline :
MOL : Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)
Note : This Analysis test report is reissued to supersede report No.3242642-1, Date Reported : Feb 28, 2025 due to revise analytical information.

Sampled By : Pheeraphong Thongkhunpida

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

Approved by
Sawitree Noisangiam
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.

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2510558
Date Received : Feb 05, 2025
Date Reported : Mar 06, 2025
Report Number : 3242642-1 Rev. No.1

Sample Number	2510558-3
Sampled Date	Feb 04, 2025
Sample Description	Air Quality
Location	หน่วยเดิมสารเคมีในหม้อน้ำ (Boiler Chemical Dosing Unit)
Date Analysis Commenced	Feb 05, 2025
Condition of Sample	Drawn into one filter paper placed in plastic cassette, one amber plastic bottle and one sorbent tube, refrigerated
Barometric Pressure	761 mmHg
Atmospheric Temperature	27.1 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Chlorine as NaOCl	08:00 AM - 10:00 AM	mg/m3	-	0.30	<0.30	No Standard	Based on OSHA, ID 101	MOL	Bangkok
Sodium hydroxide as NaOH	08:00 AM - 10:00 AM	mg/m3	-	0.05	<0.05	2	NIOSH (1994), 7401	MOL	Bangkok
Sulfuric acid	08:00 AM - 10:00 AM	mg/m3	-	0.05	<0.05	1	Based on OSHA, ID-174-SG	MOL	Bangkok

Guideline :
MOL : Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)
Note : This Analysis test report is reissued to supersede report No.3242642-1, Date Reported : Feb 28, 2025 due to revise analytical information.

Sampled By : Pheeraphong Thongkhunpida

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

Approved by
Sawitree Noisangiam
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.

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2510558
Date Received : Feb 05, 2025
Date Reported : Mar 06, 2025
Report Number : 3242642-1 Rev. No.1

Sample Number	2510558-4
Sampled Date	Feb 04, 2025
Sample Description	Air Quality
Location	Demin plant
Date Analysis Commenced	Feb 05, 2025
Condition of Sample	Drawn into one sorbent tube, refrigerated
Barometric Pressure	761 mmHg
Atmospheric Temperature	27.2 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Hydrogen chloride	10:32 AM - 12:32 PM	ppm	-	0.05	<0.05	5(C)	Based on OSHA, ID-174-SG	MOL	Bangkok

Guideline :
MOL : Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)

Note : This Analysis test report is reissued to supersede report No.3242642-1, Date Reported : Feb 28, 2025 due to revise analytical information.

Sampled By : Pheeraphong Thongkhunpida

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

Approved by
Sawitree Noisangiam
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.

Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2510558
Date Received : Feb 05, 2025
Date Reported : Mar 06, 2025
Report Number : 3242642-1 Rev. No.1

Sample Number	2510558-5
Sampled Date	Feb 04, 2025
Sample Description	Air Quality
Location	Boiler Chemical Dosing
Date Analysis Commenced	Feb 05, 2025
Condition of Sample	Drawn into one filter paper placed in plastic cassette, one amber plastic bottle and two sorbent tubes, refrigerated
Barometric Pressure	761 mmHg
Atmospheric Temperature	27.1 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Ammonia	08:00 AM - 10:00 AM	ppm	-	0.10	<0.10	50	Method of Air Sampling and Analysis, 401	MOL	Bangkok
Cyclohexylamine	08:00 AM - 10:00 AM	ppm	-	0.04	<0.04	10	Based on OSHA, PV2123	MOL	Bangkok
Morpholine	08:00 AM - 10:00 AM	ppm	-	0.02	<0.02	20	Based on OSHA, PV2123	MOL	Bangkok
Metals Testing									
Trisodium phosphate (Na3PO4)	08:00 AM - 10:00 AM	mg/m3	-	0.02	<0.02	No Standard	NIOSH (2003), 7301	-	Bangkok

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Sampled By : Pheeraphong Thongkhunpida

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Manager

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Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2510558
Date Received : Feb 05, 2025
Date Reported : Mar 06, 2025
Report Number : 3242642-1 Rev. No.1

Sample Number	2510558-6
Sampled Date	Feb 04, 2025
Sample Description	Air Quality
Location	Laboratory
Date Analysis Commenced	Feb 05, 2025
Condition of Sample	Drawn into one filter paper placed in plastic cassette, one amber plastic bottle and two sorbent tubes, refrigerated
Barometric Pressure	761 mmHg
Atmospheric Temperature	25.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Ammonia	02:00 PM - 04:00 PM	ppm	-	0.10	<0.10	50	Method of Air Sampling and Analysis, 401	MOL	Bangkok
N,N-Diethyl-p-phenylene diamine	02:00 PM - 04:00 PM	ppm	-	0.2	<0.2	No Standard	Gas Chromatographic (GC/MS)	-	Bangkok
Nitric acid	02:00 PM - 04:00 PM	ppm	-	0.05	<0.05	2	Based on OSHA, ID-174-SG	MOL	Bangkok
Phosphoric acid	02:00 PM - 04:00 PM	mg/m3	-	0.05	<0.05	1	Based on OSHA, ID-174-SG	MOL	Bangkok
Sulfuric acid	02:00 PM - 04:00 PM	mg/m3	-	0.05	<0.05	1	Based on OSHA, ID-174-SG	MOL	Bangkok
Metals Testing									
Trisodium phosphate (Na3PO4)	02:00 PM - 04:00 PM	mg/m3	-	0.02	<0.02	No Standard	NIOSH (2003), 7301	-	Bangkok

Guideline :
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Note : This Analysis test report is reissued to supersede report No.3242642-1, Date Reported : Feb 28, 2025 due to revise analytical information.

Sampled By : Pheeraphong Thongkhunpida

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Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2510558
Date Received : Feb 05, 2025
Date Reported : Mar 06, 2025
Report Number : 3242642-1 Rev. No.1

Sample Number	2510558-7
Sampled Date	Feb 04, 2025
Sample Description	Air Quality
Location	Lab Room
Date Analysis Commenced	Feb 05, 2025
Condition of Sample	Drawn into one sorbent tube, refrigerated
Barometric Pressure	761 mmHg
Atmospheric Temperature	25.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Phosphoric acid	02:00 PM - 04:00 PM	mg/m3	-	0.05	<0.05	1	Based on OSHA, ID-174-SG	MOL	Bangkok
Sulfuric acid	02:00 PM - 04:00 PM	mg/m3	-	0.05	<0.05	1	Based on OSHA, ID-174-SG	MOL	Bangkok

Guideline :
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Sampled By : Pheeraphong Thongkhunpida

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Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542362
Date Received : May 22, 2025
Date Reported : Jun 05, 2025
Report Number : 3298776-1

Sample Number	2542362-1
Sampled Date	May 22, 2025
Sample Description	Air Quality
Location	หอหล่อเย็น (Cooling Tower)
Date Analysis Commenced	May 23, 2025
Condition of Sample	Drawn into one filter paper placed in plastic cassette, one amber plastic bottle and one sorbent tube, refrigerated
Barometric Pressure	754 mmHg
Atmospheric Temperature	35.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Chlorine as NaOCl	10:50 AM - 12:50 PM	mg/m3	-	0.30	<0.30	No Standard	Based on OSHA, ID 101	MOL	Bangkok
Sodium hydroxide as NaOH	10:50 AM - 12:50 PM	mg/m3	-	0.05	<0.05	2	NIOSH (1994), 7401	MOL	Bangkok
Sulfuric acid	10:50 AM - 12:50 PM	mg/m3	-	0.05	<0.05	1	Based on OSHA, ID-174-SG	MOL	Bangkok

Guideline :
MOL : Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)
Sampled By : Phongsiri Somkaew

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

Approved by

Saranya C.

Saranya Chalermthamrong
Scientist (4)

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Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542362
Date Received : May 22, 2025
Date Reported : Jun 05, 2025
Report Number : 3298776-1

Sample Number	2542362-2
Sampled Date	May 22, 2025
Sample Description	Air Quality
Location	หน่วยผลิตน้ำปราศจากแร่ธาตุ (Demin. Water Plant)
Date Analysis Commenced	May 23, 2025
Condition of Sample	Drawn into one filter paper placed in plastic cassette, one amber plastic bottle and one sorbent tube, refrigerated
Barometric Pressure	754 mmHg
Atmospheric Temperature	35.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Chlorine as NaOCl	11:00 AM - 01:00 PM	mg/m3	-	0.30	<0.30	No Standard	Based on OSHA, ID 101	MOL	Bangkok
Sodium hydroxide as NaOH	11:00 AM - 01:00 PM	mg/m3	-	0.05	<0.05	2	NIOSH (1994), 7401	MOL	Bangkok
Sulfuric acid	11:00 AM - 01:00 PM	mg/m3	-	0.05	<0.05	1	Based on OSHA, ID-174-SG	MOL	Bangkok

Guideline :
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Sampled By : Phongsiri Somkaew

Remark :
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Approved by
Saranya C.
Saranya Chalermthamrong
Scientist (4)

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Analysis / Test Report

Client : Gulf JP NK2 Co., Ltd.
189 Moo 7, Nong Plamor, Nong Khae, Saraburi Thailand 18140
P/O : 4109004464
Project Name : Monitoring EIA
Project Location : GNK2

Lot ID: 2542362
Date Received : May 22, 2025
Date Reported : Jun 05, 2025
Report Number : 3298776-1

Sample Number	2542362-3
Sampled Date	May 22, 2025
Sample Description	Air Quality
Location	หน่วยเดิมสารเคมีในหม้อน้ำ (Boiler Chemical Dosing Unit)
Date Analysis Commenced	May 23, 2025
Condition of Sample	Drawn into one filter paper placed in plastic cassette, one amber plastic bottle and one sorbent tube, refrigerated
Barometric Pressure	754 mmHg
Atmospheric Temperature	35.0 °C

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Chlorine as NaOCl	10:45 AM - 12:45 PM	mg/m3	-	0.30	0.54	No Standard	Based on OSHA, ID 101	MOL	Bangkok
Sodium hydroxide as NaOH	10:45 AM - 12:45 PM	mg/m3	-	0.05	<0.05	2	NIOSH (1994), 7401	MOL	Bangkok
Sulfuric acid	10:45 AM - 12:45 PM	mg/m3	-	0.05	<0.05	1	Based on OSHA, ID-174-SG	MOL	Bangkok

Guideline :
MOL : Announcement of the Department of Labour Protection and Welfare on Threshold Limit Values of Hazardous Chemical Substances Dated August 3, B.E. 2560 (2017)
Sampled By : Phongsiri Somkaew

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ภาคผนวก ง

ใบรับรองการสอบเทียบเครื่องมือ

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รายการเครื่องมือที่ใช้ในการวิเคราะห์ / ทดสอบ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Ambient	Particulate Matter (PM-10)	High Volume	BKK_FS1061	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	High Volume	BKK_FS0381	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	High Volume	BKK_FS1063	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	High Volume	BKK_FS1378	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	Digital Balance	BKK_EN0403	3-Jun-24	3-Jun-25	12
Ambient	Total Suspended Particulate	High Volume	BKK_FS0369	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	BKK_FS0363	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	BKK_FS1059	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	BKK_FS1056	-	-	On site Calibration
Ambient	Total Suspended Particulate	Digital Balance	BKK_EN0403	3-Jun-24	3-Jun-25	12
Ambient	Nitrogen Dioxide	NO_2 Analyzer	BKK_FS0782	3-Jan-25	3-Jul-25	6
Ambient	Nitrogen Dioxide	NO_2 Analyzer	BKK_FS0794	3-Jan-25	3-Jul-25	6
Ambient	Nitrogen Dioxide	NO_2 Analyzer	BKK_FS0785	3-Jan-25	3-Jul-25	6
Ambient	Nitrogen Dioxide	NO_2 Analyzer	BKK_FS1070	3-Jan-25	3-Jul-25	6
Ambient	Sulfur Dioxide	SO_2 Analyzer	BKK_FS0781	3-Jan-25	3-Jul-25	6
Ambient	Sulfur Dioxide	SO_2 Analyzer	BKK_FS0793	3-Jan-25	3-Jul-25	6
Ambient	Sulfur Dioxide	SO_2 Analyzer	BKK_FS0784	3-Jan-25	3-Jul-25	6
Ambient	Sulfur Dioxide	SO_2 Analyzer	BKK_FS1069	3-Jan-25	3-Jul-25	6
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	BKK_FS0157	14-Jan-25	14-Jul-26	18
Noise	Leq 24 hrs	Sound Calibrator	BKK_FS0632	16-Jan-25	16-Jan-26	12
Noise	Leq 24 hrs	Sound Level Meter	BKK_FS0115	27-Jan-25	27-Jan-26	12
Noise	Leq 24 hrs	Sound Level Meter	BKK_FS0971	28-Apr-25	28-Apr-26	12
Noise	Leq 24 hrs	Sound Level Meter	BKK_FS0924	9-Jan-25	9-Jan-26	12
Stack	Total Suspended Particulate	Console Control Unit	BKK_FS0448	30-Nov-24	30-May-25	6
Stack	Total Suspended Particulate	Pitot Tube	BKK_FS0552	30-Nov-24	1-Jun-25	6
Stack	Total Suspended Particulate	Digital Balance	BKK_EN0309	5-Nov-24	5-Nov-25	12
Stack	Flow Rate & Temperature	Console Control Unit	BKK_FS0448	30-Nov-24	30-May-25	6
Stack	Flow Rate & Temperature	Pitot Tube	BKK_FS0552	30-Nov-24	1-Jun-25	6
Stack (CEMs)	Oxides of Nitrogen	Analyzer , System calibration, Stand	-	-	-	-
Stack (CEMs)	Sulfur Dioxide	Analyzer , System calibration, Stand	-	-	-	-
Stack (CEMs)	Oxygen	Analyzer , System calibration, Stand	-	-	-	-
Stack (CEMs)	Flow Rate & Temperature	Flow Rate & Temperature Data	-	-	-	-
Water Lab	Residual Free Chlorine	Chlorine Meter	BKK_LG0018	13-Aug-24	13-Aug-25	12
Water Lab	Temperature	pH meter	BKK_LG0004	4-Feb-25	4-Feb-26	12
Water Lab	pH at 25 $^{\circ}C$	pH meter	BKK_EN0342	17-Oct-24	17-Oct-25	12
Water Lab	Oil & Grease	Electronic Top-Loading Balance	BKK_EN0003	2-Aug-24	2-Aug-25	12
Water Lab	Oil & Grease	Water Bath	BKK_EN0439	29-Oct-24	29-Oct-25	12
Water Lab	Total Suspended Solids	Electronic Top-Loading Balance	BKK_EN0003	2-Aug-24	2-Aug-25	12
Water Lab	Total Suspended Solids	Oven	BKK_EN0273	14-May-24	14-Nov-25	18
Water Lab	Total Dissolved Solids 180°C	Electronic Top-Loading Balance	BKK_EN0003	2-Aug-24	2-Aug-25	12
Water Lab	Total Dissolved Solids 180°C	Oven	BKK_EN0273	14-May-24	14-Nov-25	18
Illuminance	Illuminance	Lux Meter	BKK_FS1344	14-Jan-25	14-Jan-26	12
Illuminance	Illuminance	Lux Meter	BKK_FS1345	14-Jan-25	14-Jan-26	12
Noise	Leq 8 hrs	Sound Calibrator	BKK_FS0617	22-Oct-24	22-Oct-25	12
Noise	Leq 8 hrs	Sound Level Meter	BKK_FS0927	21-Jan-25	21-Jan-26	12
Noise	Leq 8 hrs	Sound Level Meter	BKK_FS0995	12-Nov-24	12-Nov-25	12
Noise	Leq 8 hrs	Sound Level Meter	BKK_FS0874	21-Jan-25	21-Jan-26	12
Noise	Leq 8 hrs	Sound Level Meter	BKK_FS0993	19-Sep-24	19-Sep-25	12
Noise	Leq 8 hrs	Sound Level Meter	BKK_FS0875	21-Jan-25	21-Jan-26	12
Noise	Leq 8 hrs	Sound Level Meter	BKK_FS0879	13-Dec-24	13-Dec-25	12
Noise	Leq 8 hrs	Sound Calibrator	BKK_FS0617	22-Oct-24	22-Oct-25	12
Noise	Leq 8 hrs	Sound Level Meter	BKK_FS0996	23-Aug-24	23-Aug-25	12
Noise	Leq 8 hrs	Sound Level Meter	BKK_FS0110	13-Dec-24	13-Dec-25	12

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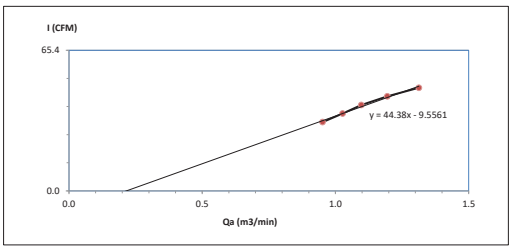
รายการเครื่องมือที่ใช้ในการวิเคราะห์ / ทดสอบ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Noise	Leq 8 hrs	Sound Level Meter	BKK_FS1218	3-Dec-24	3-Dec-25	12
Noise	Leq 8 hrs	Sound Level Meter	BKK_FS1222	23-Dec-24	23-Dec-25	12
Noise	Leq 8 hrs	Sound Level Meter	BKK_FS1215	3-Dec-24	3-Dec-25	12
Noise	Leq 8 hrs	Sound Level Meter	BKK_FS0995	12-Nov-24	12-Nov-25	12
Heat	Heat Stress	Heat Stress Monitor	BKK_FS0651	17-May-24	17-May-25	12
Heat	Heat Stress	Heat Stress Monitor	BKK_FS0640	3-May-24	2-May-25	12
Heat	Heat Stress	Heat Stress Monitor	BKK_FS0652	16-Dec-24	16-Dec-25	12
Heat	Heat Stress	Heat Stress Monitor	BKK_FS0669	19-Jul-24	19-Jul-25	12
Heat	Heat Stress	Heat Stress Monitor	BKK_FS0643	17-May-24	17-May-25	12
Heat	Heat Stress	Heat Stress Monitor	BKK_FS0681	22-Nov-24	22-Nov-25	12
Heat	Heat Stress	Heat Stress Monitor	BKK_FS0669	19-Jul-24	19-Jul-25	12
Heat	Heat Stress	Heat Stress Monitor	CHM_FS0103	5-Jun-24	5-Jun-25	12
Heat	Heat Stress	Heat Stress Monitor	BKK_FS0653	16-Dec-24	16-Dec-25	12
Heat	Heat Stress	Heat Stress Monitor	BKK_FS0644	3-Sep-24	3-Sep-25	12
Workplace	Sodium hydroxide as NaOH	DRYCAL FLOWMETER	BKK_FS0614	9-Sep-24	9-Sep-25	12
Workplace	Sodium hydroxide as NaOH	DRYCAL FLOWMETER	BKK_FS0619	9-Sep-24	9-Sep-25	12
Workplace	Sodium hydroxide as NaOH	Air Sampling Pump	BKK_FS0349	2-Dec-24	2-Mar-25	3
Workplace	Sodium hydroxide as NaOH	Air Sampling Pump	BKK_FS0355	2-Dec-24	2-Mar-25	3
Workplace	Sodium hydroxide as NaOH	Air Sampling Pump	CHM_FS0024	14-May-25	14-Aug-25	3
Workplace	Sodium hydroxide as NaOH	Air Sampling Pump	CHM_FS0020	14-May-25	14-Aug-25	3
Workplace	Sodium hydroxide as NaOH	Air Sampling Pump	CHM_FS0017	25-Feb-25	25-May-25	3
Workplace	Sulfuric Acid	DRYCAL FLOWMETER	BKK_FS0614	9-Sep-24	9-Sep-25	12
Workplace	Sulfuric Acid	DRYCAL FLOWMETER	BKK_FS0619	9-Sep-24	9-Sep-25	12
Workplace	Sulfuric Acid	Air Sampling Pump	BKK_FS0348	2-Dec-24	2-Mar-25	3
Workplace	Sulfuric Acid	Air Sampling Pump	BKK_FS0354	2-Dec-24	2-Mar-25	3
Workplace	Sulfuric Acid	Air Sampling Pump	CHM_FS0023	14-May-25	14-Aug-25	3
Workplace	Sulfuric Acid	Air Sampling Pump	CHM_FS0019	25-Feb-25	25-May-25	3
Workplace	Sulfuric Acid	Air Sampling Pump	CHM_FS0018	25-Feb-25	25-May-25	3
Workplace	Sulfuric Acid	Ion Chromatography	BKK_EN0069	12-Jan-24	12-Jul-25	18
Workplace	Chlorine	DRYCAL FLOWMETER	BKK_FS0614	9-Sep-24	9-Sep-25	12
Workplace	Chlorine	DRYCAL FLOWMETER	BKK_FS0619	9-Sep-24	9-Sep-25	12
Workplace	Chlorine	Air Sampling Pump	BKK_FS0352	2-Dec-24	2-Mar-25	3
Workplace	Chlorine	Air Sampling Pump	BKK_FS0353	2-Dec-24	2-Mar-25	3
Workplace	Chlorine	Air Sampling Pump	CHM_FS0016	25-Feb-25	25-May-25	3
Workplace	Chlorine	Air Sampling Pump	CHM_FS0022	25-Feb-25	25-May-25	3
Workplace	Chlorine	Air Sampling Pump	CHM_FS0015	25-Feb-25	25-May-25	3

High Volume Air Sampler Calibration Worksheet

Project Site :	Gulf JP NK2 Co.,Ltd	**Barometric Pressure (mm Hg) :**	755.8
Calibrate Location :	บ้านโป่งแร่ง	**Temperature (°C) :**	32.4
Calibrate Date :	16-May-25	**High Volume ID :**	BKK_FS1061
CalibrationSheet No.:	**C-160525-BKK_FS1061**	**High Volume Model :**	TE-5009X
Calibrator ID:	BKK_FS0625	**High Volume S/N :**	5504
Calibrator Model :	TE-5028A	**Calibrator Slope :**	1.04803
Calibrator S/N :	2585	**Calibrator Intercept :**	-0.01206

Test No.	Delta H_2O (inch)	Qa (m^3/min)	I : Chart (CFM)	Linear Regression	
1	2.4	0.952	32	Slope :	44.3803
2	2.8	1.027	36	Intercept :	-9.5561
3	3.2	1.097	40	Correlation Coefficient :	0.9937
4	3.8	1.194	44		
5	4.6	1.313	48		



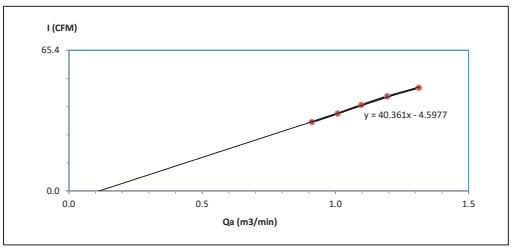
Calibrated by Vanich P. (Mr.Vanich Phanpipit)
Field Scientist(3)

Approved by : (Mr. Noppong Juntarupan)
Enviro Field Coordinator Scientist (3)

High Volume Air Sampler Calibration Worksheet

Project Site :	Gulf JP NK2 Co.,Ltd	**Barometric Pressure (mm Hg) :**	755.8
Calibrate Location :	วัดบัวลอย	**Temperature (°C) :**	32.4
Calibrate Date :	16-May-25	**High Volume ID :**	BKK_FS0381
CalibrationSheet No.:	**C-160525-BKK_FS0381**	**High Volume Model :**	TE-5009X
Calibrator ID:	BKK_FS0625	**High Volume S/N :**	4161
Calibrator Model :	TE-5028A	**Calibrator Slope :**	1.04803
Calibrator S/N :	2585	**Calibrator Intercept :**	-0.01206

Test No.	Delta H_2O (inch)	Qa (m^3/min)	I : Chart (CFM)	Linear Regression	
1	2.2	0.912	32	Slope :	40.3612
2	2.7	1.009	36	Intercept :	-4.5977
3	3.2	1.097	40	Correlation Coefficient :	0.9986
4	3.8	1.194	44		
5	4.6	1.313	48		



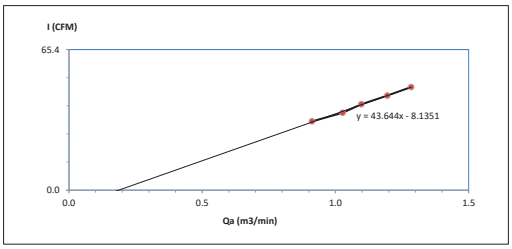
Calibrated by Vanich P. (Mr.Vanich Phanpipit)
Field Scientist(3)

Approved by : (Mr. Noppong Juntarupan)
Enviro Field Coordinator Scientist (3)

High Volume Air Sampler Calibration Worksheet

Project Site :	Gulf JP NK2 Co.,Ltd	**Barometric Pressure (mm Hg) :**	755.8
Calibrate Location :	โรงเรียนบ้านทุ่งดินขอ	**Temperature (°C) :**	32.4
Calibrate Date :	16-May-25	**High Volume ID :**	BKK_FS1063
CalibrationSheet No.:	**C-160525-BKK_FS1063**	**High Volume Model :**	TE-5009X
Calibrator ID:	BKK_FS0625	**High Volume S/N :**	5685
Calibrator Model :	TE-5028A	**Calibrator Slope :**	1.04803
Calibrator S/N :	2585	**Calibrator Intercept :**	-0.01206

Test No.	Delta H_2O (inch)	Qa (m^3/min)	I : Chart (CFM)	Linear Regression	
1	2.2	0.912	32	Slope :	43.6439
2	2.8	1.027	36	Intercept :	-8.1351
3	3.2	1.097	40	Correlation Coefficient :	0.9979
4	3.8	1.194	44		
5	4.4	1.284	48		



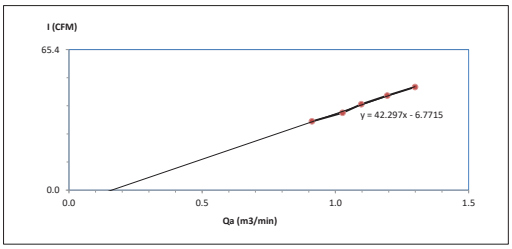
Calibrated by Vanich P. (Mr.Vanich Phanpipit)
Field Scientist(3)

Approved by : (Mr. Noppong Juntarupan)
Enviro Field Coordinator Scientist (3)

High Volume Air Sampler Calibration Worksheet

Project Site :	Gulf JP NK2 Co.,Ltd	**Barometric Pressure (mm Hg) :**	755.8
Calibrate Location :	โรงเรียนวัดหนองปลาหมอ	**Temperature (°C) :**	32.4
Calibrate Date :	16-May-25	**High Volume ID :**	BKK_FS1378
CalibrationSheet No.:	**C-160525-BKK_FS1378**	**High Volume Model :**	TE-5009X
Calibrator ID:	BKK_FS0625	**High Volume S/N :**	6263
Calibrator Model :	TE-5028A	**Calibrator Slope :**	1.04803
Calibrator S/N :	2585	**Calibrator Intercept :**	-0.01206

Test No.	Delta H_2O (inch)	Qa (m^3/min)	I : Chart (CFM)	Linear Regression	
1	2.2	0.912	32	Slope :	42.2973
2	2.8	1.027	36	Intercept :	-6.7715
3	3.2	1.097	40	Correlation Coefficient :	0.9978
4	3.8	1.194	44		
5	4.5	1.299	48		



Calibrated by Vanich P. (Mr.Vanich Phanpipit)
Field Scientist(3)

Approved by : (Mr. Noppong Juntarupan)
Enviro Field Coordinator Scientist (3)

PLAY SOLUTION TECHNOLOGY COMPANY LIMITED
179/75 Nawong Pracha Pattana Road, Sikan, Donmuang, Bangkok 10210
Tel.:+66 2 011 0505, Fax:+66 2 010 7700
www.playsotec.com

NSC-TISI-TIS17025 CALIBRATION 0378

CERTIFICATE OF CALIBRATION

Certificate No. : PST-0126-24 W/O No. : WO-0051-24

Customer

Company : ALS LABORATORY GROUP (THAILAND) CO., LTD.
Address : 104 Phatthanakan 40, Phatthanakan Road, Khwaeng Phatthanakan,
City / Province : Khet Suan Luang, Bangkok
Zip/Postal : 10250

Device

Equipment : Electronic Balance Capacity : 120 / 220 g
Manufacturer : OHAUS Readability : 0.00001 / 0.0001 g
Model : EX225D/AD ID No. : BKK_EN0403
Serial No. : C309774648
Condition : Normal

Environment Conditions

Location of Calibration : Enviroment Lab
Ambient Temperature : 20.1 (°C) ± 3 °C
Relative Humidity : 70.3 (%RH) ± 15 %RH
Barometric Pressure : 1011.1 (mba) ± 10 hPa
Comment :

REVIEW BY Linda K.
APPROVED BY Siriluk P.
NEXT CAL. DATE 03/06/25

Date of Receipt : June 3, 2024
Date of Calibration : June 3, 2024
Issue Date : June 5, 2024

Calibrated by : Mr.Kittichai Rattanathum
Calibrator

Approved by (Mr.Kittichai Rattanatham)
Approved Signatore

The reported measurement result relates only to the measurand and applies only at the time of measurement.

This Certificate is issued in accordance with the conditions of accreditation granted by Thai Laboratory Accreditation scheme which has assessed the measurement capability of the laboratory and is traceability to recognize national standards and to the unit 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 prior written approval of the calibration center, Play Solution Technology Co.,Ltd

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NSC-TISI-TIS17025 CALIBRATION 0378

CERTIFICATE OF CALIBRATION

Certificate No. : PST-0126-24 W/O No. : WO-0051-24

Result of Calibration : Without Adjustment

1. Repeatability

Weighing Range 1 g	Nominal Value g	Standard Deviation g
Max.capacity 220	50	0.000012
	200	0.000049

2.Linearity, Departure of Indication from nominal value

Weighing Range 1

Nominal Value g	Standard Value g	Indication g	Error of Indication g	Expanded Uncertainty g	Factor k
0.01	0.01000	0.01000	-0.000001	0.000082	2.87
0.1	0.10001	0.10001	0.000004	0.000082	2.87
0.5	0.50000	0.50001	0.000012	0.00008	2.87
1	1.00001	1.00002	0.000013	0.00008	2.87
5	5.00002	5.00003	0.000009	0.00008	2.52
10	9.99999	9.99999	-0.000001	0.00008	2.28
50	50.00001	49.99998	-0.000027	0.00016	2.00
100	100.00002	100.00002	0.000004	0.00030	2.00
150	150.00002	150.0001	0.000077	0.00045	2.00
200	200.00003	200.0001	0.000068	0.00060	2.00

F-039 REV.03 30/08/66

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179/75 Nawong Pracha Pattana Road, Sikan, Donmuang, Bangkok 10210
Tel.:+66 2 011 0505, Fax:+66 2 010 7700
www.playsotec.com

NSC-TISI-TIS17025 CALIBRATION 0378

CERTIFICATE OF CALIBRATION

Certificate No. : PST-0126-24 W/O No. : WO-0051-24

Result of Calibration

3.Eccentricity

Test load at least 1/3 of the maximum capacity, typically placed between 1/2 and 1/3 of the distance from the centre of the load receptor to the edge.

Weighing Range 1
Test Load : 100 g

Position	Indication g
1	100.00004
2	100.00005
3	100.00002
4	100.00004
5	100.00003
Max.Deviation	0.00002

Standard method

The calibration was performed by using calibration laboratory's in-house calibration method : CP-M-001 based on "LIKAS LAB 14 : Calibration of weighing machine" : edition 6 | October 2019

Reference standards instrument

Instriment	OIML Class	S/N	Certificate No.	Due Date
Standard Weight Set	E2	4000021952	22-128725	November 30, 2024
Standard Weight Set	-	-	-	-
Standard Weight Set	-	-	-	-
Standard Weight Set	-	-	-	-

Measurement Uncertainty

The given measurement uncertainty is the standard of the measurement multiplied by an extension factor k which corresponds to a confidence level of about 95% for a normal distribution. The standard uncertainty was calculated according to UKAS M3003.

Traceability : The measurement is traceable to national standard, which realize the physical unit of measurement (SI)
- Through the reference calibration laboratory of Asia Medical and Agricultural Laboratory and Research Center Co.,Ltd

END OF REPORT

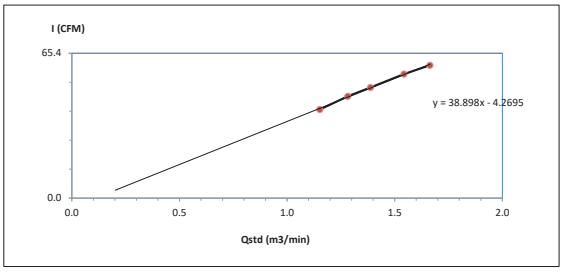
F-039 REV.03 30/08/66

ALS

High Volume Air Sampler Calibration Worksheet

Project Site :	Gulf JP NK2 Co.,Ltd	**Barometric Pressure (mm Hg) :**	755.8
Calibrate Location :	บ้านโป่งแร่ง	**Temperature (°C) :**	32.4
Calibrate Date :	16-May-25	**High Volume ID :**	BKK_FS0369
CalibrationSheet No.:	C-160525-BKK_FS0369	**High Volume Model :**	TE-5009X
Calibrator ID:	BKK_FS0625	**High Volume S/N :**	4166
Calibrator Model :	TE-5028A	**Calibrator Slope :**	1.67329
Calibrator S/N :	2585	**Calibrator Intercept :**	-0.01925

Test No.	Delta H_2O (inch)	Q_{std} (m^3/min)	I : Chart (CFM)	Linear Regression
1	3.7	1.1516	40	Slope : 38.8982
2	4.6	1.2819	46	Intercept : -4.2695
3	5.4	1.3873	50	Correlation Coefficient : 0.9984
4	6.7	1.5431	56	
5	7.8	1.6634	60	



Calibrated by Vanich P.
(Mr.Vanich Phanpipit)
Field Scientist(3)

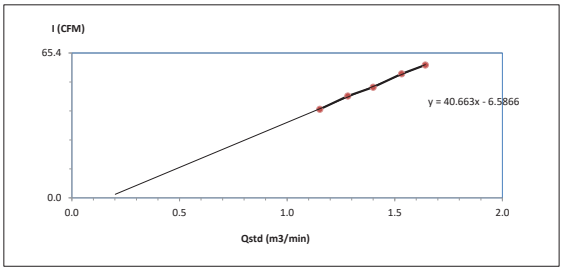
Approved by :
(Mr. Noppong Juntarupan)
Enviro Field Coordinator Scientist (3)

FORM NO.: F 06-073 REVISION NO.:2 ISSUE DATE: 20/11/23

High Volume Air Sampler Calibration Worksheet

Project Site :	Gulf JP NK2 Co.,Ltd	**Barometric Pressure (mm Hg) :**	755.8
Calibrate Location :	วัดบัวลอย	**Temperature (°C) :**	32.4
Calibrate Date :	16-May-25	**High Volume ID :**	BKK_FS0363
CalibrationSheet No.:	C-160525-BKK_FS0363	**High Volume Model :**	TE-5009X
Calibrator ID:	BKK_FS0625	**High Volume S/N :**	4160
Calibrator Model :	TE-5028A	**Calibrator Slope :**	1.67329
Calibrator S/N :	2585	**Calibrator Intercept :**	-0.01925

Test No.	Delta H_2O (inch)	Q_{std} (m^3/min)	I : Chart (CFM)	Linear Regression
1	3.7	1.1516	40	Slope : 40.6626
2	4.6	1.2819	46	Intercept : -6.5866
3	5.5	1.3999	50	Correlation Coefficient : 0.9990
4	6.6	1.5317	56	
5	7.6	1.6422	60	



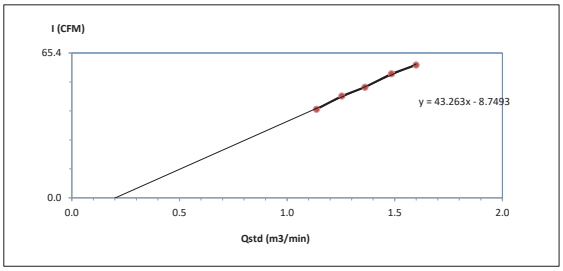
Calibrated by Vanich P.
(Mr.Vanich Phanpipit)
Field Scientist(3)

Approved by :
(Mr. Noppong Juntarupan)
Enviro Field Coordinator Scientist (3)

High Volume Air Sampler Calibration Worksheet

Project Site :	Gulf JP NK2 Co.,Ltd	**Barometric Pressure (mm Hg) :**	755.8
Calibrate Location :	โรงเรียนบ้านทุ่งดินขอ	**Temperature (°C) :**	32.4
Calibrate Date :	16-May-25	**High Volume ID :**	BKK_FS1059
CalibrationSheet No.:	C-160525-BKK_FS1059	**High Volume Model :**	TE-5009X
Calibrator ID:	BKK_FS0625	**High Volume S/N :**	5693
Calibrator Model :	TE-5028A	**Calibrator Slope :**	1.67329
Calibrator S/N :	2585	**Calibrator Intercept :**	-0.01925

Test No.	Delta H_2O (inch)	Q_{std} (m^3/min)	I : Chart (CFM)	Linear Regression
1	3.6	1.1362	40	Slope : 43.2627
2	4.4	1.2541	46	Intercept : -8.7493
3	5.2	1.3617	50	Correlation Coefficient : 0.9983
4	6.2	1.4851	56	
5	7.2	1.5989	60	



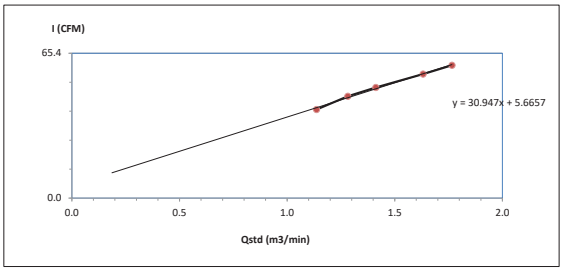
Calibrated by Vanich P.
(Mr.Vanich Phanpipit)
Field Scientist(3)

Approved by :
(Mr. Noppong Juntarupan)
Enviro Field Coordinator Scientist (3)

High Volume Air Sampler Calibration Worksheet

Project Site :	Gulf JP NK2 Co.,Ltd	**Barometric Pressure (mm Hg) :**	755.8
Calibrate Location :	โรงเรียนวัดหนองปลาหมอ	**Temperature (°C) :**	32.4
Calibrate Date :	16-May-25	**High Volume ID :**	BKK_FS1056
CalibrationSheet No.:	C-160525-BKK_FS1056	**High Volume Model :**	TE-5009X
Calibrator ID:	BKK_FS0625	**High Volume S/N :**	5499
Calibrator Model :	TE-5028A	**Calibrator Slope :**	1.67329
Calibrator S/N :	2585	**Calibrator Intercept :**	-0.01925

Test No.	Delta H_2O (inch)	Q_{std} (m^3/min)	I : Chart (CFM)	Linear Regression
1	3.6	1.1362	40	Slope : 30.9469
2	4.6	1.2819	46	Intercept : 5.6657
3	5.6	1.4124	50	Correlation Coefficient : 0.9967
4	7.5	1.6315	56	
5	8.8	1.7656	60	



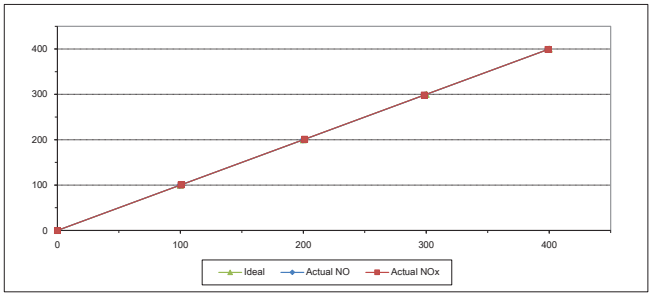
Calibrated by Vanich P.
(Mr.Vanich Phanpipit)
Field Scientist(3)

Approved by :
(Mr. Noppong Juntarupan)
Enviro Field Coordinator Scientist (3)

MULTIPOINT CALIBRATION REPORT

Calibration Date	3-Jan-25	**Equipment Name**	NOx Analyzer
Manufacturer	HORIBA	**Model**	APNA-370
Serial No.	WPY0JMWD	**Equipment ID**	BKK_FS0782
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	100.60	0.60	0.60
2	200.00	199.70	-0.30	-0.15	201.10	1.10	0.55
3	300.00	298.70	-1.30	-0.43	298.50	-1.50	-0.50
4	400.00	398.70	-1.30	-0.33	399.10	-0.90	-0.22
AVERAGE (%)				-0.24			0.10



Calibrated By
(Mr.Jirawut Sakarn)
Field Environmental Scientist (3)

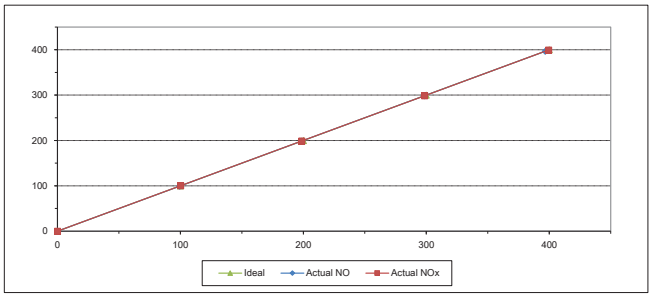
Approved By
(Mr.Sarayuth Jittranont)
Assistant General Manager

ALS Laboratory Group

MULTIPOINT CALIBRATION REPORT

Calibration Date	3-Jan-25	Equipment Name	NOx Analyzer
Manufacturer	HORIBA	Model	APNA-370
Serial No.	R0A0GWJC	Equipment ID	BKK_FS0794
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	99.40	-0.60	-0.60	100.20	0.20	0.20
2	200.00	198.50	-1.50	-0.75	198.80	-1.20	-0.60
3	300.00	298.50	-1.50	-0.50	298.70	-1.30	-0.43
4	400.00	396.70	-3.30	-0.83	399.50	-0.50	-0.13
AVERAGE (%)				-0.51			-0.17



Calibrated By

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

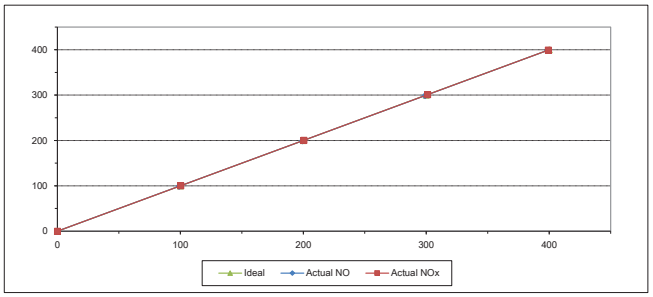
Approved By

(Mr.Sarayuth Jittranont)
Assistant General Manager

MULTIPOINT CALIBRATION REPORT

Calibration Date	3-Jan-25	Equipment Name	NOx Analyzer
Manufacturer	HORIBA	Model	APNA-370
Serial No.	TLTATGDW	Equipment ID	BKK_FS0785
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	99.00	-1.00	-1.00	100.30	0.30	0.30
2	200.00	199.40	-0.60	-0.30	200.50	0.50	0.25
3	300.00	299.00	-1.00	-0.33	301.10	1.10	0.37
4	400.00	398.70	-1.30	-0.33	399.30	-0.70	-0.17
AVERAGE (%)				-0.37			0.17



Calibrated By

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

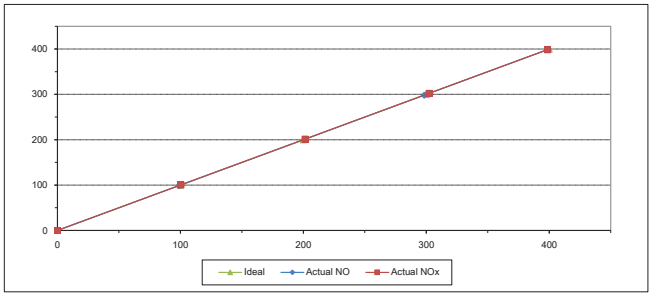
Approved By

(Mr.Sarayuth Jittranont)
Assistant General Manager

MULTIPOINT CALIBRATION REPORT

Calibration Date	3-Jan-25	Equipment Name	NOx Analyzer
Manufacturer	HORIBA	Model	APNA-370
Serial No.	PPGM9HKH	Equipment ID	BKK_FS1070
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	98.80	-1.20	-1.20	100.50	0.50	0.50
2	200.00	201.30	1.30	0.65	201.40	1.40	0.70
3	300.00	298.30	-1.70	-0.57	302.30	2.30	0.77
4	400.00	398.80	-1.20	-0.30	398.60	-1.40	-0.35
AVERAGE (%)				-0.26			0.34



Calibrated By

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

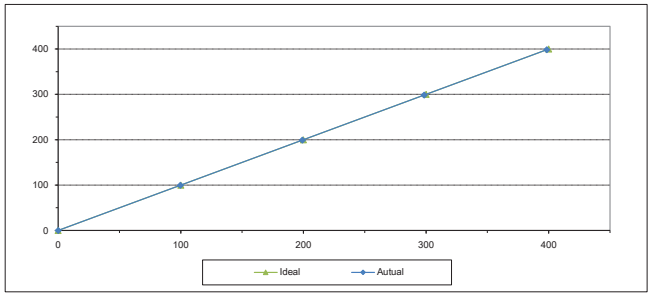
Approved By

(Mr.Sarayuth Jittranont)
Assistant General Manager

MULTIPOINT CALIBRATION REPORT

Calibration Date	3-Jan-25	Equipment Name	SO2 Analyzer
Manufacturer	HORIBA	Model	APSA-370
Serial No.	Y53SNSFB	Equipment ID	BKK_FS0781
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	56.3	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	Autual	Error	%Error
ZERO	0.00	0.10	0.10	0.10
1	100.00	99.70	-0.30	-0.30
2	200.00	199.20	-0.80	-0.40
3	300.00	298.50	-1.50	-0.50
4	400.00	398.50	-1.50	-0.38
AVERAGE (%)				-0.30



Calibrated By

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

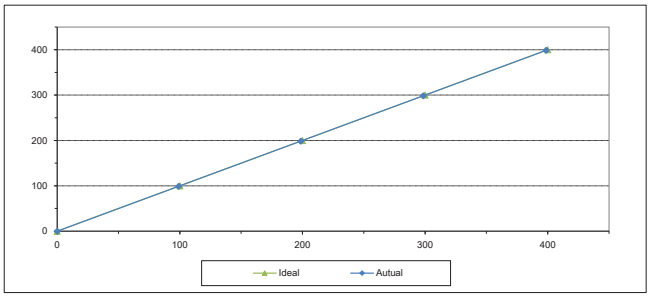
Approved By

(Mr.Sarayuth Jittranont)
Assistant General Manager

MULTIPOINT CALIBRATION REPORT

Calibration Date	3-Jan-25	Equipment Name	SO2 Analyzer
Manufacturer	HORIBA	Model	APSA-370
Serial No.	2BGDABSF	Equipment ID	BKK_FS0793
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	56.3	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	Autual	Error	%Error
ZERO	0.00	0.10	0.10	0.10
1	100.00	99.10	-0.90	-0.90
2	200.00	198.70	-1.30	-0.65
3	300.00	298.50	-1.50	-0.50
4	400.00	398.70	-1.30	-0.33
AVERAGE (%)				-0.46



Calibrated By

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

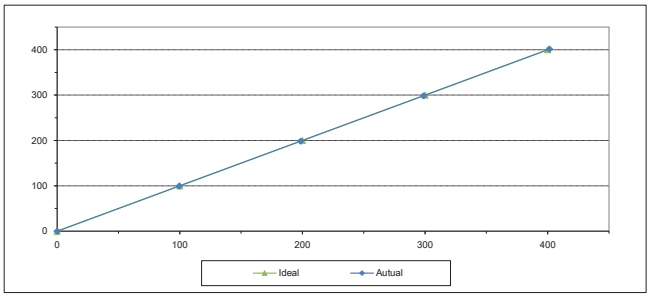
Approved By

(Mr.Sarayuth Jittranont)
Assistant General Manager

MULTIPOINT CALIBRATION REPORT

Calibration Date	3-Jan-25	Equipment Name	SO2 Analyzer
Manufacturer	HORIBA	Model	APSA-370
Serial No.	3C72K8HB	Equipment ID	BKK_FS0784
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	56.3	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	Autual	Error	%Error
ZERO	0.00	0.10	0.10	0.10
1	100.00	99.60	-0.40	-0.40
2	200.00	198.60	-1.40	-0.70
3	300.00	298.70	-1.30	-0.43
4	400.00	401.50	1.50	0.38
AVERAGE (%)				-0.21



Calibrated By

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

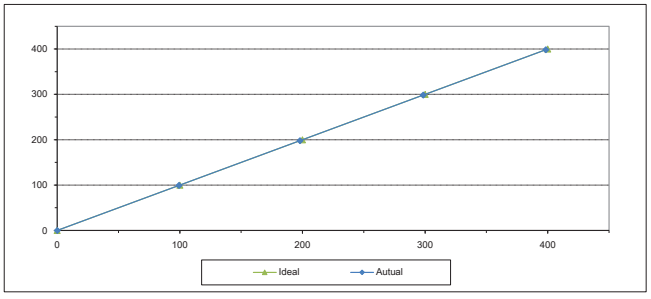
Approved By

(Mr.Sarayuth Jittranont)
Assistant General Manager

MULTIPOINT CALIBRATION REPORT

Calibration Date	3-Jan-25	Equipment Name	SO2 Analyzer
Manufacturer	HORIBA	Model	APSA-370
Serial No.	70Y1R8R0	Equipment ID	BKK_FS1069
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947		
Std. Gas Concentration (PPM)	56.3	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	Autual	Error	%Error
ZERO	0.00	0.10	0.10	0.10
1	100.00	99.30	-0.70	-0.70
2	200.00	198.00	-2.00	-1.00
3	300.00	298.50	-1.50	-0.50
4	400.00	398.50	-1.50	-0.38
AVERAGE (%)				-0.50



Calibrated By

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

Approved By

(Mr.Sarayuth Jittranont)
Assistant General Manager

JNAC
JIRANATEE ASSOCIATES CO.,LTD.

Jiranatee Associates Co.,Ltd.
63/14-15, 67/35-36
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Bangkok 10600 (Thailand)
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Mobile: +6686 3995453
E-mail: jnac.calibration@jiranatee.com
Web site: www.jiranatep.com

Accredited calibration laboratory
ISO/IEC 17025:2017
NSC-TISI-TIS 17025
CALIBRATION 0367

Air speed measurement laboratory
Calibration services department.

ilac-MRA
NSC – TISI – TIS 17025
CALIBRATION 0367

Certificate Number
CWS-001-68

CERTIFICATE OF CALIBRATION

Page 1 of 2 Pages

MEASUREMENT ITEM	: Cup anemometer
MANUFACTURER	: Novalynx
MODEL/TYPE	: Sensor: WS-02F Data logger: 200-WS-2SLB
SERIAL NUMBER	: Sensor: WSD-A4596 Data logger: A4596
ID NUMBER	: BKK_FS0157
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	: 10 Jan 2025
MEASUREMENT DATE	: 14 Jan 2025
ISSUE DATE	: 16 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
Atmospheric Pressure	: 1010± 10	hPa

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

CALIBRATION CONDITIONS

: Wind tunnel cross-section area[1]	900	cm²
Wind direction frontal area[2]	100	cm²
Diameter of mounting pipe[3]	-	mm
Blockage ratio of test object[4]	0.111	[-]

Preconditioning : 24 hours at ambient conditions.
Measurement Condition : The average values during measurement are (24.7) °C, (52.3) %RH and (1013.7) hPa.

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

Calibrated by:
[X] Mr. Sorawit Thadinlad
[ ] Miss Atrapeen Lertboonsai

JNAC
JIRANATEE ASSOCIATES CO.,LTD.

Approved signatory
Mr. Pirinya Bonchanoon
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 [2] to [1]

Calibration procedure:
The Cup anemometer was calibrated against Standard air velocity transducer model: 8455S12 and pitot tube with precision differential pressure meter model: DPM2500 in an close test section of Eiffel-type wind tunnel with 900 cm² cross test section area. The WI-CL-007 based on IEC 61400-12-1, Wind energy generation 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 0007-24 and MW 0065-24

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'

REVIEW BY
APPROVED BY
NEXT CAL DATE 14/07/26

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

Certificate Number
CWS-001-68

MEASUREMENT RESULTS [5]

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} [4] (m/s)	Temp. wind tunnel (°C)	Temp. room (°C)	v_{uuc} [3] (m/s)	Error (m/s)	U (k=2) (m/s)
0.986	24.28	24.65	0.9	-0.1	0.31
2.214	24.86	24.65	2.1	-0.1	0.31
3.010	24.44	24.65	3.0	0.0	0.31
4.239	24.40	24.65	4.3	-0.1	0.31
4.95	24.42	24.65	5.1	0.1	0.46
5.97	24.42	24.65	6.1	0.1	0.31
7.10	24.28	24.65	7.2	0.1	0.31
7.96	24.48	24.65	8.2	0.2	0.31
8.98	24.20	24.65	9.2	0.2	0.31
9.97	24.60	24.65	10.3	0.4	0.37
11.09	24.30	24.65	11.5	0.4	0.46
12.01	24.58	24.65	12.4	0.4	0.45
13.04	24.36	24.65	13.5	0.5	0.31
13.99	24.56	24.65	14.5	0.5	0.46
15.03	24.34	24.65	15.5	0.5	0.44
15.97	24.40	24.65	16.6	0.6	0.41

Remark:

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

[4] 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

JNAC JIRANATEE ASSOCIATES CO.,LTD.

Jiranatee Associates Co.,Ltd
60/19-15, 60/95-96
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Bangkok 10600 (Thailand)
Tel: +66868898312
Mobile: +66869995453
E-mail: jnac-calibration@jiranatee.com
Web site: www.jiranatee.com

Accredited calibration laboratory
ISO/IEC 17025:2017
NSC-TISI-TIS 17025
CALIBRATION 0367

Wind direction measurement laboratory
Calibration services department.

NSC – TISI – TIS 17025
CALIBRATION 0367

Certificate Number
CWD-001-68

CERTIFICATE OF CALIBRATION

MEASUREMENT ITEM	: Wind Direction Sensor
MANUFACTURER	: Novalynx
MODEL/TYPE	: Sensor: WS-02F Data logger: 200-WS-25UI
SERIAL NUMBER	: Sensor: WSD-A4596 Data logger: A4596
ID NUMBER	: BKK_FS01S7
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	: 10 Jan 2025
MEASUREMENT DATE	: 14 Jan 2025
ISSUE DATE	: 16 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
Atmospheric Pressure	: 1010 ± 10	hPa

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

CALIBRATION CONDITION

Wind tunnel cross-section area[1]	900	cm^2
Wind direction frontal area[2]	129	cm^2
Diameter of mounting pipe[3]	-	mm
Blockage ratio of test object[4]	0.143	[-]

Preconditioning : 24 hours at ambient conditions.
Measurement Condition : The average values during measurement are (24.2)°C, (62.7) %RH and (1012.5) hPa.

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

Calibrated by:
☑ Mr. Sorawit Thabnabid
☐ Miss Jittraporn Lertsomphol

Approved signatory: Mr. Pannipa Boonchanian, Calibration Department Manager

Calibration procedure:
The wind direction sensor was calibrated against Standard Rotary Encoder, model: AX40-09T5-DM04-P3-5-10 in an close test section of Eiffel-type wind tunnel with 900 cm² cross test section area. The WI-CI-008 based on IEC 61400-12-1, Wind energy generation 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 standard, and to realization of the international system of units (SI) through the NIMT (National Metrology Institute of Thailand) via Certificate number: TA-0027-24.

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'

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 [2] 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

Jiranatee Associates Co., Ltd.

Certificate Number
CWD-001-68

MEASUREMENT RESULTS [5]

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	$D°_{std}$ Degree (°)	$D°_{uuc}$ Degree (°)	Error Degree (°)	U (k=2) Degree (°)
5.01	45.000	40	-5	0.80
	90.000	86	-4	0.80
	135.000	133	-2	0.80
	180.000	179	-1	0.80
	225.000	227	2	0.80
	270.000	273	3	0.80
	315.000	319	4	0.80
	360.000	359	-1	0.80

Remark:

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

[4] Direction of standard

[3] Direction of Unit Under Calibration

End of Certificate of Calibration

JNAC JIRANATEE ASSOCIATES CO.,LTD.

Jiranatee Associates Co., Ltd.

INNOVATIVE INSTRUMENT CALIBRATION LAB
INNOVATIVE INSTRUMENT CO., LTD. HEAD OFFICE
7/139 MOO 13, SOI SUNTINAKORN 11 TAMBON BANG KAEO,
AMPHOE BANG PHLI SAMUT PRAKAN PROVINCE 10540 THAILAND
TEL: (662)-2116-5860-1 FAX: (662)-2116-7140

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-009
Request No : Req-2025-0090

Unit Under Calibration Details

Measurement item : Acoustic Calibrator
Manufacturer : RION
Model : NC-74
Serial Number : 34178119
ID : BKK_FS0632

Class : 1
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 : 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

REVIEW BY .....
APPROVED BY .....
NEXT CAL DATE..... 16/01/26

Reference Standard	Model	Serial Number	Traceable	Due Calibration
Sound Calibrator	SV 35A	58079	EEI	12 June 2025
THD Multimeter	2015	1047765	NIMT	16 January 2025

Traceability : This certificate providoes 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

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.

Certificate No : 25-ACT-009

Request No : Req-2025-0090

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	93.82	-0.18	-	-	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	0.71	-	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

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.

INNOVATIVE INSTRUMENT CALIBRATION LAB
INNOVATIVE INSTRUMENT CO., LTD. HEAD OFFICE
7/139 MOO 13, SOI SUNTINAKORN 11 TAMBON BANG KAEO,
AMPHOE BANG PHLI SAMUT PRAKAN PROVINCE 10540 THAILAND
TEL: (6630-2116-5860-1 FAX: (6630-2116-7140

Certificate No : 25-ACT-009

Request No : Req-2025-0090

Decision Rule for Statements of Conformity

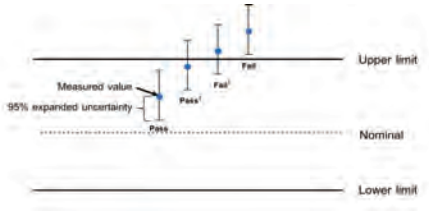
The standard decision rule employed for the statements of conformity to each calibration result will be applied using ILAC-G8:09/2019; Guidelines on the Reporting of Compliance with Specification as following Fig. and statements

Pass = The measurement result plus the expanded uncertainty with a 95% coverage probability were within the limit.

Pass[1] = The measurement result was within the limit. However, a portion of the expanded uncertainty of measurement at 95% exceeds the limit.

Fail[1] = 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 Sirinthorn Road, Bangbumru, Bangplud, Bangkok, 10700 Thailand
Tel. +66 2433 8331 Email : calibration@sithiphorn.com

Cert. No. : ACL25095
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No.: 00858525 / 170383 / 72889
ID No.: BKK_FS0115

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 ..... Nthakorn P.
APPROVED BY .....
NEXT CAL DATE..... 27/01/26 .....

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.

SITHIPORN ASSOCIATES
CALIBRATION LABORATORY

Cert. No. : ACL25095
Job No. : VC68AC0063
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. : ACL25095
Job No. : VC68AC0063
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. : ACL25095
Job No. : VC68AC0063
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)
15.1

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	18.5
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	0.4	0.4	0.4	± 1.5
1000	0.1	0.1	0.1	± 1.0
8000	-1.0	-1.0	-1.0	±5.0

Cert. No. : ACL25095
Job No. : VC68AC0063
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. : ACL25095
Job No. : VC68AC0063
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	53.9	-0.1	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 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	27.0	0.0	± 1.1
26.0	26.0	0.0	± 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	28.9	-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. : ACL25095
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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	133.3	-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		
89.5	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 lavel of confidence of approximately 95 %

End of Calibration Certificate

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TEL: 0608-2110-5869-1 FAX: 0600-2110-7140

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-SLM-149
Request No : Req-2025-0774

Unit Under Calibration Details

Measurement item : Sound Level Meter
Manufacturer : RION
Model : NL-42
Serial Number : 00296514
ID : BKK_FS0971
Resolution : 0.1 dB

Microphone Class : 2
Microphone Model : UC-52
Microphone S/N : 179116
Preamplifier Model : NH-24
Preamplifier S/N : 87523
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 : 28 March 2025
Calibrated Date : 28 April 2025
Calibration 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

REVIEW BY .....
APPROVED BY .....
NEXT CAL DATE..... 28/04/26

Reference Standard

Instrument	Brand	Model	SN.	Due calibration	Traceability
Standard Microphone	Bruel&Kjaer	4192	2294985	25 June 2025	NIMT
Audio Generator	Svantek	Svan401	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 : Mr. Noppadon Luangart, Service Calibration Engineer

Approved By : Mr. Pacit Mathaveri, Calibration Engineer Supervisor

Issue Date : 28 April 2025

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Certificate No : 25-SLM-149
Request No : Req-2025-0774

1. Indication at the calibration check frequency

UUC Setting	Nominal	Before Adjust		After Adjust		UNCERTAINTY
FAST / A / 30-130	Level	UUC	ERR	UUC	ERR	
Calibrator Setting	(dB)	(dB)	(dB)	(dB)	(dB)	(± dB)
1000 Hz 94 dB	93.77	93.6	-0.17	93.8	0.03	0.20

Note : Absolute sensitivity was established by the use of Sound Calibrator Brand Svantek, Model SV35A, SN. 59079

2. Self-generated noise, Microphone installed

UUC Setting	Measured	UNCERTAINTY
FAST / 30-130		
UUC Weighting	(dB)	(± dB)
A	14.9	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	11.4	0.10
C	16.0	0.10
Z	19.5	0.10

4. Acoustic signal test of frequency weightings (Without Windscreen)

UUC Setting	Deviation from various Frequency Weighting Respone curve			UNCERTAINTY
FAST / 30-130	A	C	Z	
STD Setting	(dB)	(dB)	(dB)	(± dB)
125 Hz	0.3	0.5	0.5	0.60
1000 Hz	0.0	0.0	0.0	0.60
4000 Hz	-0.9	-0.9	-0.9	0.60
8000 Hz	-2.5	-2.4	-2.4	0.70

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Certificate No : 25-SLM-149
Request No : Req-2025-0774

5. Electrical signal test of frequency weightings, Weighting network respone with relative to 1 kHz

UUC Setting	Deviation from various Frequency Weighting Respone curve			UNCERTAINTY
FAST / 30-130				
STD Setting	A (dB)	C (dB)	Z (dB)	(± dB)
63 Hz	-0.3	-0.1	0.0	0.20
125 Hz	-0.1	0.0	0.0	
250 Hz	-0.1	0.0	0.0	
500 Hz	0.0	0.0	0.0	
1000 Hz	0.0	0.0	0.0	
2000 Hz	0.0	0.0	0.0	
4000 Hz	0.0	0.0	0.0	
8000 Hz	0.1	0.1	0.0	
16000 Hz	-1.3	-1.4	0.0	

6. Frequency and time weightings at 1kHz

UUC Setting	STD	Measured		UNCERTAINTY
FAST / 30-130	REF	UUC	ERR	
UUC Weighting	(dB)	(dB)	(dB)	(± dB)
A	114.00	114.0	0.0	0.20
C	114.00	114.0	0.0	
Z	114.00	114.0	0.0	

UUC Setting	STD	Measured		UNCERTAINTY
30-130 / A	REF	UUC	ERR	
UUC Time Respone	(dB)	(dB)	(dB)	(± dB)
Fast	114.00	114.0	0.0	0.20
Slow	114.00	114.0	0.0	
Leq	114.00	114.0	0.0	

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Request No : Req-2025-0774

7. Long Term Stability

UUC Setting	Measured	UNCERTAINTY
FAST / A / 30-130	UUC	
STD Setting	(dB)	(± dB)
Initial	114.0	[redacted]
Final	114.0	
Deviated	0.0	0.10

8. Level linearity on the reference level range

UUC Setting	Anticipated	Deviation		UNCERTAINTY
FAST / A / 30-130	REF	UUC	ERR	
STD dB	(dB)	(dB)	(dB)	(± dB)
138.00	138	137.9	-0.1	0.30
134.00	134	133.9	-0.1	
129.00	129	128.9	-0.1	
124.00	124	123.9	-0.1	
119.00	119	119.0	0.0	
114.00	114	114.0	0.0	
109.00	109	109.0	0.0	
104.00	104	104.0	0.0	
99.00	99	99.0	0.0	
94.00	94	94.0	0.0	
89.00	89	89.0	0.0	
84.00	84	84.0	0.0	
79.00	79	79.0	0.0	
74.00	74	74.0	0.0	
69.00	69	69.0	0.0	
64.00	64	64.0	0.0	
59.00	59	59.0	0.0	
54.00	54	54.0	0.0	
49.00	49	49.0	0.0	
44.00	44	44.0	0.0	
39.00	39	39.0	0.0	
34.00	34	34.0	0.0	
29.00	29	28.9	-0.1	
24.00	24	23.9	-0.1	

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FM-706SLM-01 Rev.08 (Latest date) 17/2/25

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Certificate No : 25-SLM-149
Request No : Req-2025-0774

9. Level linearity including the level range control

UUC Setting	STD	Measured		UNCERTAINTY
FAST / A	REF	UUC	ERR	
UUC Range	(dB)	(dB)	(dB)	(± dB)
30-130	29.60	29.7	0.1	0.30
	114	114.0	0.0	

10. Tone burst response

UUC Setting	STD	Anticipated	Measured		UNCERTAINTY
A / 30-130	Toneburst	Ref	UUC	ERR	
UUC Time Respone	(ms)	(dB)	(dB)	(dB)	(± dB)
Fast	200	126.0	126.0	0.0	0.20
	2	109.0	109.0	0.0	
	0.25	100.0	99.9	-0.1	
Slow	200	119.6	119.6	0.0	
	2	100.0	100.0	0.0	
SEL	200	120.0	120.1	+0.1	
	2	100.0	100.0	0.0	
	0.25	91.0	90.9	-0.1	

11. Peak C Sound level

UUC Setting	Anticipated	Measured		UNCERTAINTY
FAST / C / 55-141	REF	UUC	ERR	
STD Setting	(dB)	(dB)	(dB)	(± dB)
Complete cycle	136.4	135.6	-0.80	0.20
Positive half cycle	135.4	135.2	-0.20	
Negative half cycle	135.4	135.2	-0.20	

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FM-706SLM-01 Rev.08 (Latest date) 17/2/25

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Certificate No : 25-SLM-149
Request No : Req-2025-0774

12. Overload indication

UUC Setting	Measured	UNCERTAINTY
FAST / A / 30-130	UUC	
STD Setting	(dB)	(± dB)
Positive one-half cycle	139.5	[redacted]
Negative one-half cycle	139.4	
Deviated	0.1	0.20

13. High Level Stability

UUC Setting	Measured	UNCERTAINTY
FAST / A / 30-130	UUC	
STD Setting	(dB)	(± dB)
Initial	129.0	[redacted]
Final	129.0	
Deviated	0.0	0.10

End of Certificate

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-706SLM-01 Rev.08 (Latest date) 17/2/25

SITHIPORN ASSOCIATES CO., LTD.
CALIBRATION LABORATORY

451-451/1 Sirinthorn Road, Bangbumru, Bangplud, Bangkok, 10700 Thailand
Tel. +66 2433 8331 Email : calibration@sithiporn.com

Cert. No. : ACL25010
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No.: 00572609 / 170133 / 72947
ID No.: BKK_FS0924

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) %

REVIEW BY .....
APPROVED BY .....
NEXT CAL DATE 09/01/26

Received Date : 19 DECEMBER 2024
Calibration Date : 09 - 10 JANUARY 2025
Date of Issue : 13 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. : ACL25010
Job No. : VC68AC0052
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. : ACL25010
Job No. : VC68AC0052
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. : ACL25010
Job No. : VC68AC0052
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	11.6
C - weight	17.5
Flat	23.4

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	0.2	0.2	0.2	± 1.5
1000	0.1	0.1	0.1	± 1.0
8000	0.7	0.8	0.8	±5.0

Cert. No. : ACL25010
Job No. : VC68AC0052
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

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Cert. No. : ACL25010
Job No. : VC68AC0052
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	30.1	0.1	± 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	25.1	0.1	± 1.1

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Job No. : VC68AC0052
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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	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
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

SITHIPORN associates
SITHIPORN ASSOCIATES
CALIBRATION LABORATORY

Cert. No. : ACL25010
Job No. : VC68AC0052
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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	135.2	-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 lavel of confidence of approximately 95 %

End of Calibration Certificate

T. Petch

CONSOLE CONTROL UNIT CALIBRATION TEST REPORT

Calibration of Date : 30 Nov 24
Next Cal. Date : 30 May 25

Barometric Pressure (mmHg) : 756.5
Relative Humidity (%) : 48.0
Temperature (°C) : 32.0

Reference Dry Gas Meter Data

Reference Dry Gas Meter ID : BKK_FS0629
Serial No. : 1607009
Correction Factor (Y) : 1.0000
Next Calibration Date : 10 Jun 25

Console Control Meter Data

Calibration No. : C-301124-BKK_FS0448
Dry Gas Meter ID : BKK_FS0448
Serial No. : 1901983
Model No. : XC-572-V

ΔH (mm-H_2O)	Θ Minutes	Reference Dry Gas Meter Calibration Vr (Litres) Final	Vr (Litres) Initial	Vr (Litres) Total	Tr (°C)	Console Control : Drygas Meter Vm (Litres) Final	Vm (Litres) Initial	Vm (Litres) Total	Ti (°C)	To (°C)	Avg.Tm (°C)	Dry Gas Meter Correction Factor (Y)	Orifice Calibration Factor ΔH@
15	12.41	149.96	0.00	149.96	31.0	427188.0	427032.0	156.00	31.0	31.0	31.0	0.9599	47.5143
25	9.56	150.06	0.00	150.06	31.0	427353.0	427196.0	157.00	31.0	31.0	31.0	0.9535	46.9317
50	6.89	150.00	0.00	150.00	31.0	427528.0	427372.0	156.00	31.0	31.0	31.0	0.9569	48.7939
80	5.21	150.00	0.00	150.00	31.0	427697.0	427541.0	156.00	31.0	31.0	31.0	0.9541	44.6399
120	4.25	150.01	0.00	150.01	31.0	427874.2	427718.0	156.20	31.0	31.0	31.0	0.9493	44.5511
											Avg.	0.9547	46.4862

Y : Ratio of reading of reference to dry gas meter ; tolerance for individual values ± 0.02 from average .

ΔH@ : Orifice 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 & 7

Calibrated by: (Mr.Khanetson khamphet) Field Scientist(3)

Approved by: Mr.Samart Roo-ngan Field Specialist(1)

FORM NO.: F 06-024 REVISION NO.: ISSUE DATE: 1 Jun 24

DIGITAL TEMPERATURE CALIBRATION DATA SHEET

Calibration Date :	30 Nov 24	Ambient Temperature (°C)	32
Calibration sheet No. :	C-301124-BKK_FS0448	Relative Humidity (%) :	48
Digital Temperature ID :	BKK_FS0485	Reference Temperature ID	BKK_FS1144
Serial No. :	1901983	Serial No. :	201090006013
Model :	XC-572-V	Model :	Digicon-CC-VT-MS
		Next Calibrate :	28 Nov 25

Location	Reference Temperature °C	Digital Temperature °C	Error °C	MPE	Pass / Fail
Stack	0	2	2	±3	Pass
	25	23	-2	±3	Pass
	50	48	-2	±3	Pass
	100	98	-2	±3	Pass
	150	147	-3	±3	Pass
	200	197	-3	±3	Pass
	250	247	-3	±3	Pass
	300	297	-3	±3	Pass
	500	497	-3	±3	Pass
Probe	100	99	-1	±3	Pass
	120	119	-1	±3	Pass
	140	139	-1	±3	Pass
Oven	100	100	0	±3	Pass
	120	119	-1	±3	Pass
	140	139	-1	±3	Pass
Filter	100	98	-2	±3	Pass
	120	118	-2	±3	Pass
	140	139	-1	±3	Pass
Exit	0	2	2	±3	Pass
	10	12	2	±3	Pass
	20	21	1	±3	Pass
Meter	0	0	0	±3	Pass
	25	25	0	±3	Pass
	50	50	0	±3	Pass
AUX	0	2	2	±3	Pass
	25	23	-2	±3	Pass
	50	48	-2	±3	Pass

MPE : (Maximum permissible error of measurement) ค่าความผิดพลาดสูงสุดของการวัดที่ยอมได้

Calibrated by : (Mr.Khanetson khamphet) Field Scientist (3)

Approved by : Mr.Samart Roo-ngan Specialist (1)

FORM NO.: F 06-027 REVISION NO.: 2 ISSUE DATE: 16/2/23

PROBE NOZZLE DIAMETER CALIBRATION DATA SHEET

Calibration Date :	30 Nov 24	Nozzle Set ID. :	BKK_FS0454
Calibration Sheet No. :	C-301124-BKK_FS0454	Vernier Caliper ID.:	RYG_FS0539

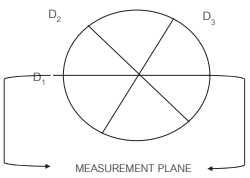
Nozzle ID #	Nozzle Diameter (cm.) D_1	D_2	D_3	Hi - Lo ΔD	$(D_1 + D_2 + D_3) / 3$ D_{avg}
1	0.315	0.315	0.315	0.000	0.315
2	0.475	0.475	0.475	0.000	0.475
3	0.530	0.530	0.530	0.000	0.530
4	0.635	0.635	0.635	0.000	0.635
5	0.790	0.790	0.790	0.000	0.790
6	0.950	0.950	0.950	0.000	0.950
7	1.110	1.110	1.110	0.000	1.110
8	1.270	1.270	1.270	0.000	1.270
9	1.600	1.600	1.600	0.000	1.600

Where :

D_1, D_2, D_3 = 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} = $(D_1 + D_2 + D_3) / 3$



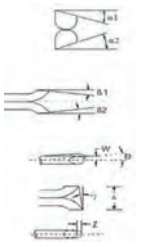
Calibrated by : S.Thong-on (Mr. Suwicha Thong-On) Field Scientist (2)

Approved by : (Mr.Samart Roo-ngan) Field Specialist (1)

FORM NO.: F 06-026 REVISION NO.: - ISSUE DATE: 9/1/03

Type S Pitot Tube Calibration

Date Calibration	30-Nov-24	**Due Date**	1-Jun-25
Pitot ID	BKK_FS0552	**Inclinometer ID**	BKK_FS1131
Pitot SN	-	**Vernier ID**	BKK_FS1405



Parameter	Value	Allowable Range	Check
α1	2.2	-10° < α1 < +10°	OK
α2	3	-10° < α2 < +10°	OK
β1	-1.2	-5° < β1 < +5°	OK
β2	2.3	-5° < β2 < +5°	OK
γ	1.4	-	-
θ	1.2	-	-
Z = A tan γ	0.022	Z ≤ 0.125"	OK
W = A tan θ	0.018	W ≤ 0.031"	OK
Dt	0.375	0.188" to 0.375"	OK
A/2Dt	1.173	1.05 ≤ PA/Dt ≤ 1.5	OK
A	0.88	2.1Dt ≤ A ≤ 3Dt	OK

Certify that pitot tube/porbe meets or exceeds all specifications, crieria 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

SARTORIUS

Accredited by

NSC-TISI-TIS 17025
Calibration 0426

Calibration certificate

Calibration Certificate No. 24BCI0440

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	SECURA224-1S	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.	38304165 | BKK_EN0309	This certificate relate and apply this equipment only.
Customer	ALS Laboratory Group (Thailand)Co., Ltd. 104 Phatthanakarn 40,Phattanakarn Rd.,Khwaeng Phatthanakarn ,Khet Suan Luang,Bangkok 10250	
Order no.	246928	REVIEW BY .....
Number of pages	4	APPROVED BY .....
Date of calibration	05 Nov 2024	NEXT CAL DATE..... 05/11/25

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	Approval of the Calibration Certificate	Person in charge
05 Nov 2024	Mr. Chonchai Inthana	Chonchai Inthana

Calibration object

Single range instrument

Model	SECURA224-1S
Serial Number	38304165
QM Ident. no | Inventory no.	BKK_EN0309 | ---

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	Laboratory 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	05 Nov 2024
Temperature at place of calibration | Temp. diff. $T_{weights}$ - T_{place}	19.6 °C | 0.4 K
Measuring conditions	The installation site is suitable. The device was levelled. Balance was loaded up to Max before test.
Comments	Humidity 68.0 %RH.

Measurement results | Measurement uncertainties

Repeatability

Test load (nominal): 10 g | 100 g		
	10 g	100 g
1	10.0000 g	100.0000 g
2	10.0000 g	99.9999 g
3	10.0001 g	100.0000 g
4	10.0000 g	99.9999 g
5	10.0000 g	100.0000 g
6	9.9999 g	99.9999 g
7	10.0000 g	100.0000 g
8	9.9999 g	100.0000 g
9	10.0000 g	99.9999 g
10	10.0001 g	100.0000 g
	s = 0.00007 g	s = 0.00005 g

Eccentricity

Test load (nominal):	100 g
Center	100.0000 g
Front left	100.0001 g
Back left	100.0000 g
Back right	100.0000 g
Front right	100.0000 g
Maximum deviation from centric loading indication	
$\lvert\Delta E_{ecc}\rvert_{max}$ = 0.0001 g	

Error of indication

Testload L	Indication I	Error E	Expansion factor k	Uncertainty $U(E)$	Uncertainty relative $U_{rel}(E)$
0.0100 g	0.0100 g	0.0000 g	2.00	0.00016 g	1.6 %
0.0500 g	0.0500 g	0.0000 g	2.00	0.00013 g	0.26 %
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	0.027 %
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	0.0067 %
5.0000 g	5.0000 g	0.0000 g	2.00	0.00014 g	0.0027 %
10.0000 g	10.0000 g	0.0000 g	2.00	0.00014 g	0.0014 %
20.0000 g	20.0000 g	0.0000 g	2.00	0.00014 g	0.00071 %
200.0000 g	199.9999 g	-0.0001 g	2.00	0.00028 g	0.00014 %
210.0000 g	210.0000 g	0.0000 g	2.00	0.00031 g	0.00015 %
Maximum error of indication		$\lvert E\rvert_{max}$ = 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 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

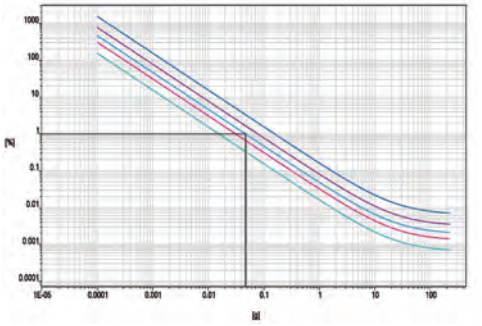
Uncertainty of measurement in use

Device adjusted before measurement	Yes
Temperature deviation considered	1 K (isoCAL active)
Temperature coefficient considered	2 · 10⁻⁶/K
Uncertainty of the weighing result $U_{gl}(W)$	**$U_{gl}(W) = 0.00016\ g + 6.42 \cdot 10^{-6} \cdot R$**

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 $U_{gl}(W)$	Uncertainty relative $U_{gl}(W)_{rel}$
1 %	2.2000 g	0.00017 g	0.0079 %
25 %	55.0000 g	0.00051 g	0.00093 %
50 %	110.0000 g	0.00087 g	0.00079 %
75 %	165.0000 g	0.0012 g	0.00074 %
100 %	220.0000 g	0.0016 g	0.00071 %

Graphic realization of the relative uncertainty of measurement | process accuracy



Displayed example

Process accuracy	1.00 %
Safety factor	3
Minimum sample weight	0.0470 g

Lot No. 2542350-1

ANALYZER CALIBRATION DATA

Client : Gulf JP NK2 Co., Ltd. **Location** : ปล่อง HRSG 11
Date : 20 May 25 **Test Operator** : Worawich T.

O_2 ANALYZER
Model : TELEDYNE API T200H **Serial No.** : 991
Span (%) : 25

	Cylinder Value (%)	Initial Analyzers Calibration Response (%)	Final Analyzers Calibration Response (%)	Difference (Percent of Span)
Zero Gas	0.00	0.00	0.00	0.00
Low-Level Gas	7.98	8.00	7.99	0.04
Span Gas	16.02	16.02	16.01	0.04

NO_x ANALYZER
Model : TELEDYNE API T200H **Serial No.** : 991
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	0.02	0.02
Low-Level Gas	56.16	56.07	55.97	0.10
Span Gas	80.73	80.69	80.49	0.20

SO2 ANALYZER
Model : TELEDYNE API T100H **Serial No.** : 553
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	0.00	0.00
Low-Level Gas	55.55	55.51	55.38	0.13
Span Gas	79.43	79.42	79.10	0.32

CO ANALYZER
Model : TELEDYNE API T300M **Serial No.** : 924
Span (ppm) : 100

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	0.01	0.04	0.03
Low-Level Gas	54.22	54.25	54.17	0.08
Span Gas	79.82	79.80	79.71	0.09

Calibrated by

Worawich T.

(Mr. Worawich Tongpoom)

Environmental Field Scientist (3)

Lot No. 2542350-1

SYSTEM CALIBRATION BIAS AND DRIFT DATA

Client : Gulf JP NK2 Co., Ltd. **Location** : ปล่อง HRSG 11
Date : 20 May 25 **Test Operator** : Worawich T.

O_2 ANALYZER
Cylinder Conc. (%) : 16.02 **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	0.00	0.00	0.01	0.04	0.04
Upscale Gas	16.02	16.06	0.16	16.05	0.12	0.04

NO_x ANALYZER
Cylinder Conc. (ppm) : 80.73 **Span (ppm)** : 100

	NO_x 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	0.06	0.06	0.02
Upscale Gas	80.69	79.99	0.70	79.87	0.82	0.12

SO_2 ANALYZER
Cylinder Conc. (ppm) : 79.43 **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	0.00	0.00	0.01	0.01	0.01
Upscale Gas	79.42	79.33	0.09	79.05	0.37	0.28

CO ANALYZER
Cylinder Conc. (ppm) : 79.82 **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	0.01	0.06	0.05	0.10	0.09	0.04
Upscale Gas	79.80	79.48	0.32	79.51	0.29	0.03

Calibrated by

Worawich T.

(Mr. Worawich Tongpoom)

Environmental Field Scientist (3)

EMISSION TEST RESULT

Client Gulf JP NK2 Co., Ltd. **Run #** 1
Date 20 May 25 **Location** ปล่อง HRSG 11
Start Time 10:30 **Test Operator** Worawich T.
SO_2 Analyzer Model TELEDYNE API T100H **Finish Time** 10:50
NO_x/O_2 Analyzer Model TELEDYNE API T200H **Serial No.** 553
CO/CO_2 Analyzer Model TELEDYNE API T300M **Serial No.** 991
Serial No. 924

Time (min)	O_2 (%)	CO_2 (%)	NOx (ppm)	SO_2 (ppm)	CO (ppm)	Remark
10:30	13.78	3.73	16.63	0.18	0.93	
10:31	13.74	3.73	16.70	0.22	1.01	
10:32	13.74	3.73	16.59	0.22	0.94	
10:33	13.74	3.73	16.52	0.23	1.03	
10:34	13.78	3.73	16.50	0.19	1.04	
10:35	13.78	3.72	16.77	0.19	0.96	
10:36	13.80	3.71	17.05	0.16	1.03	
10:37	13.74	3.72	17.13	0.22	1.00	
10:38	13.76	3.73	16.89	0.21	0.98	
10:39	13.75	3.73	16.75	0.21	1.01	
10:40	13.76	3.73	16.84	0.21	1.07	
10:41	13.74	3.72	16.82	0.23	1.03	
10:42	13.76	3.72	16.73	0.21	1.11	
10:43	13.77	3.72	16.74	0.20	1.02	
10:44	13.77	3.72	16.94	0.20	1.05	
10:45	13.80	3.71	17.16	0.16	1.07	
10:46	13.78	3.71	17.25	0.18	1.03	
10:47	13.76	3.71	17.03	0.20	0.95	
10:48	13.77	3.71	16.77	0.19	1.03	
10:49	13.76	3.71	16.73	0.20	0.94	
10:50	13.78	3.71	16.80	0.18	0.89	
Average	**13.77**	**3.72**	**16.82**	**0.20**	**1.01**	

Worawich T.

(Mr. Worawich Tongpoom)

Environmental Field Scientist (3)

EMISSION TEST RESULT

Client Gulf JP NK2 Co., Ltd. **Run #** 2
Date 20 May 25 **Location** ปล่อง HRSG 11
Start Time 10:51 **Test Operator** Worawich T.
SO_2 Analyzer Model TELEDYNE API T100H **Finish Time** 11:11
NO_x/O_2 Analyzer Model TELEDYNE API T200H **Serial No.** 553
CO/CO_2 Analyzer Model TELEDYNE API T300M **Serial No.** 991
Serial No. 924

Time (min)	O_2 (%)	CO_2 (%)	NOx (ppm)	SO_2 (ppm)	CO (ppm)	Remark
10:51	13.79	3.73	16.76	0.18	1.01	
10:52	13.83	3.71	16.78	0.13	0.99	
10:53	13.80	3.70	16.95	0.17	0.94	
10:54	13.74	3.71	16.93	0.23	0.92	
10:55	13.73	3.74	16.78	0.23	0.87	
10:56	13.76	3.74	16.66	0.21	0.84	
10:57	13.73	3.74	16.66	0.23	1.00	
10:58	13.75	3.73	16.54	0.21	1.02	
10:59	13.76	3.74	16.50	0.21	0.97	
11:00	13.77	3.73	16.56	0.19	0.98	
11:01	13.79	3.73	16.64	0.18	1.00	
11:02	13.79	3.72	16.91	0.18	0.95	
11:03	13.81	3.72	17.30	0.16	0.95	
11:04	13.79	3.71	17.34	0.17	0.95	
11:05	13.74	3.72	17.12	0.23	0.96	
11:06	13.74	3.73	16.85	0.23	0.95	
11:07	13.77	3.72	16.74	0.19	0.96	
11:08	13.80	3.72	16.87	0.16	0.92	
11:09	13.82	3.71	17.08	0.14	0.84	
11:10	13.82	3.71	17.26	0.15	0.95	
11:11	13.79	3.71	17.20	0.18	0.82	
Average	**13.78**	**3.72**	**16.88**	**0.19**	**0.94**	

Worawich T.

(Mr. Worawich Tongpoom)

Environmental Field Scientist (3)

EMISSION TEST RESULT

Client	Gulf JP NK2 Co., Ltd.	Run #	3
Date	20 May 25	Location	ปล่อง HRSG 11
Start Time	11:12	Test Operator	Worawich T.
SO_2 Analyzer Model	TELEDYNE API T100H	Finish Time	11:32
NO_x/O_2 Analyzer Model	TELEDYNE API T200H	Serial No.	553
CO/CO_2 Analyzer Model	TELEDYNE API T300M	Serial No.	991
		Serial No.	924

Time (min)	O_2 (%)	CO_2 (%)	NOx (ppm)	SO_2 (ppm)	CO (ppm)	Remark
11:12	13.81	3.71	17.05	0.15	0.92	
11:13	13.80	3.71	17.04	0.17	0.86	
11:14	13.79	3.71	17.03	0.17	0.96	
11:15	13.81	3.71	16.95	0.15	0.90	
11:16	13.79	3.71	16.84	0.17	0.92	
11:17	13.82	3.71	16.76	0.14	0.91	
11:18	13.81	3.72	16.78	0.15	0.88	
11:19	13.78	3.73	16.79	0.18	0.91	
11:20	13.78	3.72	16.82	0.18	0.86	
11:21	13.76	3.72	16.85	0.21	0.76	
11:22	13.81	3.71	16.86	0.15	0.73	
11:23	13.79	3.71	16.86	0.18	0.78	
11:24	13.78	3.72	16.86	0.18	0.89	
11:25	13.80	3.72	16.85	0.16	0.74	
11:26	13.80	3.71	16.75	0.16	0.88	
11:27	13.81	3.71	16.82	0.15	0.89	
11:28	13.78	3.70	16.81	0.19	0.83	
11:29	13.78	3.71	16.73	0.18	0.87	
11:30	13.78	3.74	16.77	0.19	0.86	
11:31	13.78	3.72	16.89	0.18	0.92	
11:32	13.77	3.74	17.01	0.19	0.83	
Average	**13.79**	**3.72**	**16.86**	**0.17**	**0.86**	

Nbranich T.

(Mr. Worawich Tongpoom)

Environmental Field Scientist (3)

Lot No. 2542351-1

ANALYZER CALIBRATION DATA

Client : Gulf JP NK2 Co., Ltd. Location : ปล่อง HRSG 12

Date : 21 May 25 Test Operator : Worawich T.

O_2 ANALYZER

Model : TELEDYNE API T200H Serial No. : 991

Span (%) : 25

	Cylinder Value (%)	Initial Analyzers Calibration Response (%)	Final Analyzers Calibration Response (%)	Difference (Percent of Span)
Zero Gas	0.00	0.00	0.00	0.00
Low-Level Gas	7.98	7.98	8.01	0.12
Span Gas	16.02	16.02	16.03	0.04

NO_x ANALYZER

Model : TELEDYNE API T200H Serial No. : 991

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	56.16	56.12	56.08	0.04
Span Gas	80.73	80.74	80.66	0.08

SO2 ANALYZER

Model : TELEDYNE API T100H Serial No. : 553

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	0.00	0.00
Low-Level Gas	55.55	55.49	55.24	0.25
Span Gas	79.43	79.40	79.17	0.23

CO ANALYZER

Model : TELEDYNE API T300M Serial No. : 924

Span (ppm) : 100

	Cylinder Value (ppm)	Initial Analyzers Calibration Response (ppm)	Final Analyzers Calibration Response (ppm)	Difference (Percent of Span)
Zero Gas	0.00	0.01	0.06	0.05
Low-Level Gas	54.22	54.11	54.15	0.04
Span Gas	79.82	79.81	79.88	0.07

Calibrated by

Nbranich T.

(Mr. Worawich Tongpoom)

Environmental Field Scientist (3)

Lot No. 2542351-1

SYSTEM CALIBRATION BIAS AND DRIFT DATA

Client : Gulf JP NK2 Co., Ltd. Location : ปล่อง HRSG 12

Date : 21 May 25 Test Operator : Worawich T.

O_2 ANALYZER

Cylinder Conc. (%) : 16.02 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	0.01	0.04	0.01	0.04	0.00
Upscale Gas	16.02	16.05	0.12	16.07	0.20	0.08

NO_x ANALYZER

Cylinder Conc. (ppm) : 80.73 Span (ppm) : 100

	NO_x 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	0.02	0.02	0.05	0.05	0.03
Upscale Gas	80.74	79.68	1.06	79.55	1.19	0.13

CO ANALYZER

Cylinder Conc. (ppm) : 79.82 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	0.01	0.08	0.07	0.11	0.10	0.03
Upscale Gas	79.81	79.48	0.33	79.51	0.30	0.03

Calibrated by

Nbranich T.

(Mr. Worawich Tongpoom)

Environmental Field Scientist (3)

EMISSION TEST RESULT

Client	Gulf JP NK2 Co., Ltd.	Run #	1
Date	21 May 25	Location	ปล่อง HRSG 12
Start Time	10:30	Test Operator	Worawich T.
SO_2 Analyzer Model	TELEDYNE API T100H	Finish Time	10:50
NO_x/O_2 Analyzer Model	TELEDYNE API T200H	Serial No.	553
CO/CO_2 Analyzer Model	TELEDYNE API T300M	Serial No.	991
		Serial No.	924

Time (min)	O_2 (%)	CO_2 (%)	NOx (ppm)	SO_2 (ppm)	CO (ppm)	Remark
10:30	13.63	3.79	20.77	0.18	1.05	
10:31	13.63	3.81	20.78	0.16	1.03	
10:32	13.63	3.81	20.74	0.20	1.07	
10:33	13.65	3.81	20.67	0.19	1.05	
10:34	13.61	3.80	20.68	0.13	1.00	
10:35	13.61	3.82	20.72	0.17	1.04	
10:36	13.59	3.83	20.81	0.15	1.02	
10:37	13.59	3.84	20.87	0.18	1.05	
10:38	13.60	3.84	20.96	0.12	0.99	
10:39	13.60	3.83	20.98	0.10	0.97	
10:40	13.59	3.83	20.95	0.14	1.01	
10:41	13.59	3.83	20.90	0.15	1.02	
10:42	13.59	3.83	20.84	0.17	1.04	
10:43	13.59	3.84	20.75	0.14	1.01	
10:44	13.56	3.84	20.68	0.19	1.05	
10:45	13.58	3.84	20.62	0.23	1.10	
10:46	13.58	3.83	20.51	0.21	1.07	
10:47	13.59	3.83	20.41	0.18	1.05	
10:48	13.58	3.84	20.35	0.20	1.07	
10:49	13.57	3.84	20.34	0.16	1.03	
10:50	13.59	3.84	20.38	0.10	0.98	
Average	**13.60**	**3.83**	**20.70**	**0.16**	**1.03**	

Nbranich T.

(Mr. Worawich Tongpoom)

Environmental Field Scientist (3)

EMISSION TEST RESULT

Client	Gulf JP NK2 Co., Ltd.	Run #	2
Date	21 May 25	Location	ปล่อง HRSG 12
Start Time	10:51	Test Operator	Worawich T.
SO_2 Analyzer Model	TELEDYNE API T100H	Finish Time	11:11
NO_x/O_2 Analyzer Model	TELEDYNE API T200H	Serial No.	553
CO/CO_2 Analyzer Model	TELEDYNE API T300M	Serial No.	991
		Serial No.	924

Time (min)	O_2 (%)	CO_2 (%)	NOx (ppm)	SO_2 (ppm)	CO (ppm)	Remark
10:51	13.56	3.84	20.35	0.17	1.04	
10:52	13.58	3.83	20.29	0.16	1.03	
10:53	13.56	3.83	20.23	0.16	1.03	
10:54	13.58	3.84	20.13	0.12	0.99	
10:55	13.58	3.84	20.12	0.09	0.96	
10:56	13.60	3.85	20.15	0.09	0.97	
10:57	13.57	3.84	20.22	0.15	1.02	
10:58	13.59	3.84	20.27	0.05	0.92	
10:59	13.58	3.85	20.30	0.17	0.94	
11:00	13.57	3.84	20.39	0.18	0.95	
11:01	13.58	3.84	20.59	0.19	0.96	
11:02	13.57	3.84	20.82	0.18	0.95	
11:03	13.56	3.85	20.89	0.14	0.91	
11:04	13.57	3.85	20.94	0.18	0.95	
11:05	13.57	3.85	20.91	0.20	0.97	
11:06	13.55	3.86	20.86	0.20	0.97	
11:07	13.54	3.85	20.84	0.19	0.96	
11:08	13.54	3.85	20.83	0.19	0.96	
11:09	13.57	3.84	20.82	0.18	0.95	
11:10	13.57	3.84	20.82	0.18	0.95	
11:11	13.57	3.85	20.86	0.16	0.93	
Average	**13.57**	**3.84**	**20.55**	**0.16**	**0.97**	

Worawich T.

(Mr. Worawich Tongpoom)

Environmental Field Scientist (3)

EMISSION TEST RESULT

Client	Gulf JP NK2 Co., Ltd.	Run #	3
Date	21 May 25	Location	ปล่อง HRSG 12
Start Time	11:12	Test Operator	Worawich T.
SO_2 Analyzer Model	TELEDYNE API T100H	Finish Time	11:32
NO_x/O_2 Analyzer Model	TELEDYNE API T200H	Serial No.	553
CO/CO_2 Analyzer Model	TELEDYNE API T300M	Serial No.	991
		Serial No.	924

Time (min)	O_2 (%)	CO_2 (%)	NOx (ppm)	SO_2 (ppm)	CO (ppm)	Remark
11:12	13.55	3.85	20.92	0.18	0.95	
11:13	13.57	3.85	20.93	0.15	0.92	
11:14	13.50	3.86	20.96	0.18	0.95	
11:15	13.52	3.87	20.55	0.21	0.98	
11:16	13.52	3.87	19.68	0.19	0.96	
11:17	13.54	3.86	18.66	0.15	0.92	
11:18	13.55	3.86	17.95	0.13	0.90	
11:19	13.56	3.86	17.39	0.10	0.87	
11:20	13.56	3.85	16.98	0.10	0.87	
11:21	13.56	3.85	16.82	0.11	0.89	
11:22	13.55	3.86	16.75	0.08	0.85	
11:23	13.55	3.86	16.73	0.11	0.89	
11:24	13.54	3.86	16.75	0.13	0.91	
11:25	13.54	3.86	16.82	0.09	0.87	
11:26	13.54	3.85	16.83	0.13	0.91	
11:27	13.55	3.85	16.89	0.13	0.90	
11:28	13.54	3.87	16.99	0.13	0.90	
11:29	13.53	3.87	17.10	0.18	0.95	
11:30	13.54	3.86	17.17	0.16	0.93	
11:31	13.53	3.86	17.21	0.16	0.93	
11:32	13.53	3.87	17.22	0.11	0.88	
Average	**13.54**	**3.86**	**17.97**	**0.14**	**0.91**	

Worawich T.

(Mr. Worawich Tongpoom)

Environmental Field Scientist (3)

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA LLC
6141 Easton Road
Plumsteadville, PA 18949
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA PROTOCOL STANDARD

Customer:	AIR LIQUIDE (THAILAND) LTD		
Part Number:	E04NI99E3HA0002	Reference Number:	160-402340013-1
Cylinder Number:	GN0027199	Cylinder Volume:	247.2 CF
Laboratory:	124 - Plumsteadville - PA	Cylinder Pressure:	2215 PSIG
PGVP Number:	A12022	Valve Outlet:	660
Gas Code:	CO,NO,NOX,SO2,BALN	Certification Date:	Feb 11, 2022

Expiration Date: Feb 11, 2030

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a 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	80.00 PPM	80.73 PPM	G1	+/- 1.0% NIST Traceable	02/04/2022, 02/11/2
CARBON MONOXIDE	80.00 PPM	79.52 PPM	G1	+/- 0.5% NIST Traceable	02/04/2022
NITRIC OXIDE	80.00 PPM	80.73 PPM	G1	+/- 1.0% NIST Traceable	02/04/2022, 02/11/2
SULFUR DIOXIDE	80.00 PPM	79.43 PPM	G1	+/- 0.8% NIST Traceable	02/04/2022, 02/11/2
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	09010212	KAL004777	98.48 PPM CARBON MONOXIDE/NITROGEN	+/- 0.5%	Oct 16, 2024
NTRM	200610-15	CC733106	98.61 PPM NITRIC OXIDE/NITROGEN	+/- 0.9%	Oct 06, 2026
NTRM	200610-04	CC765044	98.61 PPM NITRIC OXIDE/NITROGEN	+/- 0.9%	Oct 06, 2026
GMIS	1242068699139	CC323707	4.097 PPM NITROGEN DIOXIDE/NITROGEN	+/- 2.0%	Sep 03, 2024
NTRM	11D10415	KAL004813	99.5 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.8%	Jul 28, 2023

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet iS50 FTIR AUP2010245 CO	FTIR	Feb 03, 2022
Nicolet iS50 FTIR AUP2010245 NO	FTIR	Feb 10, 2022
Nicolet iS50 FTIR AUP2010245 NO2	FTIR	Jan 27, 2022
Nicolet iS50 FTIR AUP2010245 SO2	FTIR	Jan 20, 2022

Triad Data Available Upon Request

NOTES: Gross Weight: 46.6 Kg
Net Weight: 8.1 Kg

Airgas Specialty Gases
Airgas USA, LLC
6141 Easton Road
Bldg 2
Plumsteadville, PA 18949
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E04NI99E3HA0066	Reference Number:	160-402138464-1
Cylinder Number:	ND11215	Cylinder Volume:	247.2 CF
Laboratory:	124 - Plumsteadville - PA	Cylinder Pressure:	2215 PSIG
PGVP Number:	A12021	Valve Outlet:	660
Gas Code:	CO,NO,NOX,SO2,BALN	Certification Date:	Jul 15, 2021

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 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a 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	56.16 PPM	G1	+/- 1.4% NIST Traceable	07/08/2021, 07/15/2021
CARBON MONOXIDE	55.00 PPM	54.22 PPM	G1	+/- 0.5% NIST Traceable	07/08/2021
NITRIC OXIDE	55.00 PPM	56.16 PPM	G1	+/- 1.0% NIST Traceable	07/08/2021, 07/15/2021
SULFUR DIOXIDE	55.00 PPM	55.55 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	KAL004936	97.31 PPM CARBON MONOXIDE/NITROGEN	+/- 0.4%	Oct 04, 2022
PRM	12386	D685925	9.91 PPM AIR/NITROGEN DIOXIDE	2.0%	Feb 20, 2020
NTRM	200610-50	CC733426	98.61 PPM NITRIC OXIDE/NITROGEN	+/- 0.9%	Oct 06, 2026
GMIS	1242068663	CC323707	4.028 PPM NITROGEN DIOXIDE/NITROGEN	2.1%	Aug 15, 2021
NTRM	16010224	KAL003808	97.69 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.8%	Dec 23, 2021

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

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
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 09, 2021

Triad Data Available Upon Request

NOTES:
Gross Weight: 47.9 Kg
Net Weight: 7.6 Kg

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA LLC
6141 Easton Road
Plumsteadville, PA 18949
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA PROTOCOL STANDARD

Customer:	AIR LIQUIDE (THAILAND) LTD		
Part Number:	E02NI92E3HA0000	Reference Number:	160-402340009-1
Cylinder Number:	GN0027038	Cylinder Volume:	248.4 CF
Laboratory:	124 - Plumsteadville - PA	Cylinder Pressure:	2214 PSIG
PGVP Number:	A12022	Valve Outlet:	590
Gas Code:	O2,BALN	Certification Date:	Feb 10, 2022

Expiration Date: Feb 10, 2030

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a 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
OXYGEN	8.000 %	7.979 %	G1	+/- 0.5% NIST Traceable	02/10/2022
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	10010635	K022178	9.887 % OXYGEN/NITROGEN	+/- 0.3%	Apr 19, 2022

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
SIEMENS OXYMAT 6 - N1-W5-851 - O2	PARAMAGNETIC	Jan 27, 2022

Triad Data Available Upon Request

NOTES: Gross Weight: 48.3 Kg
Net Weight: 8.1 Kg

Approved for Release

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA LLC
6141 Easton Road
Plumsteadville, PA 18949
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA PROTOCOL STANDARD

Customer:	AIR LIQUIDE (THAILAND) LTD		
Part Number:	E02NI84E3HA0001	Reference Number:	160-402340010-1
Cylinder Number:	GN0027207	Cylinder Volume:	249.8 CF
Laboratory:	124 - Plumsteadville - PA	Cylinder Pressure:	2214 PSIG
PGVP Number:	A12022	Valve Outlet:	590
Gas Code:	O2,BALN	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 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a 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
OXYGEN	16.00 %	16.02 %	G1	+/- 0.4% NIST Traceable	02/02/2022
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	09010230	K005228	23.20 % OXYGEN/NITROGEN	+/- 0.4%	Jun 01, 2022

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
SIEMENS OXYMAT 6 - N1-W5-951 - O2	PARAMAGNETIC	Jan 27, 2022

Triad Data Available Upon Request

NOTES: Gross Weight: 48.8 Kg
Net Weight: 8.2 Kg

Approved for Release

HACH
Be Right™

REVIEW BY Chayathorn R.
APPROVED BY Marakorn P.
NEXT CAL. DATE 13/08/25

Test Report

Customers	:	ALS Laboratory Group (Thailand) Co., Ltd.			
Equipment	:	Colorimeter	Manufacturer	:	HACH
Controller Model	:	☐ DR300 ☑ Pocket II	ID No.	:	BKK_LG0018
Controller Serial No.	:	13060E225094	Sensor Serial No.	:	-
Date of test	:	13/08/2024	Period	:	1 Year
Environment temperature	:	25 °C	Humidity	:	60 %RH

Results

Instrument Checked

Item	Characteristic	Before	After	Remark
1	Visual Inspect	☑ Pass ☐ Fail	☑ Pass ☐ Fail	
2	Power Supply (4.5 – 6.0 VDC)	6.0 VDC	6.0 VDC	
3	Display Check	☑ Pass ☐ Fail	☑ Pass ☐ Fail	
4	Keyboard Check	☑ Pass ☐ Fail	☑ Pass ☐ Fail	
5	Function System Program	☑ Pass ☐ Fail	☑ Pass ☐ Fail	

Warning and Error Checked

Item	Event	Before	After
6	Error list	☑ None ☐ Appear_____	☑ None ☐ Appear_____

Check with Standard

Item	Characteristic	Before	After	Remark
	DPD-CHLORINE-LR			
7	Blank (0.00 mg/l)	0.00 mg/l	0.00 mg/l	
8	Standard Cl2 No. 1 (0.19 ± 0.09 mg/l)	0.20 mg/l	0.19 mg/l	
9	Standard Cl2 No. 2 (0.89 ± 0.10 mg/l)	0.89 mg/l	0.89 mg/l	
10	Standard Cl2 No. 3 (1.59 ± 0.14 mg/l)	1.57 mg/l	1.59 mg/l	
	DPD-CHLORINE-HR			
11	Blank (0.0 mg/l)	0.0 mg/l	0.0 mg/l	
12	Standard Cl2 No. 1 (2.2 ± 0.2 mg/l)	2.2 mg/l	2.2 mg/l	
13	Standard Cl2 No. 2 (3.8 ± 0.3 mg/l)	3.8 mg/l	3.8 mg/l	
14	Standard Cl2 No. 3 (6.8 ± 0.6 mg/l)	6.7 mg/l	6.8 mg/l	

บริษัท ฮัค (ประเทศไทย) จำกัด: อาคารดี ห้องเลขที่ ดี 3 11 ชั้นที่3 เลขที่ 735/4 ถนนศรีนครินทร์ แขวงพัฒนาการ เขตสวนหลวง กรุงเทพฯ 10250
Tel: +66 (0) 026-3529 | Fax: +66(0) 026-3572 | Tax ID : 0105552107330 | Email: thmarketing@hach.com | www.th.hach.com

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Summary of checked

- ☑ The instrument can work normally and efficiently. (เครื่องมือวัดสามารถทำงานได้ปกติและมีประสิทธิภาพ)
- ☐ The instrument can work but it's requiring to maintenance. (เครื่องมือวัดสามารถทำงานได้แต่ต้องบำรุงรักษา)
- ☐ The instrument could not work it's requiring to repair. (เครื่องมือวัดไม่สามารถทำงานได้และต้องการซ่อมบำรุง)

Remark:

Standard Equipment Used

Equipment	Equipment I.D.	
Standard Absorbance DPD-CHLORINE-LR	Lot No. A3020	Exp date : Feb-25
Standard Absorbance DPD-CHLORINE-HR	Lot No. A4025	Exp date : Jan-26
Digital multi meter	S/N : 19430676	Due date : Oct-24
Thermo hygrometer	S/N : 34855953	Due date : Oct-24

Test By : WILAILAK S.
(Miss Wilailak Sawangpun)
Service Engineer

Approved by :
(Mr. Suanun Sartyangkool)
Position : Assistant Service Division Manager

บริษัท ฮัค (ประเทศไทย) จำกัด: อาคารดี ห้องเลขที่ ดี 3 11 ชั้นที่3 เลขที่ 735/4 ถนนศรีนครินทร์ แขวงพัฒนาการ เขตสวนหลวง กรุงเทพฯ 10250
Tel: +66 (0) 026-3529 | Fax: +66(0) 026-3572 | Tax ID : 0105552107330 | Email: thmarketing@hach.com | www.th.hach.com

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.: 25CH154
Page.: 1 of 3

Equipment :	pH Meter
Manufacturer :	Mettler Toledo
Model :	Seven2Go S2
Serial No. :	B617388431
ID No. :	BKK_LG0004
Condition As-Received:	Used Item
Received Date :	03 February 2025
Calibration Date :	04 February 2025
Reference :	2502-0064DSC-6
Submitted by :	ALS Laboratory Group (Thailand) Co.,Ltd. 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250 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 :	Warakorn Lerngagtrakul
Approved by :	Approved Signatory

REVIEW BY Chayathon P.
APPROVED BY Warakorn P.
NEXT CAL DATE 04/02/26

( ) Chakrit Waewwanjua
( ) Ponpan Paipim
(✓) Saithip Meangmai

Issue Date : 05 February 2025

The Uncertainties are for a confidence probability of approximately 95%

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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 Throught 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	Coverage factor
	pH	mV	mV	pH	(±mV)	*k*
pH Meter	4.00	177.48	177	4.00	0.58	2.00
S/N.: B617388431	7.00	0.00	0	7.00	0.58	2.00
	10.00	-177.48	-178	10.00	0.58	2.00

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	4.007	4.01	190	0.0071	2.00
S/N.: 4363676	6.999	7.00	14	0.0085	2.00
	10.010	10.01	-162	0.0092	2.00

Function : Temperature Measurement

(*) Without adjustment

This equipment was connected with Temperature Probe;

- Model : InLab®Expert Go-ISM
- Serial No. : 4363676

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	25.002	25.1	0.098	0.13	2.00
45.0	45.003	45.2	0.197	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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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
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TEL.0-2717-3000-29 FAX.0-2719-9484

Certificate of Calibration

Cert.No.: 24CH1295
Page.: 1 of 3

Equipment :	pH Meter
Manufacturer :	Hach
Model :	HQ411d
Serial No. :	200100031163
ID No. :	BKK_EN0342
Condition As-Received:	Used Item
Received Date :	16 October 2024
Calibration Date :	17 October 2024
Reference :	2410-0548DSC-5
Submitted by :	ALS Laboratory Group (Thailand) Co.,Ltd. 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250 Thailand
Ambient Temperature :	(25 ± 2.5) °C
Relative Humidity :	(50 ± 15) %
Calibration Procedure :	In - house method : - CP-CH5 by direct measurement with certified reference material (CRM) - CP-CH8 by comparison with temperature standard
Calibrated by :	Warakorn Lerngagtrakul
Approved by :	Approved Signatory

REVIEW BY Sinda K.
APPROVED BY Sihluk P.
NEXT CAL DATE 17/10/25

( ) Unnopphol Harachai
( ) Ponpan Paipim
(✓) Saithip Meangmai

Issue Date : 21 October 2024

The Uncertainties are for a confidence probability of approximately 95%

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Condition of this calibration result

1. Reference Standard Instrument

Instrument	Serial No.	ID No.	Cert. No.	Due Date
1)Ref. Standard Thermometer	2188080	130RC044	24I1022	16 Sep 2025

- This Certification is traceable to SI Throught 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 4.008	CPA chem	1034203	27 Sep 2026
pH 6.999	Hach Lenge GmbH	C03145	28 Feb 2026
pH 10.010	CPA chem	1034205	27 Sep 2025

3. This certificate is valid only to the item calibrated on date and place of calibration.

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	4.008	4.028	174.6	0.0044	2.00
S/N.: 230473042902	6.999	7.014	1.4	0.0084	2.05
	10.010	10.018	-172.8	0.0066	2.00

Remark - Can not connect the BNC because the plug does not match with the socket.

Calibration Results

Function : Temperature Measurement

(*) Without adjustment

This equipment was connected with Temperature Probe;

- Model : PHC281
- Serial No. : 230473042902

Dimension of probe

- Length : 103 mm.
- Diameter : 12 mm.
- Immersion Depth : 90 mm.

Calibration Point (°C)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty of measurement (± °C)	Coverage factor *k*
25.0	25.002	25.0	-0.002	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 %.

-o0o-

Sartorius (Thailand) Co., Ltd.
129 Rama 9 Road, Huaykwang, Huaykwang, Bangkok 10310
Tel +66 2643 8301-6 , e-mail: service.thailand@sartorius.com

ISO-GUM
NSO-TISI-TIS 17025
CALIBRATION 0428

SARTORIUS

REVIEW BY Jinda K.
APPROVED BY Chaluk P.
NEXT CAL DATE 02/08/25

Certificate of Calibration

Model Number : MSE224S-100-DU
Description : Analytical Balance
Serial Number : 0027405555
ID No. : BKK_EN0003
Manufacturer : Sartorius

Certificate No. : 24BC10270
Issued Date : Monday, August 05, 2024
Reference No. : 240942
Page No. : 1 Of 2

Customer Name : ALS Laboratory Group (Thailand)Co., Ltd.
104 Phatthanakan 40,Phatthanakan Rd., Khwaeng Suan Luang, Khet Suan Luang, Bangkok 10250

Calibrated Place : Lab Room

Calibrated By : Mr.Chanchai Inthana
Calibration Date : Friday, August 02, 2024

Calibration Procedure No. : This calibration was conducted by using in-house calibration procedure number (WI-003) Based on UKAS LAB 14 : 2019

Metrological data :
Capacity : 220 g Readability : 0.0001 g

Ambients Conditions.
Temperature : 23.0 °C ± 5.0 °C
Humidity : 55.0 % RH ± 10.0 % RH
Pressure ± -

Reasons for calibration
☐ New Installation ☐ Service / Repaired ☒ Re-calibration/ Maintenance

Equipment Condition: ☒ Good Operate ☐ Fair

Measurement Method UKAS Publication Ref :Lab 14

The measurement uncertainty stated is the expended uncertainty which is obtained from the standard uncertainty multiplied by the coverage factor (k=2) to provide a level of confidence of approximately 95%. It is determined in accordance with the Guide to Expression of Uncertainty in Measurement (GUM). The calibration certificate documents the traceability to National Standards, which realise the unit of measurement according to the International Standard System of Units (SI). Report of Tolerance came from list of Sartorius Metrological Specifications.

Traceability:

Model Number	Description	Traceability	Certificate No.	Due Date
YCS01-522-00	Sartorius weight set 1mg - 5000g E2,YCS01-522-00	TCS	M23081975	23-Aug-2025
Testo 174 H	Thermo-Hygrometer , Testo 174H	ENTECH	H/T 661303,H661140	12-Nov-2024

This certificate relate and apply this equipment only.
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Mr.chanchai Inthana(Technical Manager)

STAMP

SOP FM 33 03 February 2022

Sartorius (Thailand) Co., Ltd.
129 Rama 9 Road, Huaykwang, Huaykwang, Bangkok 10310
Tel: +66 2643 8301-6 Fax: +66 2643-8307, e-mail: service.thailand@sartorius.com

SARTORIUS

Certificate of Calibration

Model Number : MSE224S-100-DU
Description : Analytical Balance
Serial Number : 0027405555
ID No. : BKK_EN0003
Manufacturer : Sartorius

Certificate No. : 24BC10270
Issued Date : Monday, August 05, 2024
Reference No. : 240942
Page No. : 2 of 2

Calibration Results : Without Adjustment

Repeatability

The repeatability is the ability of a weighing instrument to display nearly identical readouts under constant test conditions when the same load within a measurement series is placed repeatedly on the weighing pan in the same manner. The standard deviation is used to express repeatability quantitatively.

Nominal Value : (Low Load)			
20	g	20.0000	200.0000
		20.0000	199.9999
Tolerance		20.0001	200.0000
0.0001	g	20.0000	200.0000
		20.0000	200.0000
Nominal Value : (High Load)		20.0000	200.0000
200	g	20.0001	200.0001
Tolerance		20.0000	200.0000
0.0001	g	20.0000	199.9999
		20.0000	200.0000
Standard Deviation		0.00004	0.00006

Eccentricity (Off-center loading error)

The off-center loading error is yielded by the difference between the readout of the test, i.e. 1/3 or 1/4 of maximum capacity, placed in the middle of the weighing pan and between each of four additional measurement points (positions defined according to OIML R76).

Nominal value : 100 g
Tolerance 0.0004 g

	Difference
1	-
2	0.0000
3	0.0000
4	0.0000
5	0.0001
6	-

Linearity

The linearity, also called linearity error, Describes the deviation of the characteristic curve of a weighing instrument from the linear slope.

Tolerance 0.0002 g

Nominal Value (g)	Conventional Mass Value (g)	Displayed Value (g)	Deviation (g)	Uncertainty (g)
0.01	0.0100	0.0100	0.0000	0.00015
0.1	0.1000	0.1000	0.0000	0.00015
1	1.0000	1.0000	0.0000	0.00015
2	2.0000	2.0000	0.0000	0.00015
5	5.0000	5.0000	0.0000	0.00015
10	10.0000	10.0000	0.0000	0.00015
20	20.0000	20.0000	0.0000	0.00015
50	50.0000	50.0001	0.0001	0.00016
100	100.0000	100.0001	0.0001	0.00019
200	200.0000	200.0000	0.0000	0.00029

End of Report.

SOP FM 33 03 February 2022

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
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TEL.0-2717-3000-29 FAX.0-2719-9484

ilac-MRA

NSC-TISI-TIS17025 CALIBRATION 0008

Certificate of Calibration

Cert. No.: 24TM1618
Page : 1 of 3

Equipment :	Water Bath
Manufacturer :	Memmert
Model :	WNE29
Serial No. :	L622.0282
ID No. :	BKK_EN0439

REVIEW BY Siriluk P.
APPROVED BY Siriluk P.
NEXT CAL DATE 29/10/25

Submitted by :	ALS Laboratory Group (Thailand) Co.,Ltd. 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250 Thailand
Location :	Organic Preparation Lab
Received Order :	29 October 2024
Calibration Date :	29 October 2024
Ambient Temperature :	(26 ± 10) ℃
Relative Humidity :	(50 ± 30) %
Calibrated by :	Man Pattanapongpaiboon
Approved by :	Kunchit

Approved Signatory

( ) Ponpan Paipim
( ) Suwit Imjai
(✓) Kunchit Promprat

Issue Date : 30 October 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.

Calibration were conducted using in-house calibration procedure CP-OT04 Based on ASTM E715 according to direct measurement method with Data Acquisition which connected with Industrial Platinum Resistance Thermometer (IPRT).

The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

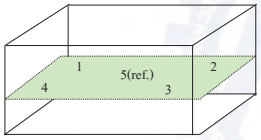
Instrument	Serial No.	Cert. No.	Traceable	Due Date
1) Data Acquisition	MY57013711	24LM115	TPA	13 Jul 2025

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
Heat transfer medium used : Water

	Environmental		AC Voltage Supply
	(℃)	(%R.H.)	(Volt)
Beginning of Calibration	25	54	222
Finished of Calibration	25	57	226



Front

Position :	Ref. Std. ID No.:
1	4803988-001
2	4803988-002
3	4803988-003
4	4803988-004
5(ref.)	4803988-005

Calibration point (℃)	UUC* Setting (℃)	UUC* Reading (℃)	Average* Standard Reading (℃) Position 1	2	3	4	5 (ref.)	Uncertainty (± ℃)
85.0	85.0	85.0	85.133	85.212	85.150	84.983	85.096	0.22

Calibration point (℃)	Uniformity (℃)	Stability (± ℃)	Coverage Factor *k*
85.0	0.21	0.13	2

Average* : The average of 30 values in each position.
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.
Stability : One-half of the greatest maximum difference of measured temperature at any one probe.
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 %.

-o0o-

SCG

Metrology

SCI ECO Services Company Limited
33/2 Moo 3, T.Banpa, A.Kaengkhoi, Saraburi 18110, Thailand.
Saraburi Tel : +66 3627 3096 Fax : +66 3627 3100
Bangkok Tel : +668 9205 6851 , +669 8247 2360
Website : www.scieco.co.th E-Mail : calibrate@scg.com

NSC-TISI-TIS 17025 CALIBRATION 0344

Certificate No. T240904 Page 1 of 3

Certificate of Calibration

Equipment	: Chamber (Oven)
Manufacturer	: Memmert
Model	: UF 450
Serial No.	: B717.0531
Customer Code	: BKK_EN0273
ID No.	: T8042A4
Customer	: ALS Laboratory Group (Thailand) Co.,Ltd.
	104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan,
	Khet Suan Luang, Bangkok 10250
Customer Location	: Laboratory (Oven Room)
Date of Receipt	: 08 May 2024
Calibrated By	: Preecha Phisassutthikul (Temperature Calibration Manager)
Approved By	: _____ / Nuafun Sungchum (Metrology Manager)
Date of Issue	: 23 MAY 2024

REVIEW BY Siriluk P.
APPROVED BY Siriluk P.
NEXT CAL. DATE 14/11/25

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.

SCG

Metrology

SCI ECO Services Company Limited

33/2 Moo 3, T.Banpa, A.Kaengkhoi, Saraburi 18110, Thailand.

NSC-TISI-TIS 17025 CALIBRATION 0244

Certificate No. T240904 Page 2 of 3

Calibration Report

Equipment : Chamber (Oven)
Date of Calibration : 14 May 2024
Environment : Temperature : 26.5-28.1 °C
Line Voltage : 226.7-229.8 V
Relative Humidity : 51 - 57 %RH

Condition of this results of calibration :

1. 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 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
RTD	100 ohm	21-(CH1-10)	T231955	17 November 2024
DATA LOGGER	34970A	T121	T231955	17 November 2024

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 1 Hour 30 Minute At 104 °C
Fresh Air Damper ☐ Open ☐ Min ☐ Medium ☐ Max
☐ Close
☒ Not Available
5. Adjustment :
(X) without adjustment ( ) after adjustment

Approved By.....

FM-L15 118/18-08-66

SCG

Metrology

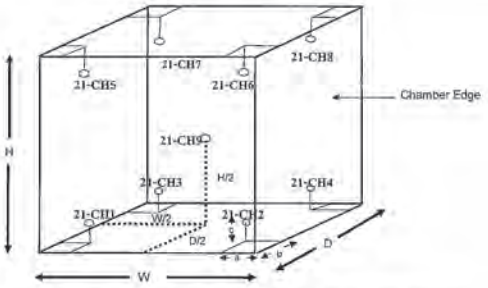
SCI ECO Services Company Limited

33/2 Moo 3, T.Banpa, A.Kaengkhoi, Saraburi 18110, Thailand.

NSC-TISI-TIS 17025 CALIBRATION 0244

Certificate No. T240904 Page 3 of 3

Calibration Report



Remark :
Internal Dimensions of Chamber : W (Width) = 104 cm. , H(Height)=72 cm. and D(Depth)=60 cm.
Size of Installed Standard sensor number21-CH1to number21-CH8 : a = 5 cm. ,b = 5 cm. and c = 5 cm.
Size of Installed Standard sensor number21-CH9 : W/2=104 cm./2 ,H/2=72 cm./2 and D/2=60 cm./2

Measurement Results

Calibration Point	Average Standard Reading at each position (°C)								
	21-CH1	21-CH2	21-CH3	21-CH4	21-CH5	21-CH6	21-CH7	21-CH8	21-CH9
104	103.4	105.0	103.7	103.6	103.3	104.6	103.3	104.0	103.9
180	179.5	181.1	179.2	179.5	179.0	181.3	179.8	179.9	180.2

Chamber (Oven)			Temperature Distribution				
Setting (°C)	Reading (°C)		Average (°C)	Stability (±°C)	Uniformity (°C)	Uncertainty (±°C)	Coverage Factor k
	Min , Max	Average					
104.0	103.9 , 104	104.0	103.85	0.14	1.27	0.64	2.00
180.0	179.9 , 180.1	180.0	179.94	0.38	2.29	0.76	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-L15 118/18-08-66

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
5344 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG, BANGKOK 10250
TEL. 0-2717-3000-24 FAX. 0-2719-9484

ilac-MRA NSC-TISI-TIS17025 CALIBRATION 0008

Certificate of Calibration

Certificate No. : 25PH13
Page : 1 of 2

Equipment : Lux Meter
Manufacturer: Extech
Model : 407026
Serial No.: A060282
ID No.: BKK_FS1344
Condition As-Received: Used Item
Received Date: 09 January 2025
Calibration Date: 14 January 2025

Reference: 2501-0276WSC
Ambient Temperature: (23 ± 2) °C
Relative Humidity: (50 ± 15) %

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.
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 & Encorder	LMguide 9,6 m	120RC003	DL-0064-22	20 Jul 2025
2) STANDARD LAMP	OL FEL-U	F-1784	TP-1007-24	02 Mar 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 .....
APPROVED BY .....
NEXT CAL DATE..... 14/01/26

Calibrated by : Nivat Nitas
Issue Date : 15 January 2025

Approved Signatory : .....
[ ] Phalinee Prabpaipat
[ ] Chatchawan Khunpiluek
[✓] Nuntawat Khamchai

Cert. No.: 25PH13
Page.: 2 of 2

Result of calibration:- (*) Without adjustment ( ) After adjustment

Function : Illuminance Measurement **Range :** 2000 lx

Standard Value	UUC* Reading	Error	Uncertainty
(lx)	(lx)	(lx)	(± lx)
0	0	0	-
15	14	-1	0.60
100	100	0	1.3
500	499	-1	6.5
1000	998	-2	13
1500	1496	-4	20
1900	1895	-5	25

Function : Illuminance Measurement **Range :** 20000 lx

Standard Value	UUC* Reading	Error	Uncertainty
(lx)	(lx)	(lx)	(± lx)
2000	1940	-60	26
3000	2930	-70	39
4000	3850	-150	52
5000	4780	-220	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 %

Light source factor setting mode : L
UUC* = Unit Under Calibration.

-o0o-

TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
5344 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG, BANGKOK 10250
TEL. 0-2717-3000-24 FAX. 0-2719-9384

Certificate of Calibration

Certificate No. : 25PH14
Page : 1 of 2

Equipment : Lux Meter
Manufacturer: Extech
Model : 407026
Serial No.: A-060287
ID No.: BKK_FS1345
Condition As-Received: Used Item
Received Date: 09 January 2025
Calibration Date: 14 January 2025

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.

Reference: 2501-0276WSC
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 & Encorder	LMguide 9,6 m	120RC003	DL-0064-22	20 Jul 2025
2) STANDARD LAMP	OL FEL-U	F-1784	TP-1007-24	02 Mar 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
APPROVED BY
NEXT CAL DATE 14/01/26

Calibrated by : Nivat Nitas
Issue Date : 15 January 2025

Approved Signatory :
[ ] Phalinee Prabpaipal
[ ] Chatchawan Khunpiluek
[✓] Nuntawat Khamchai

Cert. No.: 25PH14
Page.: 2 of 2

Result of calibration:- (*) Without adjustment ( ) After adjustment

Function : Illuminance Measurement **Range :** 2000 lx

Standard Value	UUC* Reading	Error	Uncertainty
(lx)	(lx)	(lx)	(± lx)
0	0	0	-
15	13	-2	0.60
100	100	0	1.3
500	499	-1	6.5
1000	997	-3	13
1500	1496	-4	20
1900	1894	-6	25

Function : Illuminance Measurement **Range :** 20000 lx

Standard Value	UUC* Reading	Error	Uncertainty
(lx)	(lx)	(lx)	(± lx)
2000	1940	-60	26
3000	2920	-80	39
4000	3850	-150	52
5000	4780	-220	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 %

Light source factor setting mode : L
UUC* = Unit Under Calibration.

-o0o-

SITHIPORN ASSOCIATES CO., LTD.
CALIBRATION LABORATORY
451-451/1 Sirinthorn Road, Bangbumru, Bangplud, Bangkok, 10700 Thailand
Tel. +66 2433 8331 Email : calibration@sithiphorn.com

Cert. No. : ACC24056
Pages : 1 of 3

Calibration Certificate

Equipment : SOUND CALIBRATOR
Manufacturer : RION
Model : NC-74
Serial No.: 34425566
ID No.: BKK_FS0617

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)	%

REVIEW BY
APPROVED BY
NEXT CAL DATE 22/10/25

Received Date : 04 OCTOBER 2024
Calibration Date : 22 OCTOBER 2024
Date of Issue : 24 OCTOBER 2024

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.

SITHIPORN ASSOCIATES CO., LTD.
CALIBRATION LABORATORY
451-451/1 Sirinthorn Road, Bangbumru, Bangplud, Bangkok, 10700 Thailand
Tel. +66 2433 8331 Email : calibration@sithiphorn.com

Cert. No. : ACC24056
Job No. : VC67AC0170
Pages : 2 of 3

Calibration Procedure : CP-AC-03

Calibration Method :
This equipment was calibrated by follow on IEC-60942-2003 Standard.
The sound pressure level, frequency and total distortion of the sound calibrator was measured using the reference microphone.

Condition of this result of calibration :
1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
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	33461A	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
Audio Analyzer	AVR-3360A	V744B6069	EF-0009-24	09-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).

SITHIPORN ASSOCIATES CO., LTD.
CALIBRATION LABORATORY
451-451/1 Sirinthorn Road, Bangbumru, Bangplud, Bangkok, 10700 Thailand
Tel. +66 2433 8331 Email : calibration@sithiphorn.com

Result of calibration :

1. Sound pressure level

Specified sound pressure level (dB)	Measured value (dB)	Deviated value (dB)	Uncertainty (dB)	Acceptance limit (dB)
94	94.14	0.14	0.14	0.40

2. Frequency

Specified Frequency (Hz)	Measured value (Hz)	Deviated value (%)	Uncertainty (%)	Acceptance limit (%)
1000	1001.9	0.2	0.1	1.0

3. Total distortion

Measured value (%)	Uncertainty (%)	Acceptance limit (%)
1.12	0.10	3.0

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

SITHIPORN ASSOCIATES CO., LTD.
CALIBRATION LABORATORY
451-451/1 Sirinthorn Road, Bangbumru, Bangplud, Bangkok, 10700 Thailand
Tel. +66 2433 8331 Email : calibration@sithiphorn.com

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No.: 00672737 / 158772 / 58773
ID No.: BKK_FS0927

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) %

REVIEW BY
APPROVED BY
NEXT CAL DATE 21/01/26

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.

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).

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. : ACL25069
Job No. : VC68AC0058
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	16.6
Flat	22.4

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	-1.4	-1.4	-1.4	±5.0

Cert. No. : ACL25069
Job No. : VC68AC0058
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	0.0	-0.1	±1.5
250	-0.1	-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	0.0	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

Cert. No. : ACL25069
Job No. : VC68AC0058
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	134.1	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	25.9	-0.1	± 1.1
25.0	24.9	-0.1	± 1.1

Cert. No. : ACL25069
Job No. : VC68AC0058
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	108.0	0.0	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. : ACL25069
Job No. : VC68AC0058
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		
89.5	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

SITHIPORN ASSOCIATES CO., LTD.
CALIBRATION LABORATORY
451-451/1 Sirinthorn Road, Bangbumru, Bangplud, Bangkok, 10700 Thailand
Tel. +66 2433 8331 Email : calibration@sithiphorn.com

SITHIPORN associates
NSC-TISI-TIS 17025 CALIBRATION 0394

Cert. No. : ACL24345
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No.: 00597159 / 180402 / 88172
ID No.: BKK_FS0995

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) %

REVIEW BY Nanakorn P.
APPROVED BY
NEXT CAL DATE 12/11/25

Received Date : 01 NOVEMBER 2024
Calibration Date : 12 NOVEMBER 2024
Date of Issue : 13 NOVEMBER 2024

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

SITHIPORN ASSOCIATES CO., LTD.
CALIBRATION LABORATORY
451-451/1 Sirinthorn Road, Bangbumru, Bangplud, Bangkok, 10700 Thailand
Tel. +66 2433 8331 Email : calibration@sithiphorn.com

SITHIPORN associates
NSC-TISI-TIS 17025 CALIBRATION 0394

Cert. No. : ACL24345
Job No. : VC68AC0027
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).

T. Petch

SITHIPORN ASSOCIATES CO., LTD.
CALIBRATION LABORATORY
451-451/1 Sirinthorn Road, Bangbumru, Bangplud, Bangkok, 10700 Thailand
Tel. +66 2433 8331 Email : calibration@sithiphorn.com

SITHIPORN associates
NSC-TISI-TIS 17025 CALIBRATION 0394

Cert. No. : ACL24345
Job No. : VC68AC0027
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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CALIBRATION LABORATORY
451-451/1 Sirinthorn Road, Bangbumru, Bangplud, Bangkok, 10700 Thailand
Tel. +66 2433 8331 Email : calibration@sithiphorn.com

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)
15.7

2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency Weighting	Weighting (dB)
A - weight	14.8
C - weight	20.9
Flat	26.4

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	0.2	0.3	0.3	± 1.5
1000	0.1	0.1	0.1	± 1.0
8000	2.4	2.5	2.5	±5.0

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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	-0.1	±2.0
125	-0.1	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	0.0	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	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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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	30.1	0.1	± 1.1
29.0	29.1	0.1	± 1.1
28.0	28.0	0.0	± 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

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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	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

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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		
89.5	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 lavel of confidence of approximately 95 %

End of Calibration Certificate

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Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No.: 00572565 / 170402 / 72903
ID No.: BKK_FS0874

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) %

REVIEW BY .....
APPROVED BY .....
NEXT CAL DATE..... 21/01/26

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)

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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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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. : ACL25067
Job No. : VC68AC0058
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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)
16.5

2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency Weighting	Weighting (dB)
A - weight	14.8
C - weight	21.2
Flat	26.7

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	1.1	1.1	±5.0

Cert. No. : ACL25067
Job No. : VC68AC0058
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	0.0	0.0	±2.0
125	0.0	0.1	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. : ACL25067
Job No. : VC68AC0058
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	53.9	-0.1	± 1.1
49.0	49.0	0.0	± 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	27.0	0.0	± 1.1
26.0	26.1	0.1	± 1.1
25.0	25.2	0.2	± 1.1

Cert. No. : ACL25067
Job No. : VC68AC0058
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	128.1	0.1	±1.0

Cert. No. : ACL25067
Job No. : VC68AC0058
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	133.3	-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		
89.5	89.4	-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 lavel of confidence of approximately 95 %

End of Calibration Certificate

T. Petch.

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Cert. No. : ACL24284
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No.: 00597155 / 180398 / 88168
ID No.: BKK_FS0993

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) %

REVIEW BY Nathakorn P.
APPROVED BY
NEXT CAL. DATE 19/9/25

Received Date : 04 SEPTEMBER 2024
Calibration Date : 19 SEPTEMBER 2024
Date of Issue : 20 SEPTEMBER 2024

Calibrated by : Nathakorn Pisutpaisan

Approved by : T. Petch.
(Thanakul Petchurai)

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Tel. +66 2433 8331 Email : calibration@sithiphorn.com

Cert. No. : ACL24284
Job No. : VC67AC0149
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.

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Cert. No. : ACL24284
Job No. : VC67AC0149
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

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NSC-TISI-TIS 17025 CALIBRATION 0394

Cert. No. : ACL24284
Job No. : VC67AC0149
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)
15.1

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	17.2
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	0.0	0.0	0.0	± 1.5
1000	-0.1	-0.1	-0.1	± 1.0
8000	-0.9	-0.9	-0.8	±5.0

T. Retch.

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NSC-TISI-TIS 17025 CALIBRATION 0394

Cert. No. : ACL24284
Job No. : VC67AC0149
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	0.1	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	94.0	0.0	± 0.3

T. Retch.

SITHIPORN ASSOCIATES CO., LTD.
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NSC-TISI-TIS 17025 CALIBRATION 0394

Cert. No. : ACL24284
Job No. : VC67AC0149
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	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	24.9	-0.1	± 1.1

T. Retch.

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Cert. No. : ACL24284
Job No. : VC67AC0149
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	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	108.0	0.0	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. Retch.

Cert. No. : ACL24284
Job No. : VC67AC0149
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	133.0	133.0	0.0	±3.0
One	136.4	136.4	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	89.6	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 lavel of confidence of approximately 95 %

End of Calibration Certificate

Cert. No. : ACL25068
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No.: 00572566 / 142140 / 22309
ID No.: BKK_FS0875

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) %

REVIEW BY
APPROVED BY
NEXT CAL DATE 21/01/26

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. : ACL25068
Job No. : VC68AC0058
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. : ACL25068
Job No. : VC68AC0058
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. : ACL25068
Job No. : VC68AC0058
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)
15.8

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	21.7
Flat	27.2

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	0.2	0.2	0.2	± 1.0
8000	-0.1	-0.1	-0.1	±5.0

Cert. No. : ACL25068
Job No. : VC68AC0058
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	0.0	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	0.0	-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. : ACL25068
Job No. : VC68AC0058
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	28.2	0.2	± 1.1
27.0	27.2	0.2	± 1.1
26.0	26.2	0.2	± 1.1
25.0	25.2	0.2	± 1.1

Cert. No. : ACL25068
Job No. : VC68AC0058
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
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. : ACL25068
Job No. : VC68AC0058
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	135.2	-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	89.6	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 lavel of confidence of approximately 95 %

End of Calibration Certificate

T. Petch.

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NSC-TISI-TIS 17025 CALIBRATION 0394

Cert. No. : ACL24403
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No.: 00572563 / 170399 / 72900
ID No.: BKK_FS0879

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) %

REVIEW BY Nathakorn P.
APPROVED BY
NEXT CAL DATE 13/12/25

Received Date : 06 DECEMBER 2024
Calibration Date : 13-16 DECEMBER 2024
Date of Issue : 16 DECEMBER 2024

Calibrated by : Nathakorn Pisutpaisan

Approved by : T. Petch.
(Thanakul Petchurai)

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NSC-TISI-TIS 17025 CALIBRATION 0394

Cert. No. : ACL24403
Job No. : VC68AC0045
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.

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NSC-TISI-TIS 17025 CALIBRATION 0394

Cert. No. : ACL24403
Job No. : VC68AC0045
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.

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Tel. +66 2433 8331 Email : calibration@sithiphorn.com

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	16.4
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	0.4	0.5	0.5	± 1.5
1000	0.2	0.2	0.2	± 1.0
8000	-0.9	-0.8	-0.7	±5.0

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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	0.0	0.0	±2.0
125	0.0	0.1	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
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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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	26.1	0.1	± 1.1
25.0	25.1	0.1	± 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	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	128.0	0.0	±1.0

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10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, 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	135.2	-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	89.6	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 lavel of confidence of approximately 95 %

End of Calibration Certificate

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Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No.: 00597161 / 180404 / 88174
ID No.: BKK_FS0996

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) %

REVIEW BY Nonakorn P.
APPROVED BY
NEXT CAL. DATE 23/8/25

Received Date : 09 AUGUST 2024
Calibration Date : 23 AUGUST 2024
Date of Issue : 26 AUGUST 2024

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.

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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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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. : ACL24261
Job No. : VC67AC0139
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	11.6
C - weight	17.7
Flat	23.6

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	0.1	0.1	0.1	± 1.0
8000	0.7	0.7	0.7	±5.0

T. Retch.

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Cert. No. : ACL24261
Job No. : VC67AC0139
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

T. Retch.

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Cert. No. : ACL24261
Job No. : VC67AC0139
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	44.0	0.0	± 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	25.1	0.1	± 1.1

T. Retch.

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Cert. No. : ACL24261
Job No. : VC67AC0139
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. Retch.

Cert. No. : ACL24261
Job No. : VC67AC0139
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	133.3	-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		
89.5	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 lavel of confidence of approximately 95 %

End of Calibration Certificate

Cert. No. : ACL24400
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No.: 00858520 / 158771 / 58772
ID No.: BKK_FS0110

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) %

REVIEW BY Nankorn P.
APPROVED BY
NEXT CAL DATE 13/12/25

Received Date : 06 DECEMBER 2024
Calibration Date : 13-16 DECEMBER 2024
Date of Issue : 16 DECEMBER 2024

Calibrated by : Nathakorn Pisutpaisan

Approved by : (Thanakul Petchurai)

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Cert. No. : ACL24400
Job No. : VC68AC0045
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. : ACL24400
Job No. : VC68AC0045
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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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	10.8
C - weight	16.9
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	0.5	0.6	0.6	± 1.5
1000	0.2	0.2	0.2	± 1.0
8000	-0.7	-0.6	-0.6	±5.0

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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	0.0	0.0	±2.0
125	0.0	0.0	0.1	±1.5
250	0.1	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
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

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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	27.0	0.0	± 1.1
26.0	26.0	0.0	± 1.1
25.0	25.1	0.1	± 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	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	134.1	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

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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	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 (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
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 lavel of confidence of approximately 95 %

End of Calibration Certificate

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Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42A / Microphone UC-52 / Preamplifier NH-24
Serial No.: 00623386 / 198633 / 26414
ID No.: BKK_FS1218

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) %

REVIEW BY .....
APPROVED BY .....
NEXT CAL DATE..... 03/12/25 .....

Received Date : 15 NOVEMBER 2024
Calibration Date : 03-04 DECEMBER 2024
Date of Issue : 04 DECEMBER 2024

Calibrated by : Nathakorn Pisutpaisan

Approved by :
(Thanakul Petchurai)

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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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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. : ACL24383
Job No. : VC68AC0032
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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)
14.2

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	19.2
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	0.4	0.4	0.5	± 1.5
1000	0.2	0.2	0.2	± 1.0
8000	-0.4	-0.3	-0.3	±5.0

T. Retch.

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Cert. No. : ACL24383
Job No. : VC68AC0032
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	-0.1	±2.0
125	-0.1	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	0.0	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

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Cert. No. : ACL24383
Job No. : VC68AC0032
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	136.1	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	129.1	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	109.1	0.1	± 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	30.0	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	24.9	-0.1	± 1.1

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Cert. No. : ACL24383
Job No. : VC68AC0032
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	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
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

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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		
89.5	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 lavel of confidence of approximately 95 %

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Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42A / Microphone UC-52 / Preamplifier NH-24
Serial No.: 00222486 / 198967 / 15317
ID No.: BKK_FS1222

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) %

REVIEW BY ..... Nathakorn P.
APPROVED BY .....
NEXT CAL DATE..... 23/12/25

Received Date : 12 DECEMBER 2024
Calibration Date : 23 - 24 DECEMBER 2024
Date of Issue : 26 DECEMBER 2024

Calibrated by : Nathakorn Pisutpaisan

Approved by : (Thanakul Petchurai)

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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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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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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	19.9
Flat	25.3

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	0.6	0.6	0.6	± 1.5
1000	0.2	0.2	0.2	± 1.0
8000	-1.0	-0.9	-0.9	±5.0

T. Rotch.

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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

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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	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	27.0	0.0	± 1.1
26.0	26.1	0.1	± 1.1
25.0	25.1	0.1	± 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	28.9	-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

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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	133.3	-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		
89.5	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

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Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42A / Microphone UC-52 / Preamplifier NH-24
Serial No.: 00623382 / 198628 / 26410
ID No.: BKK_FS1215

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) %

REVIEW BY Wanlaya P.
APPROVED BY
NEXT CAL DATE 03/12/25

Received Date : 15 NOVEMBER 2024
Calibration Date : 03-04 DECEMBER 2024
Date of Issue : 04 DECEMBER 2024

Calibrated by : Nathakorn Pisutpaisan

Approved by : T. Petch.
(Thanakul Petchurai)

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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.

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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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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	16.8
Flat	22.5

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	-0.2	-0.1	-0.1	±5.0

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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	-0.1	±2.0
125	-0.1	0.0	-0.1	±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	0.0	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	94.0	0.0	± 0.3

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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	135.1	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	129.1	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	109.1	0.1	± 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	30.0	0.0	± 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	24.9	-0.1	± 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	28.9	-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
SEL	0.25	1	99.0	98.8	-0.2	1.5 ; -5.0
	2	8	108.0	107.9	-0.1	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, 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	89.5	-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 lavel of confidence of approximately 95 %

End of Calibration Certificate

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Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24
Serial No.: 00597159 / 180402 / 88172
ID No.: BKK_FS0995

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) %

REVIEW BY Nanakorn P.
APPROVED BY
NEXT CAL DATE 12/11/25

Received Date : 01 NOVEMBER 2024
Calibration Date : 12 NOVEMBER 2024
Date of Issue : 13 NOVEMBER 2024

Calibrated by : Nathakorn Pisutpaisan

Approved by : T. Petch.
(Thanakul Petchurai)

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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).

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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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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)
15.7

2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency Weighting	Weighting (dB)
A - weight	14.8
C - weight	20.9
Flat	26.4

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	0.2	0.3	0.3	± 1.5
1000	0.1	0.1	0.1	± 1.0
8000	2.4	2.5	2.5	±5.0

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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	-0.1	±2.0
125	-0.1	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	0.0	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	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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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	30.1	0.1	± 1.1
29.0	29.1	0.1	± 1.1
28.0	28.0	0.0	± 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

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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	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

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Tel. +66 2433 8331 Email : calibration@sithiporn.com

SITHIPORN associates

NSC-TISI-TIS 17025 CALIBRATION 0394

Cert. No. : ACL24345
Job No. : VC68AC0027
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		
89.5	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 lavel of confidence of approximately 95 %

End of Calibration Certificate

JNAC
JIRANATEE ASSOCIATES CO.,LTD.

Jiranatee Associates Co.,Ltd
63/14-15, 67/35-36
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NSC-TISI-TIS 17025
CALIBRATION 0367

Temperature measurement laboratory
Calibration services department.

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CALIBRATION 0367

CERTIFICATE OF CALIBRATION

Certificate No. : CDT-083-67

MEASUREMENT ITEM : Heat Stress Monitor
MANUFACTURER : Delta OHM
MODEL/TYPE : HD32.2
SERIAL NUMBER : 13032503
ID NUMBER : BKK_FS0651
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 : 15 May 2024
MEASUREMENT DATE : 17 May 2024
ISSUE DATE : 21 May 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 was done by In-House calibration method as WI-CL-001 according to comparison method with standard digital temperature indicator and standard temperature probe. The temperature scale use was based on ITS-90.

Traceability:
The measurement results are traceable to the International System of Units (SI) through National Institute of Metrology Thailand (NIMT) Certificate number: TT-0047-24, Certificate number:ER-0101-23

Reference Used During Calibration:
1. Standard Temperature Probe
Model: STS-100 A500, Serial No.: 667682-09, Due date: 26 Mar 2025
2. Digital Temperature Indicator
Model: DTI-1000-A MK II, Serial No.: 671407-00591 Due date: 14 Sep 2024

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'

Calibrated by:
☐ Mr. Sorawit Thachalad
☐ Miss Jittraporn Lertsomphol
☑ Miss Ruangrumpai Phoommit

Approved signatory:
Mr. Parinya Booncharoen
Calibration Department Manager

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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: 16008223.
Dimension: Diameter 3.3 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.055	20.0	-0.1	0.099
80	25.052	25.0	-0.1	0.099
80	30.047	30.0	0.0	0.099
80	35.031	34.9	-0.1	0.099
80	40.020	39.9	-0.1	0.099

Table 2: This equipment was connected with Globe thermometer probe Model: TP3276.2 S/N: 16008189.
Dimension: Diameter 3.3 mm. Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.055	20.1	0.0	0.099
110	25.052	25.1	0.0	0.099
110	30.047	30.0	0.0	0.099
110	35.031	35.0	0.0	0.099
110	40.020	40.0	0.0	0.099

Table 3: This equipment was connected with temperature probe Model: TP3207.2 S/N: 16010553.
Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.055	20.2	0.1	0.099
75	25.052	25.1	0.0	0.099
75	30.047	30.0	0.0	0.099
75	35.030	34.9	-0.1	0.099
75	40.020	39.8	-0.2	0.099

UUC*: Unit Under Calibration

End of Certificate of Calibration

JNAC
JIRANATEE ASSOCIATES CO.,LTD.

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CALIBRATION 0367

Temperature measurement laboratory
Calibration services department.

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CALIBRATION 0367

CERTIFICATE OF CALIBRATION

Certificate No. : CDT-078-67

MEASUREMENT ITEM : Heat Stress Monitor
MANUFACTURER : Delta OHM
MODEL/TYPE : HD32.2
SERIAL NUMBER : 13024779
ID NUMBER : BKK_FS0640
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 : 29 Apr 2024
MEASUREMENT DATE : 03 May 2024
ISSUE DATE : 06 May 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 was done by In-House calibration method as WI-CL-001 according to comparison method with standard digital temperature indicator and standard temperature probe. The temperature scale use was based on ITS-90.

Traceability:
The measurement results are traceable to the International System of Units (SI) through National Institute of Metrology Thailand (NIMT) Certificate number: TT-0047-24, Certificate number:ER-0101-23

Reference Used During Calibration:
1. Standard Temperature Probe
Model: STS-100 A500, Serial No.: 667682-09, Due date: 26 Mar 2025
2. Digital Temperature Indicator
Model: DTI-1000-A MK II, Serial No.: 671407-00591 Due date: 14 Sep 2024

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'

Calibrated by:
☐ Mr. Sorawit Thachalad
☐ Miss Jittraporn Lertsomphol
☑ Miss Ruangrumpai Phoommit

Approved signatory:
Mr. Parinya Booncharoen
Calibration Department Manager

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JIRANATEE ASSOCIATES CO.,LTD.

Continuation of Certificate of Calibration Number CDT-078-67

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: 13030281.
Dimension: Diameter 3.3 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.063	20.0	-0.1	0.099
80	25.051	25.0	-0.1	0.099
80	30.041	30.0	0.0	0.099
80	35.031	35.0	0.0	0.099
80	40.023	40.0	0.0	0.099

Table 2: This equipment was connected with Globe thermometer probe Model: TP3276.2 S/N: 13030461.
Dimension: Diameter 3.3 mm. Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.062	20.1	0.0	0.099
110	25.051	25.0	-0.1	0.099
110	30.041	30.0	0.0	0.099
110	35.031	35.0	0.0	0.099
110	40.022	40.0	0.0	0.099

Table 3: This equipment was connected with temperature probe Model: TP3207.2 S/N: 13013672.
Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.062	20.2	0.1	0.099
75	25.051	25.0	-0.1	0.099
75	30.042	29.9	-0.1	0.099
75	35.031	34.8	-0.2	0.099
75	40.022	39.7	-0.3	0.099

UUC*: Unit Under Calibration

End of Certificate of Calibration

JIRANATEE ASSOCIATES CO.,LTD.

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Temperature measurement laboratory
Calibration services department.

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Web site: www.jiranatee.com

CERTIFICATE OF CALIBRATION

Certificate No. : CDT-210-67

MEASUREMENT ITEM : Heat Stress Monitor
MANUFACTURER : Delta OHM
MODEL/TYPE : HD32.2
SERIAL NUMBER : 17020557
ID NUMBER : BKK_FS0652
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 : 25 Nov 2024
MEASUREMENT DATE : 16 Dec 2024
ISSUE DATE : 16 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 ....
APPROVED BY ....
NEXT CAL DATE.... 16/12/25

Calibration procedure:
The temperature calibration was done by In-House calibration method as WI-CL-001 according to comparison method with standard digital temperature indicator and standard temperature probe. The temperature scale use was based on ITS-90.

Traceability:
The measurement results are traceable to the international system of units (SI) through National Institute of Metrology Thailand (NIMT) Certificate number: TT-0047-24, Certificate number: ER-0113-24

Reference Used During Calibration:
1. Standard Temperature Probe
Model: STS-100 A500, Serial No.: 667682-09, Due date: 26 Mar 2025
2. Digital Temperature Indicator
Model: DTI-1000-A MK II, Serial No.: 671407-00591 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'

Calibrated by:
☐ Mr. Sorawit Thachalad
☐ Miss Jittraporn Lertsomphol
☑ Miss Ruangrumpai Phoommit

Approved signatory: .....
Ms. 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

JIRANATEE ASSOCIATES CO.,LTD.

Continuation of Certificate of Calibration Number CDT-210-67

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: 13035022.
Dimension: Diameter 3.3 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.065	20.0	-0.1	0.099
80	25.057	25.0	-0.1	0.099
80	30.048	30.0	0.0	0.099
80	35.042	35.0	0.0	0.099
80	40.032	39.9	-0.1	0.099

Table 2: This equipment was connected with Globe thermometer probe Model: TP3276.2, S/N: 13044155.
Dimension: Diameter 3.3 mm. Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.065	19.9	-0.2	0.099
110	25.057	24.8	-0.3	0.099
110	30.048	29.8	-0.2	0.099
110	35.042	34.8	-0.2	0.099
110	40.032	39.8	-0.2	0.099

Table 3: This equipment was connected with temperature probe Model: TP3207.2, S/N: 13044777.
Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.066	19.9	-0.2	0.099
75	25.057	24.8	-0.3	0.099
75	30.048	29.7	-0.3	0.099
75	35.043	34.7	-0.3	0.099
75	40.031	39.6	-0.4	0.099

UUC*: Unit Under Calibration

End of Certificate of Calibration

JIRANATEE ASSOCIATES CO.,LTD.

Accredited calibration laboratory
ISO/IEC 17025:2017
NSC-TISI-TIS 17025
CALIBRATION 0367

Temperature measurement laboratory
Calibration services department.

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Web site: www.jiranatee.com

CERTIFICATE OF CALIBRATION

Certificate No. : CDT-124-67

MEASUREMENT ITEM : Heat Stress Monitor
MANUFACTURER : Delta OHM
MODEL/TYPE : HD32.2
SERIAL NUMBER : 15006698
ID NUMBER : BKK_FS0669
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 : 08 Jul 2024
MEASUREMENT DATE : 19 Jul 2024
ISSUE DATE : 19 Jul 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 ....
APPROVED BY ....
NEXT CAL. DATE 19/7/25

Calibration procedure:
The temperature calibration was done by In-House calibration method as WI-CL-001 according to comparison method with standard digital temperature indicator and standard temperature probe. The temperature scale use was based on ITS-90.

Traceability:
The measurement results are traceable to the international system of units (SI) through National Institute of Metrology Thailand (NIMT) Certificate number: TT-0047-24, Certificate number: ER-0101-23

Reference Used During Calibration:
1. Standard Temperature Probe
Model: STS-100 A500, Serial No.: 667682-09, Due date: 26 Mar 2025
2. Digital Temperature Indicator
Model: DTI-1000-A MK II, Serial No.: 671407-00591 Due date: 14 Sep 2024

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'

Calibrated by:
☐ Mr. Sorawit Thachalad
☑ Miss Jittraporn Lertsomphol
☐ Miss Ruangrumpai Phoommit

Approved signatory: .....
Mr. Parinya Booncharoen
Calibration Department Manager

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JIRANATEE ASSOCIATES CO.,LTD.

Continuation of Certificate of Calibration Number CDT-124-67

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: 15015840. Dimension: Diameter 3.3 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.054	20.2	0.1	0.099
80	25.046	25.2	0.2	0.099
80	30.036	30.2	0.2	0.099
80	35.030	35.2	0.2	0.099
80	40.025	40.1	0.1	0.099

Table 2: This equipment was connected with Globe thermometer probe Model: TP3276.2 S/N: 22035465. Dimension: Diameter 3.3 mm. Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.054	20.2	0.1	0.099
110	25.046	25.2	0.2	0.099
110	30.036	30.2	0.2	0.099
110	35.030	35.2	0.2	0.099
110	40.025	40.2	0.2	0.099

Table 3: This equipment was connected with temperature probe Model: TP3207.2 S/N: 15015490. Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.054	20.4	0.3	0.099
75	25.046	25.2	0.2	0.099
75	30.036	30.1	0.1	0.099
75	35.030	35.1	0.1	0.099
75	40.025	40.0	0.0	0.099

UUC*: Unit Under Calibration

End of Certificate of Calibration

JIRANATEE ASSOCIATES CO.,LTD.

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CALIBRATION 0367

Temperature measurement laboratory
Calibration services department.

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Web site: www.jiranatee.com

CERTIFICATE OF CALIBRATION

Certificate No. : CDT-082-67

MEASUREMENT ITEM	: Heat Stress Monitor
MANUFACTURER	: Delta OHM
MODEL/TYPE	: HD32.2
SERIAL NUMBER	: 13024806
ID NUMBER	: BKK_FS0643
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	: 15 May 2024
MEASUREMENT DATE	: 17 May 2024
ISSUE DATE	: 21 May 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.

19/5/25

Calibration procedure:
The temperature calibration was done by In-House calibration method as WI-CL-001 according to comparison method with standard digital temperature indicator and standard temperature probe. The temperature scale use was based on ITS-90.

Traceability:
The measurement results are traceable to the international system of units (SI) through National Institute of Metrology Thailand (NIMT) Certificate number: TT-0047-24, Certificate number: EA-0103-23

Reference Used During Calibration:
1. Standard Temperature Probe
Model: STS-100 A500, Serial No.: 667602-09, Due date: 26 Mar 2025
2. Digital Temperature Indicator
Model: DTI-1000-A MK II, Serial No.: 671407-00593 Due date: 14 Sep 2024

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'

Calibrated by:
☐ Mr. Sorawit Thachalad
☐ Miss Intraporn Lertsomphol
☑ Miss Ruangrumpai Phoommit

Approved signatory:
Mr. Parinya Booncharoen
Calibration Department Manager

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JIRANATEE ASSOCIATES CO.,LTD.

Continuation of Certificate of Calibration Number CDT-082-67

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: 13030288. Dimension: Diameter 3.3 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.055	20.2	0.1	0.099
80	25.051	25.2	0.1	0.099
80	30.047	30.2	0.2	0.099
80	35.031	35.2	0.2	0.099
80	40.020	40.2	0.2	0.099

Table 2: This equipment was connected with Globe thermometer probe Model: TP3276.2 S/N: 20018889. Dimension: Diameter 3.3 mm. Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.055	20.1	0.1	0.16
110	25.051	25.2	0.1	0.099
110	30.047	30.2	0.2	0.099
110	35.031	35.2	0.2	0.099
110	40.020	40.2	0.2	0.099

Table 3: This equipment was connected with temperature probe Model: TP3207.2 S/N: 13023250. Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.055	20.1	0.0	0.099
75	25.053	25.0	-0.1	0.099
75	30.047	29.8	-0.2	0.099
75	35.031	34.7	-0.3	0.099
75	40.021	39.6	-0.4	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

JIRANATEE ASSOCIATES CO.,LTD.

Accredited calibration laboratory
ISO/IEC 17025:2017
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CALIBRATION 0367

Temperature measurement laboratory
Calibration services department.

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Web site: www.jiranatee.com

CERTIFICATE OF CALIBRATION

Certificate No. : CDT-197-67

MEASUREMENT ITEM	: Heat Stress Monitor
MANUFACTURER	: Delta OHM
MODEL/TYPE	: HD32.2
SERIAL NUMBER	: 16002004
ID NUMBER	: BKK_FS0681
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	: 15 Nov 2024
MEASUREMENT DATE	: 22 Nov 2024
ISSUE DATE	: 25 Nov 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
APPROVED BY
NEXT CAL DATE 22/11/25

Calibration procedure:
The temperature calibration was done by In-House calibration method as WI-CL-001 according to comparison method with standard digital temperature indicator and standard temperature probe. The temperature scale use was based on ITS-90.

Traceability:
The measurement results are traceable to the international system of units (SI) through National Institute of Metrology Thailand (NIMT) Certificate number: TT-0047-24, Certificate number: EA-0113-24

Reference Used During Calibration:
1. Standard Temperature Probe
Model: STS-100 A500, Serial No.: 667683-09, Due date: 26 Mar 2025
2. Digital Temperature Indicator
Model: DTI-1000-A MK II, Serial No.: 671407-00593 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'

Calibrated by:
☐ Mr. Sorawit Thachalad
☐ Miss Intraporn Lertsomphol
☑ Miss Ruangrumpai Phoommit

Approved signatory:
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

JIRANATEE ASSOCIATES CO.,LTD.

Continuation of Certificate of Calibration Number CDT-197-67

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: 16008281.
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	25.059	25.0	-0.1	0.099
80	30.049	30.0	0.0	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: 22035458.
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	25.059	25.1	0.0	0.099
110	30.049	30.1	0.1	0.099
110	35.041	35.1	0.1	0.099
110	40.028	40.0	0.0	0.16

Table 3: This equipment was connected with temperature probe Model: TP3207.2, S/N: 15008020.
Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.067	20.3	0.2	0.099
75	25.059	25.1	0.0	0.099
75	30.049	30.0	0.0	0.099
75	35.041	34.9	-0.1	0.099
75	40.028	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

Jiranatee Associates Co.,Ltd.

JIRANATEE ASSOCIATES CO.,LTD.
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Accredited calibration laboratory
ISO/IEC 17025:2017
NSC-TISI-TIS 17025
CALIBRATION 0367

Temperature measurement laboratory
Calibration services department.

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NSC – TISI – TIS 17025
CALIBRATION 0367

CERTIFICATE OF CALIBRATION

Certificate No. : CDT-124-67

MEASUREMENT ITEM	: Heat Stress Monitor
MANUFACTURER	: Delta OHM
MODEL/TYPE	: HD32.2
SERIAL NUMBER	: 15006698
ID NUMBER	: BKK_FS0669
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	: 08 Jul 2024
MEASUREMENT DATE	: 19 Jul 2024
ISSUE DATE	: 19 Jul 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 Maraleem P
APPROVED BY
NEXT CAL. DATE 19/7/25

Calibration procedure:
The temperature calibration was done by In-House calibration method as WI-CL-001 according to comparison method with standard digital temperature indicator and standard temperature probe. The temperature scale use was based on ITS-90.

Traceability:
The measurement results are traceable to the international system of units (SI) through National Institute of Metrology Thailand (NIMT) Certificate number: TT-0047-24, Certificate number: ER-0101-23

Reference Used During Calibration:
1. Standard Temperature Probe
Model: STS-100 A500, Serial No.: 667682-09, Due date: 26 Mar 2025
2. Digital Temperature Indicator
Model: DTI-1000-A MK II, Serial No.: 671407-00591 Due date: 14 Sep 2024

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'

Calibrated by:
☐ Mr. Sorawit Thachalad
☑ Miss Jittraporn Lertsomphol
☐ Miss Ruangrumpai Phoommit

JIRANATEE ASSOCIATES CO.,LTD.

Approved signatory: .....
Mr. Parinya Booncharoen
Calibration Department Manager

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Continuation of Certificate of Calibration Number CDT-124-67

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: 15015840.
Dimension: Diameter 3.3 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.054	20.2	0.1	0.099
80	25.046	25.2	0.2	0.099
80	30.036	30.2	0.2	0.099
80	35.030	35.2	0.2	0.099
80	40.025	40.1	0.1	0.099

Table 2: This equipment was connected with Globe thermometer probe Model: TP3276.2 S/N: 22035465.
Dimension: Diameter 3.3 mm. Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.054	20.2	0.1	0.099
110	25.046	25.2	0.2	0.099
110	30.036	30.2	0.2	0.099
110	35.030	35.2	0.2	0.099
110	40.025	40.2	0.2	0.099

Table 3: This equipment was connected with temperature probe Model: TP3207.2 S/N: 15015490.
Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.054	20.4	0.3	0.099
75	25.046	25.2	0.2	0.099
75	30.036	30.1	0.1	0.099
75	35.030	35.1	0.1	0.099
75	40.025	40.0	0.0	0.099

UUC*: Unit Under Calibration

End of Certificate of Calibration

Jiranatee Associates Co.,Ltd.

JIRANATEE ASSOCIATES CO.,LTD.

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CALIBRATION 0367

Temperature measurement laboratory
Calibration services department.

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CALIBRATION 0367

CERTIFICATE OF CALIBRATION

Certificate No. : CDT-090-67

MEASUREMENT ITEM	: Heat Stress Monitor
MANUFACTURER	: Delta OHM
MODEL/TYPE	: HD32.2
SERIAL NUMBER	: 22016397
ID NUMBER	: CHM_FS0103
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	: 29 May 2024
MEASUREMENT DATE	: 05 Jun 2024
ISSUE DATE	: 10 Jun 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.

Maraleem P
5/6/25

Calibration procedure:
The temperature calibration was done by In-House calibration method as WI-CL-001 according to comparison method with standard digital temperature indicator and standard temperature probe. The temperature scale use was based on ITS-90.

Traceability:
The measurement results are traceable to the international system of units (SI) through National Institute of Metrology Thailand (NIMT) Certificate number: TT-0047-24, Certificate number: ER-0101-23

Reference Used During Calibration:
1. Standard Temperature Probe
Model: STS-100 A500, Serial No.: 667682-09, Due date: 26 Mar 2025
2. Digital Temperature Indicator
Model: DTI-1000-A MK II, Serial No.: 671407-00591 Due date: 14 Sep 2024

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'

Calibrated by:
☐ Mr. Sorawit Thachalad
☐ Miss Jittraporn Lertsomphol
☑ Miss Ruangrumpai Phoommit

JIRANATEE ASSOCIATES CO.,LTD.

Approved signatory: .....
Mr. Parinya Booncharoen
Calibration Department Manager

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Continuation of Certificate of Calibration Number CDT-090-67

Page 2 of 2 Pages

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: 22025584. Dimension: Diameter 3.3 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.038	20.0	0.0	0.099
80	25.041	25.0	0.0	0.099
80	30.031	30.0	0.0	0.099
80	35.026	35.0	0.0	0.099
80	40.017	39.9	-0.1	0.099

Table 2: This equipment was connected with Globe thermometer probe Model: TP3276.2 S/N: 22023933. Dimension: Diameter 3.3 mm. Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.038	20.1	0.1	0.099
110	25.041	25.1	0.1	0.099
110	30.031	30.1	0.1	0.099
110	35.026	35.0	0.0	0.099
110	40.017	40.0	0.0	0.099

Table 3: This equipment was connected with temperature probe Model: TP3207.2 S/N: 22025050. Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.038	20.0	0.0	0.099
75	25.041	24.9	-0.1	0.099
75	30.031	29.8	-0.2	0.099
75	35.026	34.7	-0.3	0.099
75	40.016	39.7	-0.3	0.099

UUC*: Unit Under Calibration

End of Certificate of Calibration

JNAC
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Calibration services department.

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CALIBRATION 0367

CERTIFICATE OF CALIBRATION

Certificate No. : CDT-211-67

Page 1 of 2 Pages

MEASUREMENT ITEM	: Heat Stress Monitor
MANUFACTURER	: Delta OHM
MODEL/TYPE	: HD32.2
SERIAL NUMBER	: 17020558
ID NUMBER	: BKK_FS0653
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	: 25 Nov 2024
MEASUREMENT DATE	: 16 Dec 2024
ISSUE DATE	: 16 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 was done by In-House calibration method as WI-CL-003 according to comparison method with standard digital temperature indicator and standard temperature probe. The temperature scale use was based on ITS-90.

Traceability:
The measurement results are traceable to the international system of units (SI) through National Institute of Metrology Thailand (NIMT) Certificate number: TT-0047-24, Certificate number: ER-0113-24

Reference Used During Calibration:
1. Standard Temperature Probe
Model: STS-100 A500, Serial No.: 667682-05, Due date: 26 Mar 2025
2. Digital Temperature Indicator
Model: DTI-1000-A MK II, Serial No.: 671407-00591 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 Nipaporn P.
APPROVED BY
NEXT CAL DATE 16/12/25

Calibrated by:
☐ Mr. Sorawit Thachalad
☐ Miss Jittraporn Lertsomphol
☑ Miss Ruangrumpai Phoommit

JNAC
JIRANATEE ASSOCIATES CO.,LTD.

Approved signatory:
Mr. Parinya Booncharoen
Calibration Department Manager

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Continuation of Certificate of Calibration Number CDT-210-67

Page 2 of 2 Pages

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: 13035020. Dimension: Diameter 3.3 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.066	20.2	0.1	0.099
80	25.057	25.2	0.1	0.099
80	30.048	30.2	0.2	0.099
80	35.043	35.2	0.2	0.099
80	40.031	40.1	0.1	0.099

Table 2: This equipment was connected with Globe thermometer probe Model: TP3276.2, S/N: 13044156. Dimension: Diameter 3.3 mm. Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.066	20.2	0.1	0.099
110	25.057	25.2	0.1	0.099
110	30.048	30.2	0.2	0.099
110	35.043	35.1	0.1	0.099
110	40.031	40.1	0.1	0.099

Table 3: This equipment was connected with temperature probe Model: TP3207.2, S/N: 13044778. Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.066	19.8	-0.3	0.099
75	25.057	24.7	-0.4	0.099
75	30.048	29.6	-0.4	0.099
75	35.043	34.6	-0.4	0.099
75	40.031	39.6	-0.4	0.099

UUC*: Unit Under Calibration

End of Certificate of Calibration

JNAC
JIRANATEE ASSOCIATES CO.,LTD.

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CALIBRATION 0367

CERTIFICATE OF CALIBRATION

Certificate No. : CDT-165-67

Page 1 of 2 Pages

MEASUREMENT ITEM	: Heat Stress Monitor
MANUFACTURER	: Delta OHM
MODEL/TYPE	: HD32.2
SERIAL NUMBER	: 13024807
ID NUMBER	: BKK_FS0644
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	: 28 Aug 2024
MEASUREMENT DATE	: 03 Sep 2024
ISSUE DATE	: 04 Sep 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 was done by In-House calibration method as WI-CL-003 according to comparison method with standard digital temperature indicator and standard temperature probe. The temperature scale use was based on ITS-90.

Traceability:
The measurement results are traceable to the international system of units (SI) through National Institute of Metrology Thailand (NIMT) Certificate number: TT-0047-24, Certificate number: ER-0101-23

Reference Used During Calibration:
1. Standard Temperature Probe
Model: STS-100 A500, Serial No.: 667682-09, Due date: 26 Mar 2025
2. Digital Temperature Indicator
Model: DTI-1000-A MK II, Serial No.: 671407-00591 Due date: 14 Sep 2024

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 Nipaporn P.
APPROVED BY
NEXT CAL. DATE 3/9/25

Calibrated by:
☐ Mr. Sorawit Thachalad
☑ Miss Jittraporn Lertsomphol
☐ Miss Ruangrumpai Phoommit

JNAC
JIRANATEE ASSOCIATES CO.,LTD.

Approved signatory:
Mr. Parinya Booncharoen
Calibration Department Manager

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JNAC
JIRANATEE ASSOCIATES CO.,LTD.

Continuation of Certificate of Calibration Number CDT-165-67

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: 13030283. Dimension: Diameter 3.3 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
80	20.051	20.1	0.0	0.099
80	25.055	25.1	0.0	0.099
80	30.043	30.1	0.1	0.099
80	35.027	35.1	0.1	0.099
80	40.006	40.1	0.1	0.099

Table 2: This equipment was connected with Globe thermometer probe Model: TP3276.2 S/N: 22035458. Dimension: Diameter 3.3 mm. Length 205 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.051	20.1	0.0	0.099
110	25.055	25.1	0.0	0.099
110	30.043	30.1	0.1	0.099
110	35.026	35.1	0.1	0.099
110	40.006	40.0	0.0	0.099

Table 3: This equipment was connected with temperature probe Model: TP3207.2 S/N: 13013675. Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
75	20.051	20.2	0.1	0.099
75	25.055	25.0	-0.1	0.099
75	30.043	29.9	-0.1	0.099
75	35.026	34.8	-0.2	0.099
75	40.007	39.7	-0.3	0.099

UUC*: Unit Under Calibration

End of Certificate of Calibration

Jiranatee Associates Co.,Ltd.

INNOVATIVE INSTRUMENT CALIBRATION LAB
INNOVATIVE INSTRUMENT CO., LTD. HEAD OFFICE
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AMPHOE BANG PHLI SAMUT PRAKAN PROVINCE 10540 THAILAND
TEL: 16610-2116-5860-1 FAX: 16610-2116-7140

Certificate of Calibration

Customer

Name : ALS Laboratory Group Thailand Co., Ltd.
Address : 104 Soi Phatthanakan 40, Phatthanakan Road, Suan Luang, Bangkok 10250

Certificate No : 24-AFM-179
Request No : Req-2024-1987

Unit Under Calibration Details

Measurement Item : Air Flow Meter
Manufacturer : MesaLabs
Model : Defender 510-M
Serial Number : 151114
ID : BKK_FS0614
Location of Calibration : LAB 4 AIR VELOCITY METER

Accuracy : 1% of Reading
Sensor Model : -
Sensor Serial Number : -
Instrument Status : Used

Calibration Environment and Details

Temperature : 23 °C ± 3 °C
Humidity : 55 %RH ± 20 %RH
Barometric Pressure : 1013 hPa ± 10 hPa
Received Date : 30 August 2024
Calibration Date : 9 September 2024
Calibration Procedure : In-house method CP-AFM-01 by Comparison technique with Standard Primary Flow Calibrator

REVIEW BY Manakorn P.
APPROVED BY
NEXT CAL. DATE 9/9/25

Reference Standard	Model	Serial Number	Traceble	Due Calibration
Air Flow Meter	Gilibrator 3 Low flow	18501010006	Sensidyne	6 August 2025
Air Flow Meter	Gilibrator 3 Standard flow	19031011003	Sensidyne	2 August 2025
Temperature meter	GT 11	08000057	Qreborn	1 March 2025
Pressure meter	CPG2400	41000KIDU651882	TPA	9 November 2024

Traceability :
This Certificate is traceable to SI Unit through Sensidyne A2LA Accreditation No. 3943.01

Note :
The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor $k = 2$, providing a level of confidence approximately 95 %.

Calibration By : Mr. Noppadon Luangarn, Service Calibration Engineer
Approved By : Mr. Pacit Maihavorn, Calibration Engineer Supervisor
Issue Date : 9 September 2024

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.

INNOVATIVE INSTRUMENT CALIBRATION LAB
INNOVATIVE INSTRUMENT CO., LTD. HEAD OFFICE
7 139 MOO 13, SOI SUNTINAKORN 11 TAMBON BANG KAEO,
AMPHOE BANG PHLI SAMUT PRAKAN PROVINCE 10540 THAILAND
TEL: 16610-2116-5860-1 FAX: 16610-2116-7140

Certificate No : 24-AFM-179
Request No : Req-2024-1987

Result of Calibration : Without Adjustment

Temperature (°C)	Pressure (kPa)	STD (cc/min)	UUC (cc/min)	Error (cc/min)	Uncertainty (cc/min)	MPE (cc/min)	Result
24.70	100.95	100	100.41	0.4	2.8	1.0	N/A
24.90	100.90	502	500.47	-1.5	7.1	5.0	N/A
24.90	100.97	1003	1001.3	-2	14	10.0	N/A
25.00	100.92	2014	2009.9	-4	29	20.1	N/A
25.20	101.03	3043	3038.3	15	44	30.4	N/A
25.30	101.10	4043	4005.1	-38	57	40.4	N/A
25.50	101.15	5052	5003.9	-48	74	50.5	N/A

Note STD : Standard UUC : Unit Under Calibration

- UUC Reference Condition : At atmospheric pressure and room temperature condition
- Flow Rate was corrected for non-standard operating condition by using equation :

$$Q_{meas} = Q_{ref} \times \frac{P_{ref}}{P_{ref}} \times \frac{T_{meas}}{T_{ref}}$$

where Q = Flow Rate P = Absolute Pressure T = Absolute Temperature
Meas = Measurement Condition ref = Standard Condition

* Indicates non accredited

MPE = Maximum Permissible Error (Specified in Manufacturer's Specifications)

N/A = Not Aavailable, Customer does not require a statement of conformity.

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.

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AMPHOE BANG PHLI SAMUT PRAKAN PROVINCE 10540 THAILAND
TEL: 16610-2116-5860-1 FAX: 16610-2116-7140

Certificate No : 24-AFM-179
Request No : Req-2024-1987

Decision Rule for Statements of Conformity

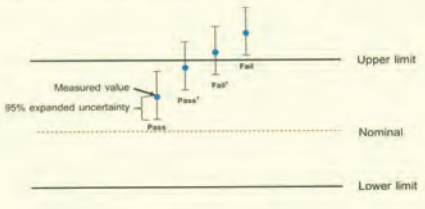
The standard decision rule employed for the statements of conformity to each calibration result will be applied using ILAC-G8:09/2019: Guidelines on the Reporting of Compliance with Specification as following Fig. and statements

Pass = The measurement result plus the expanded uncertainty with a 95% coverage probability were within the limit.

Pass[1] = The measurement result was within the limit. However, a portion of the expanded uncertainty of measurement at 95% exceeds the limit

Fail[1] = 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 Certificate

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TEL: 10660-2116-5860-1 FAX: 10660-2116-7140

Certificate of Calibration

Customer

Name : ALS Laboratory Group Thailand Co., Ltd.

Address : 104 Soi Phatthanakan 40, Phatthanakan Road, Suan Luang, Bangkok 10250

Certificate No : 24-AFM-177

Request No : Req-2024-1862

Unit Under Calibration Details

Measurement Item : Air Flow Meter
Manufacturer : Bios
Model : Defender 510-L
Serial Number : 130026
ID : BKK_FS0619
Location of Calibration : LAB 4 AIR VELOCITY METER

Accuracy : 1% of Reading
Sensor Model : -
Sensor Serial Number : -
Instrument Status : Used

REVIEW BY Nancharee P.
APPROVED BY
NEXT CAL. DATE 9/9/26

Calibration Environment and Details

Temperature : 23 °C ± 3 °C
Humidity : 55 %RH ± 20 %RH
Barometric Pressure : 1013 hPa ± 10 hPa
Received Date : 22 August 2024
Calibration Date : 9 September 2024
Calibration Procedure : In-house method CP-AFM-01 by Comparison technique with Standard Primary Flow Calibrator

Reference Standard	Model	Serial Number	Traceble	Due Calibration
Air Flow Meter	Gilibrator 3 Low flow	18501010006	Sensidyne	6 August 2025
Air Flow Meter	Gilibrator 3 Standard flow	19031011003	Sensidyne	2 August 2025
Temperature meter	GT 11	08000057	Qreborn	1 March 2025
Pressure meter	CPG2400	41000KDU651882	TPA	9 November 2024

Traceability :

This Certificate is traceable to SI Unit through Sensidyne A2LA Accreditation No. 3943.01

Note :

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor $k = 2$, providing a level of confidence approximately 95 %.

Calibration By : Mr. Noppadon Luangart, Service Calibration Engineer

Approved By : Mr. Pacit Mathavorn, Calibration Engineer Supervisor

Issue Date : 9 September 2024

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.

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TEL: 10660-2116-5860-1 FAX: 10660-2116-7140

Certificate No : 24-AFM-177

Request No : Req-2024-1862

Result of Calibration : Without Adjustment

Temperature (°C)	Pressure (kPa)	STD (cc/min)	UUC (cc/min)	Error (cc/min)	Uncertainty (cc/min)	MPE (cc/min)	Result
24.70	100.92	20	20.192	0.2	1.3	0.2	N/A
24.70	100.90	100	99.923	-0.1	2.8	1.0	N/A
24.70	100.94	201	200.7	-0.3	5.6	2.0	N/A
24.70	100.97	298	300.1	2.1	8.4	3.0	N/A
24.70	100.99	403	399.1	-4	11	4.0	N/A
24.80	101.05	482	477.6	-4.4	6.9	4.8	N/A

Note STD : Standard UUC : Unit Under Calibration

- UUC Reference Condition : At atmospheric pressure and room temperature condition
- Flow Rate was corrected for non-standard operating condition by using equation :

$$Q_{meas} = Q_{ref} \times \frac{P_{ref}}{P_{ref}} \times \frac{T_{meas}}{T_{ref}}$$

where Q = Flow Rate P = Absolute Pressure T = Absolute Temperature
Meas = Measurement Condition ref = Standard Condition

* Indicates non accredited

MPE = Maximum Permissible Error (Specified in Manufacturer's Specifications)

N/A = Not Aavailable, Customer does not require a statement of conformity.

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FM-708-AFM-01 Rev.04 Issue date 17/6/24

INNOVATIVE INSTRUMENT CALIBRATION LAB
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AMPHOE BANG PHLI SAMUT PRAKAN PROVINCE 10540 THAILAND
TEL: 10660-2116-5860-1 FAX: 10660-2116-7140

Certificate No : 24-AFM-177

Request No : Req-2024-1862

Decision Rule for Statements of Conformity

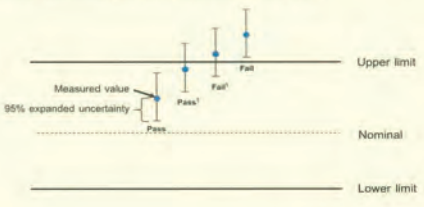
The standard decision rule employed for the statements of conformity to each calibration result will be applied using ILAC-G8:09/2019: Guidelines on the Reporting of Compliance with Specification as following Fig. and statements

Pass = The measurement result plus the expanded uncertainty with a 95% coverage probability were within the limit.

Pass[1] = The measurement result was within the limit. However, a portion of the expanded uncertainty of measurement at 95% exceeds the limit.

Fail[1] = 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 Certificate

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-AFM-01 Rev.04 Issue date 17/6/24

Calibration No. : C-021224-BKK_FS0349

Air Sampling Pump Calibration Report

Air Sampling Pump Detail

Calibration Date	2 Dec 2024	**Next cal.**	2 Mar 2025
Air Sampling Pump II	BKK_FS0349	**Barometic (mmHg)**	756
Serial No.	20170310069	**Temperature (°C)**	25.5

Reference Standard Low Flow Meter

Brand	MesaLabs	**ID**	BKK_FS0619
Model	Defender 510-L	**Serial No.**	130026
Due Date	9-Sep-25		

Reference Standard High Flow Meter

Brand	MesaLabs	**ID**	BKK_FS0614
Model	Defender 510-M	**Serial No.**	151114
Due Date	9-Sep-25		

Calibration Data

Air Sampling Pump setting (cc/min)	Reference Standard Flow Reading (cc/m) 1	2	3	Avg. (cc/min)	Acceptable (cc/min)		Evaluation Pass/ Fail
20	20.0	20.1	20.7	20.3	21	19	Passed
50	50.9	51.4	51.5	51.2	52.5	47.5	Passed
100	100.5	101.3	100.8	100.8	105	95	Passed
200	200.5	201.2	201.5	201.1	210	190	Passed
500	503.1	500.6	503.2	502.3	515	485	Passed
1000	997.4	1000.3	998.9	998.9	1010	990	Passed
2000	2000.5	1995.7	2001.4	1999.2	2020	1980	Passed
2500	2500.7	2504.4	2501.6	2502.2	2550	2450	Passed

Note : Reference Specifications ± 5% of set flow or ± 3% cc/min whichever is Higher

Calibrated by : Phuwich (Mr.Phuwich Promsaard), Enviro Field Services

Approved By : Wichan Choonharat (Mr.Wichan Choonharat), Enviro Field Services Manager

FORM NO.: F 06-115 REVISION NO.: 1 ISSUE DATE: 10/04/24

Calibration No. : C-021224-BKK_FS0355

Air Sampling Pump Calibration Report

Air Sampling Pump Detail

Calibration Date	2 Dec 2024	**Next cal.**	2 Mar 2025
Air Sampling Pump II	BKK_FS0355	**Barometic (mmHg)**	756
Serial No.	20170310075	**Temperature (˚C)**	25.5

Reference Standard Low Flow Meter

Brand	MesaLabs	**ID**	BKK_FS0619
Model	Defender 510-L	**Serial No.**	130026
Due Date	9-Sep-25		

Reference Standard High Flow Meter

Brand	MesaLabs	**ID**	BKK_FS0614
Model	Defender 510-M	**Serial No.**	151114
Due Date	9-Sep-25		

Calibration Data

Air Sampling Pump setting (cc/min)	ference Standard Flow Reading (cc/m			Avg. (cc/min)	Acceptable (cc/min)		Evaluation Pass/ Fail
	1	2	3				
20	20.0	20.2	19.8	20.0	21	19	Passed
50	50.3	50.6	49.5	50.1	52.5	47.5	Passed
100	100.6	100.7	100.5	100.6	105	95	Passed
200	195.6	195.4	195.3	195.4	210	190	Passed
500	487.3	489.8	486.4	487.8	515	485	Passed
1000	1009.5	1005.6	1009.1	1008.1	1010	990	Passed
2000	2001.5	2002.9	2003.7	2002.7	2020	1980	Passed
2500	2492.4	2493.0	2494.4	2493.3	2550	2450	Passed

Note : Reference Specifications ± 5% of set flow or ± 3% cc/min whichever is Higher

Calibrated by : Phuwich

(Mr.Phuwich Promsaard)
Enviro Field Services

Approved By : Wichan Choonharat

(Mr.Wichan Choonharat)
Enviro Field Services Manager

FORM NO.: F 06-115 REVISION NO.: 1 ISSUE DATE: 10/04/24

ALS Laboratory Group (Thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd.,
Phatthanakan, Suan Luang, Bangkok 10250
T +66 2 760 3000 F +66 2 760 3197

Certificate of Calibration

Certificate No. C-140525-CHM_FS0024

Air Sampling Pump Detail

Equipment name	Personal Air Sampling Pump	Equiment ID	CHM_FS0024
Brand	Gilian	Serial No.	20180910119
Model/Type	GilAir Plus	Calibration Date	14-May-25
		Next calibration date	14-Aug-25

Reference Standard Low Flow Meter

Equipment name	Air Flow Meter	Equiment ID	BKK_FS0619
Brand	MesaLabs	Serial No.	130026
Model/Type	Defender 510-L	Calibration Date	9-Sep-24
		Due Date	9-Sep-25

Reference Standard High Flow Meter

Equipment name	Air Flow Meter	Equiment ID	BKK_FS0614
Brand	MesaLabs	Serial No.	151114
Model/Type	Defender 510-M	Calibration Date	9-Sep-24
		Due Date	9-Sep-25

Calibration Data

Air Sampling Pump setting (cc/min)	Reference Std. Flow Reading (cc/min)			Avg. (cc/min)	%Error acceptance	Acceptable range (cc/min)	Evaluation (Pass/ Fail)
	1	2	3				
Low Flow							
20	19.6	19.3	19.5	19.5	5%	19 - 21	Passed
50	50.0	50.6	50.8	50.5	5%	48 - 53	Passed
100	100.1	100.3	100.2	100.2	5%	95 - 105	Passed
200	201.6	201.0	200.8	201.1	5%	190 - 210	Passed
High Flow							
500	503.5	499.8	499.6	501.0	3%	485 - 515	Passed
1000	994.8	991.1	991.8	992.6	3%	970 - 1030	Passed
2000	2001.2	1995.6	2000.1	1999.0	3%	1940 - 2060	Passed
2500	2502.4	2498.2	2507.4	2502.7	3%	2425 - 2575	Passed

---------- END OF REPORT ----------

Calibrated By: Sa

(Mr.Sitthichok Taseeda)
CHM Field Services Scientist (3)

Approved By: Warakorn P.

(Mr.Warakorn Pookrak)
BKK Field Services Supervisor

Issue date : 15-May-25

ALS Laboratory Group (Thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd.,
Phatthanakan, Suan Luang, Bangkok 10250
T +66 2 760 3000 F +66 2 760 3197

Certificate of Calibration

Certificate No. C-140525-CHM_FS0020

Air Sampling Pump Detail

Equipment name	Personal Air Sampling Pump	Equiment ID	CHM_FS0020
Brand	Gilian	Serial No.	20180910115
Model/Type	GilAir Plus	Calibration Date	14-May-25
		Next calibration date	14-Aug-25

Reference Standard Low Flow Meter

Equipment name	Air Flow Meter	Equiment ID	BKK_FS0619
Brand	MesaLabs	Serial No.	130026
Model/Type	Defender 510-L	Calibration Date	9-Sep-24
		Due Date	9-Sep-25

Reference Standard High Flow Meter

Equipment name	Air Flow Meter	Equiment ID	BKK_FS0614
Brand	MesaLabs	Serial No.	151114
Model/Type	Defender 510-M	Calibration Date	9-Sep-24
		Due Date	9-Sep-25

Calibration Data

Air Sampling Pump setting (cc/min)	Reference Std. Flow Reading (cc/min)			Avg. (cc/min)	%Error acceptance	Acceptable range (cc/min)	Evaluation (Pass/ Fail)
	1	2	3				
Low Flow							
20	19.9	20.5	20.6	20.4	5%	19 - 21	Passed
50	49.8	48.9	49.4	49.4	5%	48 - 53	Passed
100	100.5	100.9	100.5	100.6	5%	95 - 105	Passed
200	200.9	203.3	201.5	201.9	5%	190 - 210	Passed
High Flow							
500	504.9	504.6	506.8	505.4	3%	485 - 515	Passed
1000	992.4	996.3	999.2	996.0	3%	970 - 1030	Passed
2000	2010.2	2011.4	2009.8	2010.5	3%	1940 - 2060	Passed
2500	2509.3	2504.9	2499.8	2504.7	3%	2425 - 2575	Passed

---------- END OF REPORT ----------

Calibrated By: Sa

(Mr.Sitthichok Taseeda)
CHM Field Services Scientist (3)

Approved By: Warakorn P.

(Mr.Warakorn Pookrak)
BKK Field Services Supervisor

Issue date : 15-May-25

ALS Laboratory Group (Thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd.,
Phatthanakan, Suan Luang, Bangkok 10250
T +66 2 760 3000 F +66 2 760 3197

Certificate of Calibration

Certificate No. C-250225-CHM_FS0017

Air Sampling Pump Detail

Equipment name	Personal Air Sampling Pump	Equiment ID	CHM_FS0017
Brand	Gilian	Serial No.	20180910112
Model/Type	GilAir Plus	Calibration Date	25-Feb-25
		Next calibration date	25-May-25

Reference Standard Low Flow Meter

Equipment name	Air Flow Meter	Equiment ID	BKK_FS0619
Brand	MesaLabs	Serial No.	130026
Model/Type	Defender 510-L	Calibration Date	9-Sep-24
		Due Date	9-Sep-25

Reference Standard High Flow Meter

Equipment name	Air Flow Meter	Equiment ID	BKK_FS0614
Brand	MesaLabs	Serial No.	151114
Model/Type	Defender 510-M	Calibration Date	9-Sep-24
		Due Date	9-Sep-25

Calibration Data

Air Sampling Pump setting (cc/min)	Reference Std. Flow Reading (cc/min)			Avg. (cc/min)	%Error acceptance	Acceptable range (cc/min)	Evaluation (Pass/ Fail)
	1	2	3				
Low Flow							
20	19.8	20.9	20.8	20.5	5%	19 - 21	Passed
50	49.5	50.0	49.6	49.7	5%	48 - 53	Passed
100	100.7	100.8	100.4	100.6	5%	95 - 105	Passed
200	199.6	199.2	200.7	199.8	5%	190 - 210	Passed
High Flow							
500	506.2	508.7	500.4	505.1	3%	485 - 515	Passed
1000	1003.6	1009.5	1006.0	1006.4	3%	970 - 1030	Passed
2000	2010.2	1998.1	1996.4	2001.6	3%	1940 - 2060	Passed
2500	2505.6	2498.7	2500.6	2501.6	3%	2425 - 2575	Passed

---------- END OF REPORT ----------

Calibrated By: ณัชชกล

(Mr. Natchapon Thamklang)
Field Services

Approved By: Supot S

(Mr. Supot Salamteh)
Field Services Section Head

Issue date : 25-Feb-25

Calibration No. : C-021224-BKK_FS0348

Air Sampling Pump Calibration Report

Air Sampling Pump Detail

Calibration Date	2 Dec 2024	**Next cal.**	2 Mar 2025
Air Sampling Pump II	BKK_FS0348	**Barometic (mmHg)**	756
Serial No.	20170310068	**Temperature (˚C)**	25.5

Reference Standard Low Flow Meter

Brand	MesaLabs	**ID**	BKK_FS0619
Model	Defender 510-L	**Serial No.**	130026
Due Date	9-Sep-25		

Reference Standard High Flow Meter

Brand	MesaLabs	**ID**	BKK_FS0614
Model	Defender 510-M	**Serial No.**	151114
Due Date	9-Sep-25		

Calibration Data

Air Sampling Pump setting (cc/min)	ference Standard Flow Reading (cc/m			Avg. (cc/min)	Acceptable (cc/min)		Evaluation Pass/ Fail
	1	2	3				
20	20.0	20.2	20.0	20.1	21	19	Passed
50	50.4	50.6	50.6	50.6	52.5	47.5	Passed
100	100.8	100.6	100.4	100.6	105	95	Passed
200	196.8	198.6	198.7	198.0	210	190	Passed
500	505.6	505.2	503.6	504.8	515	485	Passed
1000	999.8	999.3	1001.0	1000.0	1010	990	Passed
2000	2011.4	2013.1	2005.8	2010.1	2020	1980	Passed
2500	2496.4	2493.0	2491.5	2493.6	2550	2450	Passed

Note : Reference Specifications ± 5% of set flow or ± 3% cc/min whichever is Higher

Calibrated by : Phuwich
(Mr.Phuwich Promsaard)
Enviro Field Services

Approved By : Wichan Choonharat
(Mr.Wichan Choonharat)
Enviro Field Services Manager

FORM NO.: F 06-115 REVISION NO.: 1 ISSUE DATE: 10/04/24

Page 1 of 1

Calibration No. : C-021224-BKK_FS0354

Air Sampling Pump Calibration Report

Air Sampling Pump Detail

Calibration Date	2 Dec 2024	**Next cal.**	2 Mar 2025
Air Sampling Pump II	BKK_FS0354	**Barometic (mmHg)**	756
Serial No.	20170310074	**Temperature (˚C)**	25.5

Reference Standard Low Flow Meter

Brand	MesaLabs	**ID**	BKK_FS0619
Model	Defender 510-L	**Serial No.**	130026
Due Date	9-Sep-25		

Reference Standard High Flow Meter

Brand	MesaLabs	**ID**	BKK_FS0614
Model	Defender 510-M	**Serial No.**	151114
Due Date	9-Sep-25		

Calibration Data

Air Sampling Pump setting (cc/min)	ference Standard Flow Reading (cc/m			Avg. (cc/min)	Acceptable (cc/min)		Evaluation Pass/ Fail
	1	2	3				
20	20.2	20.2	19.5	20.0	21	19	Passed
50	49.0	49.2	49.5	49.2	52.5	47.5	Passed
100	98.9	98.9	98.1	98.6	105	95	Passed
200	195.7	195.6	195.5	195.6	210	190	Passed
500	511.2	504.6	504.0	506.6	515	485	Passed
1000	1008.0	999.5	1001.8	1003.1	1010	990	Passed
2000	2002.3	2000.9	2001.4	2001.5	2020	1980	Passed
2500	2499.0	2503.5	2496.9	2499.8	2550	2450	Passed

Note : Reference Specifications ± 5% of set flow or ± 3% cc/min whichever is Higher

Calibrated by : Phuwich
(Mr.Phuwich Promsaard)
Enviro Field Services

Approved By : Wichan Choonharat
(Mr.Wichan Choonharat)
Enviro Field Services Manager

FORM NO.: F 06-115 REVISION NO.: 1 ISSUE DATE: 10/04/24

ALS Laboratory Group (Thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd.,
Phatthanakan, Suan Luang, Bangkok 10250
T +66 2 760 3000 F +66 2 760 3197

Certificate of Calibration

Certificate No. C-140525-CHM_FS0023

Air Sampling Pump Detail

Equipment name	Personal Air Sampling Pump	Equiment ID	CHM_FS0023
Brand	Gilian	Serial No.	20180910118
Model/Type	GilAir Plus	Calibration Date	14-May-25
		Next calibration date	14-Aug-25

Reference Standard Low Flow Meter

Equipment name	Air Flow Meter	Equiment ID	BKK_FS0619
Brand	MesaLabs	Serial No.	130026
Model/Type	Defender 510-L	Calibration Date	9-Sep-24
		Due Date	9-Sep-25

Reference Standard High Flow Meter

Equipment name	Air Flow Meter	Equiment ID	BKK_FS0614
Brand	MesaLabs	Serial No.	151114
Model/Type	Defender 510-M	Calibration Date	9-Sep-24
		Due Date	9-Sep-25

Calibration Data

Air Sampling Pump setting (cc/min)	Reference Std. Flow Reading (cc/min)			Avg. (cc/min)	%Error acceptance	Acceptable range (cc/min)	Evaluation (Pass/ Fail)
	1	2	3				
Low Flow							
20	19.0	19.1	19.1	19.1	5%	19 - 21	Passed
50	50.6	50.5	50.7	50.6	5%	48 - 53	Passed
100	101.7	101.6	101.8	101.7	5%	95 - 105	Passed
200	199.5	199.6	195.9	198.3	5%	190 - 210	Passed
High Flow							
500	499.6	499.6	499.7	499.6	3%	485 - 515	Passed
1000	1000.7	1002.8	1000.8	1001.4	3%	970 - 1030	Passed
2000	2014.9	2015.9	2009.8	2013.5	3%	1940 - 2060	Passed
2500	2513.9	2514.1	2518.2	2515.4	3%	2425 - 2575	Passed

---------- END OF REPORT ----------

Calibrated By: Sitthichok
(Mr.Sitthichok Taseeda)
CHM Field Services Scientist (3)

Approved By: Warakorn P.
(Mr.Warakorn Pookrak)
BKK Field Services Supervisor

Issue date : 15-May-25

ALS Laboratory Group (Thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd.,
Phatthanakan, Suan Luang, Bangkok 10250
T +66 2 760 3000 F +66 2 760 3197

Certificate of Calibration

Certificate No. C-250225-CHM_FS0019

Air Sampling Pump Detail

Equipment name	Personal Air Sampling Pump	Equiment ID	CHM_FS0019
Brand	Gilian	Serial No.	20180910114
Model/Type	GilAir Plus	Calibration Date	25-Feb-25
		Next calibration date	25-May-25

Reference Standard Low Flow Meter

Equipment name	Air Flow Meter	Equiment ID	BKK_FS0619
Brand	MesaLabs	Serial No.	130026
Model/Type	Defender 510-L	Calibration Date	9-Sep-24
		Due Date	9-Sep-25

Reference Standard High Flow Meter

Equipment name	Air Flow Meter	Equiment ID	BKK_FS0614
Brand	MesaLabs	Serial No.	151114
Model/Type	Defender 510-M	Calibration Date	9-Sep-24
		Due Date	9-Sep-25

Calibration Data

Air Sampling Pump setting (cc/min)	Reference Std. Flow Reading (cc/min)			Avg. (cc/min)	%Error acceptance	Acceptable range (cc/min)	Evaluation (Pass/ Fail)
	1	2	3				
Low Flow							
20	20.5	20.1	19.9	20.2	5%	19 - 21	Passed
50	50.2	50.7	52.7	51.2	5%	48 - 53	Passed
100	99.3	98.9	100.0	99.4	5%	95 - 105	Passed
200	202.1	201.6	201.8	201.8	5%	190 - 210	Passed
High Flow							
500	508.5	504.8	509.3	507.5	3%	485 - 515	Passed
1000	999.6	999.7	1002.4	1000.6	3%	970 - 1030	Passed
2000	1995.7	1997.6	1999.8	1997.7	3%	1940 - 2060	Passed
2500	2491.2	2492.1	2494.1	2492.5	3%	2425 - 2575	Passed

---------- END OF REPORT ----------

Calibrated By: ณัฐชาพร
(Mr. Natchapon Thamklang)
Field Services

Approved By: Supot S
(Mr. Supot Salamteh)
Field Services Section Head

Issue date : 25-Feb-25

ALS Laboratory Group (Thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd.,
Phatthanakan, Suan Luang, Bangkok 10250
T +66 2 760 3000 F +66 2 760 3197

Certificate of Calibration

Certificate No. C-250225-CHM_FS0018

Air Sampling Pump Detail

Equipment name	Personal Air Sampling Pump	Equiment ID	CHM_FS0018
Brand	Gilian	Serial No.	20180910113
Model/Type	GilAir Plus	Calibration Date	25-Feb-25
		Next calibration date	25-May-25

Reference Standard Low Flow Meter

Equipment name	Air Flow Meter	Equiment ID	BKK_FS0619
Brand	MesaLabs	Serial No.	130026
Model/Type	Defender 510-L	Calibration Date	9-Sep-24
		Due Date	9-Sep-25

Reference Standard High Flow Meter

Equipment name	Air Flow Meter	Equiment ID	BKK_FS0614
Brand	MesaLabs	Serial No.	151114
Model/Type	Defender 510-M	Calibration Date	9-Sep-24
		Due Date	9-Sep-25

Calibration Data

Air Sampling Pump setting (cc/min)	Reference Std. Flow Reading (cc/min)			Avg. (cc/min)	%Error acceptance	Acceptable range (cc/min)	Evaluation (Pass/ Fail)
	1	2	3				
Low Flow							
20	19.4	19.5	19.4	19.4	5%	19 - 21	Passed
50	49.6	49.4	49.5	49.5	5%	48 - 53	Passed
100	99.8	99.6	100.6	100.0	5%	95 - 105	Passed
200	201.1	200.6	200.5	200.7	5%	190 - 210	Passed
High Flow							
500	503.4	500.6	502.6	502.2	3%	485 - 515	Passed
1000	1001.8	1003.8	999.9	1001.8	3%	970 - 1030	Passed
2000	1994.2	1996.0	1997.7	1996.0	3%	1940 - 2060	Passed
2500	2508.2	2508.7	2512.4	2509.8	3%	2425 - 2575	Passed

---------- END OF REPORT ----------

Calibrated By: _____ (Mr. Natchapon Thamklang)
Field Services

Approved By: _____ (Mr. Supot Salamteh)
Field Services Section Head

Issue date : 25-Feb-25

REVIEW BY Autcharawan S.
APPROVED BY Tanyaporn M.
NEXT CAL. DATE 12 Jul 2025 ~~12 Jan 2025~~

ARCHEMICA

Certificate of Calibration

ICS-2100: Anion (ID#659)

This certificate is to verify that instrument below are calibrated

by Archemica Lab Co., Ltd.

ICS-2100 S/N: 15010977

AS-HV S/N: 5450A36659

For

ALS Laboratory Group (Thailand) Co., Ltd.

บริษัท อาร์เคมีก้า แลบ จำกัด
ARCHEMICA LAB CO.,LTD.

Operator Signature: Nutdanai Date: Jan 12, 2024

(Mr.Nutdanai Laekhwan)

Application Chemist

Calibration No. : C-021224-BKK_FS0352

Air Sampling Pump Calibration Report

Air Sampling Pump Detail

Calibration Date	2 Dec 2024	**Next cal.**	2 Mar 2025
Air Sampling Pump II	BKK_FS0352	**Barometic (mmHg)**	756
Serial No.	20170310072	**Temperature (°C)**	25.5

Reference Standard Low Flow Meter

Brand	MesaLabs	**ID**	BKK_FS0619
Model	Defender 510-L	**Serial No.**	130026
Due Date	9-Sep-25		

Reference Standard High Flow Meter

Brand	MesaLabs	**ID**	BKK_FS0614
Model	Defender 510-M	**Serial No.**	151114
Due Date	9-Sep-25		

Calibration Data

Air Sampling Pump setting (cc/min)	ference Standard Flow Reading (cc/m			Avg. (cc/min)	Acceptable (cc/min)		Evaluation Pass/ Fail
	1	2	3				
20	20.8	20.9	20.8	20.9	21	19	Passed
50	51.5	51.9	51.6	51.7	52.5	47.5	Passed
100	100.3	100.5	100.5	100.4	105	95	Passed
200	200.1	200.1	200.5	200.2	210	190	Passed
500	500.6	499.8	500.4	500.3	515	485	Passed
1000	996.1	999.6	994.1	996.6	1010	990	Passed
2000	1993.3	1992.2	1991.8	1992.4	2020	1980	Passed
2500	2494.9	2491.5	2491.9	2492.8	2550	2450	Passed

Note : Reference Specifications ± 5% of set flow or ± 3% cc/min whichever is Higher

Calibrated by : Phuwich
(Mr.Phuwich Promsaard)
Enviro Field Services

Approved By : Wichan Chunharat
(Mr.Wichan Choonharat)
Enviro Field Services Manager

Calibration No. : C-021224-BKK_FS0353

Air Sampling Pump Calibration Report

Air Sampling Pump Detail

Calibration Date	2 Dec 2024	**Next cal.**	2 Mar 2025
Air Sampling Pump II	BKK_FS0353	**Barometic (mmHg)**	756
Serial No.	20170310073	**Temperature (°C)**	25.5

Reference Standard Low Flow Meter

Brand	MesaLabs	**ID**	BKK_FS0619
Model	Defender 510-L	**Serial No.**	130026
Due Date	9-Sep-25		

Reference Standard High Flow Meter

Brand	MesaLabs	**ID**	BKK_FS0614
Model	Defender 510-M	**Serial No.**	151114
Due Date	9-Sep-25		

Calibration Data

Air Sampling Pump setting (cc/min)	ference Standard Flow Reading (cc/m			Avg. (cc/min)	Acceptable (cc/min)		Evaluation Pass/ Fail
	1	2	3				
20	19.6	19.8	19.2	19.5	21	19	Passed
50	50.4	48.4	49.0	49.3	52.5	47.5	Passed
100	97.1	96.7	96.8	96.9	105	95	Passed
200	197.7	197.8	197.7	197.7	210	190	Passed
500	501.1	500.6	501.8	501.2	515	485	Passed
1000	1002.4	1003.7	1005.5	1003.9	1010	990	Passed
2000	2007.7	2008.3	2009.7	2008.6	2020	1980	Passed
2500	2497.2	2499.0	2498.3	2498.2	2550	2450	Passed

Note : Reference Specifications ± 5% of set flow or ± 3% cc/min whichever is Higher

Calibrated by : Phuwich
(Mr.Phuwich Promsaard)
Enviro Field Services

Approved By : Wichan Chunharat
(Mr.Wichan Choonharat)
Enviro Field Services Manager

ALS Laboratory Group (Thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd.,
Phatthanakan, Suan Luang, Bangkok 10250
T +66 2 760 3000 F +66 2 760 3197

Certificate of Calibration

Certificate No. C-250225-CHM_FS0016

Air Sampling Pump Detail

Equipment name : Personal Air Sampling Pump
Brand : Gilian
Model/Type : GilAir Plus

Equiment ID : CHM_FS0016
Serial No. : 20180910111
Calibration Date : 25-Feb-25
Next calibration date : 25-May-25

Reference Standard Low Flow Meter

Equipment name : Air Flow Meter
Brand : MesaLabs
Model/Type : Defender 510-L

Equiment ID : BKK_FS0619
Serial No. : 130026
Calibration Date : 9-Sep-24
Due Date : 9-Sep-25

Reference Standard High Flow Meter

Equipment name : Air Flow Meter
Brand : MesaLabs
Model/Type : Defender 510-M

Equiment ID : BKK_FS0614
Serial No. : 151114
Calibration Date : 9-Sep-24
Due Date : 9-Sep-25

Calibration Data

Air Sampling Pump setting (cc/min)	Reference Std. Flow Reading (cc/min)			Avg. (cc/min)	%Error acceptance	Acceptable range (cc/min)			Evaluation (Pass/ Fail)
	1	2	3						
Low Flow									
20	20.1	20.4	20.9	20.5	5%	19	-	21	Passed
50	49.9	49.7	49.5	49.7	5%	48	-	53	Passed
100	100.5	100.0	99.6	100.0	5%	95	-	105	Passed
200	200.8	200.4	199.6	200.3	5%	190	-	210	Passed
High Flow									
500	501.9	500.0	500.1	500.7	3%	485	-	515	Passed
1000	1004.4	999.4	1003.2	1002.3	3%	970	-	1030	Passed
2000	2001.4	2005.4	2002.1	2003.0	3%	1940	-	2060	Passed
2500	2491.1	2497.1	2496.2	2494.8	3%	2425	-	2575	Passed

---------- END OF REPORT ----------

Calibrated By: _____ (Mr. Natchapon Thamklang)
Field Services

Approved By: _____ (Mr. Supot Salamteh)
Field Services Section Head

Issue date : 25-Feb-25

ALS Laboratory Group (Thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd.,
Phatthanakan, Suan Luang, Bangkok 10250
T +66 2 760 3000 F +66 2 760 3197

Certificate of Calibration

Certificate No. C-250225-CHM_FS0022

Air Sampling Pump Detail

Equipment name : Personal Air Sampling Pump
Brand : Gilian
Model/Type : GilAir Plus

Equiment ID : CHM_FS0022
Serial No. : 20180910117
Calibration Date : 25-Feb-25
Next calibration date : 25-May-25

Reference Standard Low Flow Meter

Equipment name : Air Flow Meter
Brand : MesaLabs
Model/Type : Defender 510-L

Equiment ID : RYG_FS0208
Serial No. : 130027
Calibration Date : 27-Jan-25
Due Date : 26-Jan-26

Reference Standard High Flow Meter

Equipment name : Air Flow Meter
Brand : MesaLabs
Model/Type : Defender 510-M

Equiment ID : BKK_FS0614
Serial No. : 151114
Calibration Date : 9-Sep-24
Due Date : 9-Sep-25

Calibration Data

Air Sampling Pump setting (cc/min)	Reference Std. Flow Reading (cc/min)			Avg. (cc/min)	%Error acceptance	Acceptable range (cc/min)			Evaluation (Pass/ Fail)
	1	2	3						
Low Flow									
20	21.0	20.8	20.7	20.8	5%	19	-	21	Passed
50	49.3	50.3	49.6	49.7	5%	48	-	53	Passed
100	100.5	100.3	101.4	100.7	5%	95	-	105	Passed
200	200.4	199.8	199.7	199.9	5%	190	-	210	Passed
High Flow									
500	502.3	504.5	503.7	503.5	3%	485	-	515	Passed
1000	1011.1	1013.3	1002.9	1009.1	3%	970	-	1030	Passed
2000	2011.0	2008.2	2007.1	2008.8	3%	1940	-	2060	Passed
2500	2499.2	2499.0	2499.6	2499.3	3%	2425	-	2575	Passed

---------- END OF REPORT ----------

Calibrated By: _____ (Mr.Sitthichok Taseeda)
Field Services

Approved By: _____ (Mr.Warakorn Pookrak)
Field Services Supervisor

Issue date : 26-Feb-25

ALS Laboratory Group (Thailand) Co., Ltd.
104 Phatthanakan 40, Phatthanakan Rd.,
Phatthanakan, Suan Luang, Bangkok 10250
T +66 2 760 3000 F +66 2 760 3197

Certificate of Calibration

Certificate No. C-250225-CHM_FS0015

Air Sampling Pump Detail

Equipment name : Personal Air Sampling Pump
Brand : Gilian
Model/Type : GilAir Plus

Equiment ID : CHM_FS0015
Serial No. : 20180910110
Calibration Date : 25-Feb-25
Next calibration date : 25-May-25

Reference Standard Low Flow Meter

Equipment name : Air Flow Meter
Brand : MesaLabs
Model/Type : Defender 510-L

Equiment ID : BKK_FS0619
Serial No. : 130026
Calibration Date : 9-Sep-24
Due Date : 9-Sep-25

Reference Standard High Flow Meter

Equipment name : Air Flow Meter
Brand : MesaLabs
Model/Type : Defender 510-M

Equiment ID : BKK_FS0614
Serial No. : 151114
Calibration Date : 9-Sep-24
Due Date : 9-Sep-25

Calibration Data

Air Sampling Pump setting (cc/min)	Reference Std. Flow Reading (cc/min)			Avg. (cc/min)	%Error acceptance	Acceptable range (cc/min)			Evaluation (Pass/ Fail)
	1	2	3						
Low Flow									
20	20.4	20.1	20.3	20.3	5%	19	-	21	Passed
50	50.8	52.1	51.0	51.3	5%	48	-	53	Passed
100	99.3	99.6	100.1	99.7	5%	95	-	105	Passed
200	199.5	200.2	201.3	200.3	5%	190	-	210	Passed
High Flow									
500	507.2	505.4	507.6	506.7	3%	485	-	515	Passed
1000	1006.0	1001.6	1008.7	1005.4	3%	970	-	1030	Passed
2000	2003.8	2003.2	2001.6	2002.9	3%	1940	-	2060	Passed
2500	2502.5	2505.8	2506.5	2504.9	3%	2425	-	2575	Passed

---------- END OF REPORT ----------

Calibrated By: _____ (Mr. Natchapon Thamklang)
Field Services

Approved By: _____ (Mr. Supot Salamteh)
Field Services Section Head

Issue date : 25-Feb-25

ภาคผนวก จ

สำเนาหนังสือใบอนุญาตขึ้นทะเบียน
ห้องปฏิบัติการวิเคราะห์เอกชน

ที่ อก ๐๓๑๐(๑)/ ๑๖๑๖๘ กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๒๐ พฤศจิกายน ๒๕๖๖

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน ลงวันที่ ๔ สิงหาคม ๒๕๖๖

สิ่งที่ส่งมาด้วย ๑. รายชื่อผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๑ แผ่น
๒. รายชื่อเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๕ แผ่น
๓. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๑ แผ่น

ตามหนังสือที่อ้างถึง บริษัท เอแอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ขอต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ว-๒๐๔ สถานที่ตั้งเลขที่ ๑๐๔ ซอยพัฒนาการ ๔๐ ถนนพัฒนาการ แขวงพัฒนาการ เขตสวนหลวง กรุงเทพมหานคร ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอแอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๖ ราย ตามสิ่งที่ส่งมาด้วย ๑
ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ ๑๘๑ ราย ตามสิ่งที่ส่งมาด้วย ๒
ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย น้ำใต้ดิน อากาศเสีย สิ่งปฏิกูล หรือวัสดุที่ไม่ใช้แล้ว และดิน ตามสิ่งที่ส่งมาด้วย ๓

หนังสือฉบับนี้จะหมดอายุในวันที่ ๒ กันยายน ๒๕๖๙ หากประสงค์จะต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อกรมโรงงานอุตสาหกรรม ภายใน ๓๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ทั้งนี้ สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ที่หน้าเว็บไซต์กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายศิระ จันทร์เฉิด)
นักวิทยาศาสตร์เชี่ยวชาญ รักษาราชการแทน
ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน
กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ
โทร. ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕
โทรสาร ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๙๙
ไปรษณีย์อิเล็กทรอนิกส์ saraban@diw.mail.go.th

Green Industry
"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เอแอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ว-๒๐๔
ที่ อก ๐๓๑๐(๑)/ ๑๖๑๖๘ ลงวันที่ ๒๐ พฤศจิกายน ๒๕๖๖

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๖ ราย

๑) นางสาวยุพาพร จันทร์เปล่ง	ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๑
๒) นางสาวชัชนัย โกมารกุล ณ นคร	ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๒
๓) นายศรายุทธ จิตรานนท์	ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๓
๔) นางสาวกนกกร เอนก	ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๔
๕) นายสุริยา สอนแก้ว	ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๕
๖) นายวิชาญ ชุณหรัต	ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๖

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เอแอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ว-๒๐๔
ที่ อก ๐๓๑๐(๑)/ ๑๖๑๖๘ ลงวันที่ ๒๐ พฤศจิกายน ๒๕๖๖

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๑๘๑ ราย

๑) นายกาจบัณฑิต กิตติศุภวณิชย์ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๑
๒) นายภัทรพล สว่างใจธรรม์ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๒
๓) นายนราธิป เทือกขัยคำ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๓
๔) นายศิริโชค พงษ์ประสม ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๔
๕) นายณัฐวุฒิ ด้วงแพง ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๕
๖) นางสาวจินดา โชจุลธรรม ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๖
๗) นางสาวสาวิตรี น้อยเสงี่ยม ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๗
๘) นางสาวชณัฐกาญจน์ อิ่มชม ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๘
๙) นางสาวนรินทร์ สายเสิง ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๙
๑๐) นางสาวนันทวดี สมบูรณ์ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๐
๑๑) นางสาวศรัณยา เฉลิมธำรงค์ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๑
๑๒) นางสาวธัญญธร มงคลจิรวุฒิ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๒
๑๓) นางสาวศิริลักษณ์ บุนนาค ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๓
๑๔) นายนพพงศ์ จันทรุพันธุ์ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๔
๑๕) นายนรเศรษฐ์ โกมาลย์ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๕
๑๖) นายธันวา จริยา ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๖
๑๗) นางสาวเกศรินทร์ แก้วมั่น ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๗
๑๘) นางสาวสุวิมล ชัยเรืองวุฒิ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๘
๑๙) นางสาวสุชาดา ธรรมถาวร ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๙
๒๐) นางสาวเปมิกา ชัยเดชธนกุล ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๐
๒๑) นางสาวศศิธร หมู่สวัสดิ์ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๑
๒๒) นางสาวเสาวลักษณ์ ภู่นภาอำพร ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๒
๒๓) นายอภิสิทธิ์ สิงหา ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๓
๒๔) นายศักดิ์สิทธิ์ ไพศาลพิสุทธิ์ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๔
๒๕) ว่าที่ร้อยตรีหญิง พรรณิภา ขำเจริญ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๕
๒๖) นางจิลดา คำภูแก้ว ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๖
๒๗) นางสาวอรวรรณ รักยง ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๗
๒๘) นางสาวนพรัตน์ แย้มกรานต์ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๘
๒๙) นายจุลเดช วารินทร์ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๙
๓๐) นางสาวดายุรัตน์ ร้องคำ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๐
๓๑) นายพรมมี ศรีปัตเนตร ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๑
๓๒) นายอุทิศ อุ่นสิม ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๒
๓๓) ว่าที่ร้อยตรี เฉลิมเกียรติ อมรศรีเสริม ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๓
๓๔) นางสาววริยา สร้างนา ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๔
๓๕) นายอนุพงศ์ รัตนศรีประเสริฐ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๕

๓๖) นางสาวจุฑารัตน์...

๓๖) นางสาวจุฑารัตน์ โอนสันเทียะ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๖
๓๗) นางสาวจารุวรรณ พิมพ์อภิกฤติยา ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๗
๓๘) นางสาวปรางค์ทิพย์ กิจไพศาลศักดิ์ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๘
๓๙) นางสาวเตือนใจ ทางกลาง ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๙
๔๐) นางสาวจิราพร ศิริเวช ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๐
๔๑) นายวรากร ผูกรักษ์ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๑
๔๒) นายทนง วิริยะสหกิจ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๒
๔๓) นายธนิต เจนจบ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๓
๔๔) นายคณิศร ขำเพชร ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๔
๔๕) นายภูวิช พรหมสะอาด ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๕
๔๖) นายธนเดช โภคาพิพัฒน์ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๖
๔๗) นายชวฤทธิ์ วงษ์จันทร์ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๗
๔๘) นายอาทิตย์ ศรีเสน ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๘
๔๙) นายเจษดินทร์ คงศักดิไทย ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๔๙
๕๐) นายจรัส บุญยิ่ง ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๐
๕๑) นายธนาณัติ เอนก ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๑
๕๒) นายอภิวัฒน์ ทุมหนู ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๒
๕๓) นางสาวสุภาขวัญ มาก ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๓
๕๔) นางสาวทัตพร ชวาลสมบูรณ์ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๔
๕๕) นางสาวธิติมา บุญเพ็ง ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๕
๕๖) นางสาวภานุมาศ นามวัฒน์ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๖
๕๗) นางสาวอุไรรัตน์ ทึงสร้างแป้น ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๗
๕๘) นายธีรวัฒน์ ปวงสุข ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๘
๕๙) นายอิทธิพล ยะโส ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๕๙
๖๐) นายประพจน์ วรรณชูชัย ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๐
๖๑) นายชยธร พวงทิพย์ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๑
๖๒) นางสาวกนกวรรณ จันทบาล ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๒
๖๓) นายสิทธิโชค ธงเงิน ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๓
๖๔) นางศิลาวรรณ ใจบุญ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๔
๖๕) นางสาวพรรณธิดา พุ่มคง ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๕
๖๖) นายนวภัทร ศรีวิริยะ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๖
๖๗) นายสุวิชา ทองอ่อน ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๗
๖๘) นายวิญญู บุญตะนัย ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๘
๖๙) นายสมบูรณ์ บุตรจันทร์ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๙
๗๐) นายวิรัตน์ ไชยนะรา ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๐
๗๑) นายนฤเบศน์ เพิ่มพูน ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๑
๗๒) นายจิรณัฐ ขาวละออ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๒
๗๓) นายอัสรี นามบุรี ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๓
๗๔) นายอัศวเรศ จ่อสาว ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๔

๗๕) นายประเสริฐ...

๗๕) นายประเสริฐ สุระขันธ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๕
๗๖) นายนุกูล จันทร์เนียม	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๖
๗๗) นายพีรพงษ์ ทองคูณปรีดา	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๗
๗๘) นายนฤพล ทองบุช	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๘
๗๙) นายอนุวัฒน์ ม่วงแพร	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๙
๘๐) นายเจตศราวุฒิ ปัตตะมะ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๘๐
๘๑) นายกฤษณะ สายวรรณ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๘๑
๘๒) นายพิชัย บุญยงค์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๘๒
๘๓) นายภานุพงศ์ โฮมวงศ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๘๓
๘๔) นายสามารถ คุ้มปลี	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๘๔
๘๕) นายสัญชัย โกศรีนาม	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๘๕
๘๖) นายณัฐวุฒิ ศรีประเสริฐ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๘๖
๘๗) นายขวัลธัช นาคพนม	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๘๗
๘๘) นายพงศธร ชัยทิพย์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๘๘
๘๙) นายสิทธิโชค ทาสีดา	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๘๙
๙๐) นายธนากร อินสุตา	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๙๐
๙๑) นางสาววรณิชชา ขาติวันชัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๙๑
๙๒) นางสาวพิมพ์ตะวัน มินากูล	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๙๒
๙๓) นางสาวเพชรัตน์ สิงห์สมบุญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๙๓
๙๔) นางสาวชญานิน พรหมจันทร์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๙๔
๙๕) นายกีรติ ทวีราช	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๙๕
๙๖) นายจักริน หมั่นวิชา	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๙๖
๙๗) นายฉัตรชัย สุขเปีย	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๙๗
๙๘) นายณรนนท์ ต๊ะทองคำ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๙๘
๙๙) นายดุลยพล สนนอก	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๙๙
๑๐๐) นายทักษ์ตนัย อุบลศรี	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๐๐
๑๐๑) นายธนศวร นามะกุณณา	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๐๑
๑๐๒) นายธิติพงศ์ บัวแดง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๐๒
๑๐๓) นายนนทชัย อุปถัมภ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๐๓
๑๐๔) นายนัฐพล คุณสุทธิ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๐๔
๑๐๕) นายนันทวัฒน์ สาริน	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๐๕
๑๐๖) นายปิยะนัฐ พลมะศรี	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๐๖
๑๐๗) นายพงศ์สิริ โสมเขียว	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๐๗
๑๐๘) นายพีรพัฒน์ กำคำ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๐๘
๑๐๙) นายภาณุพงศ์ มานิตย์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๐๙
๑๑๐) นายมงคล ผลาทิพย์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๑๐
๑๑๑) นายสิรินนท์ ทองอั้น	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๑๑
๑๑๒) นายอเนชา ทันสมัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๑๒
๑๑๓) นายอดิศักดิ์ ผมไผ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๑๓

๑๑๔) นายอนันตชัย...

๑๑๔) นายอนันตชัย วีสม	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๑๔
๑๑๕) นายวรวุธ ดีนัก	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๑๕
๑๑๖) นายแสงตะวัน นะตะสัต	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๑๖
๑๑๗) นายยุทธพงศ์ รัตนะ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๑๗
๑๑๘) นายขยัณวุฒิ ไชยฮะนิจ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๑๘
๑๑๙) นายวิศรุต ศรีธรรมมา	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๑๙
๑๒๐) นายนนทกร เผือกผ่อง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๒๐
๑๒๑) นายกำชัย สุทธะ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๒๑
๑๒๒) นางสาวณัฐภรณ์ บุญตะนัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๒๒
๑๒๓) นางสาวพัชรินทร์ แสนสร้อย	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๒๓
๑๒๔) นายไพรวัลย์ เปรี่ยมพิมาย	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๒๔
๑๒๕) นางสาวศุภมาศ ทองมาก	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๒๕
๑๒๖) นางสาวลลิตา จิตรสว่าง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๒๖
๑๒๗) นางสาวขไมพร เสิกภู่เขียว	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๒๗
๑๒๘) นางสาวกฤติมาพร คำมีแก่น	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๒๘
๑๒๙) นางสาวสกุลรัตน์ ภาคภูมิ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๒๙
๑๓๐) นางสาวไพรินทร์ ศรีรูปี	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๓๐
๑๓๑) นางสาวทิพเนตร ผุยปัญญา	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๓๑
๑๓๒) นางสาวสาธิตา ปานทอง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๓๒
๑๓๓) นางสาวอริสา ทองนวล	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๓๓
๑๓๔) นางสาวอรยา ค้าคล่อง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๓๔
๑๓๕) นางสาวขุดาภรณ์ สุนทรสนาน	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๓๕
๑๓๖) นางสาวอัญชลี คำจันทร์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๓๖
๑๓๗) นายบุญฤทธิ์ เอี่ยมเทศ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๓๗
๑๓๘) นางสาวศุภรดา ปั้นมยุรา	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๓๘
๑๓๙) นางสาวพาฤดี คุณนาน	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๓๙
๑๔๐) นางสาวจิราเจต ฟองดา	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๔๐
๑๔๑) นางสาวอารยา มีชัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๔๑
๑๔๒) นางสาววิชชุตา นาคผจญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๔๒
๑๔๓) นางสาวนันทิยา จันทะลุน	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๔๓
๑๔๔) นายกิตติพงศ์ แซ่ลี้	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๔๔
๑๔๕) นายอนุวัติ ภูถวิล	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๔๕
๑๔๖) นายธีรพล แสงทอง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๔๖
๑๔๗) นายศักดิ์พิพัฒน์ บุญมั่น	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๔๗
๑๔๘) นายฐิติวัลค์ เอมอุไร	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๔๘
๑๔๙) นายชัยณรงค์ ศรีบุรินทร์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๔๙
๑๕๐) นางสาวอัจฉราวรรณ สวนสนอง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๕๐
๑๕๑) นางสาวณัฐฐาพร สิงหา	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๕๑
๑๕๒) นายภีมเรศ แหยมโต	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๕๒

๑๕๓) นางสาวอุบล...

๑๕๓) นางสาวอุบล เศิกศิริ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๕๓
๑๕๔) นางสาวมโนรัตน์ ทองบุตร ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๕๔
๑๕๕) นายภาคภูมิ แทนไทย ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๕๕
๑๕๖) นางสาวสุภาณัฐ เมล์พ่วง ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๕๖
๑๕๗) นางสาวพรทิวา สาตาชนม์ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๕๗
๑๕๘) นายเอกวิทย์ วันทะนา ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๕๘
๑๕๙) นายไตรมณฑล ทิพย์วรรณ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๕๙
๑๖๐) นายจิรเมธ ประเสริฐสิริพงศ์ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๖๐
๑๖๑) นายจิรายุส เกษมสุข ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๖๑
๑๖๒) นายจีรศักดิ์ ศรีวิชัย ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๖๒
๑๖๓) นายณัฐกฤษณ์ สะพานแก้ว ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๖๓
๑๖๔) นายบูรณศักดิ์ ปะทิ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๖๔
๑๖๕) นายปัณณวิชญ์ เสมอทรัพย์ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๖๕
๑๖๖) นายพิษณุพงษ์ ไชยา ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๖๖
๑๖๗) นายภัทรพงษ์ มณฑาทอง ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๖๗
๑๖๘) นายวสันต์ ตรีนกุล ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๖๘
๑๖๙) นายภาณุเดช เพชรอุด ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๖๙
๑๗๐) นายอนุกูล วิละแสง ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๗๐
๑๗๑) นายภัทรพงษ์ มีสุข ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๗๑
๑๗๒) นางสาวนุชรี ลีละทีป ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๗๒
๑๗๓) นางสาวสุภาวดี โกศรีนาม ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๗๓
๑๗๔) นางสาวอรณิช เทียนดำ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๗๔
๑๗๕) นางสาวพรเพ็ญ ชอบสอน ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๗๕
๑๗๖) นางสาววันวิสา ขอนพิกุล ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๗๖
๑๗๗) นางสาวอรวรรณ เถาว์ทอง ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๗๗
๑๗๘) นางสาวอัยย์ลิณ เมอร์วิณณ์ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๗๘
๑๗๙) นางสาววิสรา คุ่ยครอง ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๗๙
๑๘๐) นายวุฒิกร ศิริวรรณ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๐
๑๘๑) นางสาวจารุวรรณ กระจ่างพันธุ์ ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๑

สิ่งที่ส่งมาด้วย ๓

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เอแอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ว-๒๐๔
ที่ อก ๐๓๑๐(๑)/ ๑๖๑๖๘ ลงวันที่ ๒๐ พฤศจิกายน ๒๕๖๖

ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๗๔ รายการ

น้ำเสีย จำนวน 60 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldicarb	High-Performance Liquid Chromatographic Method[4]
2	Aldicarb Sulfone	High-Performance Liquid Chromatographic Method[4]
3	Aldicarb Sulfoxide	High-Performance Liquid Chromatographic Method[4]
4	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
5	Arsenic	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[4]
6	Barium	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[4]
7	α-BHC	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
8	β-BHC	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
9	δ-BHC	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
10	γ-BHC	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
11	Biochemical Oxygen Demand	1) 5-Day BOD Test, Azide Modification Method[4] 2) 5-Day BOD Test, Membrane Electrode Method[4]
12	Carbaryl	High-Performance Liquid Chromatographic Method[4]
13	Carbofuran	High-Performance Liquid Chromatographic Method[4]
14	Cadmium	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[4]
15	Chemical Oxygen Demand	1) Closed Reflux, Colorimetric Method[4] 2) Closed Reflux, Tritimetric Method[4]
16	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
17	Chromium	1) Digestion, Inductively Coupled Plasma Method[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[4]
18	Color	ADMI Weighted-Ordinate Spectrophotometric Method[4]

ลำดับที่	สารมลพิษ	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	สารมลพิษ	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 Methods[4]
54	Total Dissolved Solids	Dried at 180 ^{0}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 ^{0}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]

น้ำใต้ดิน...

น้ำใต้ดิน จำนวน 126 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
2	Acetone	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
3	Aldrin	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-ethylhexyl)phthalate...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
18	Bis(2-ethylhexyl)phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
20	Bromoform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
21	Butanol	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[4]
22	Butyl benzyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method[4]
23	Cadmium	1) Digestion, 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	สารมลพิษ	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	สารมลพิษ	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	สารมลพิษ	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-Methylnapthalene	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	สารมลพิษ	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_5-C_8)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[14,25]

110 TPH ($C_{>8}$-C_{16})...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
110	TPH ($C_{>8}$-C_{16})	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[9,22]
111	TPH ($C_{>16}$-C_{35})	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[9,22]
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 (ปล่องระบาย) จำนวน 28 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Antimony	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[5]
2	Arsenic	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[5]
3	Beryllium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[5]
4	Cadmium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method[5]
5	Carbon Monoxide	1) Instrumental Analyzer Method[5] 2) Sampling Bag Non-Dispersive Infrared Method[5]
6	Chlorine	1) Absorption Sampling, Ion Chromatographic Method[5] 2) Isokinetic Sampling, Ion Chromatographic Method [5]
7	Chromium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric 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]

<u>สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว จำนวน 35 รายการ</u>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	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	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[7,16] 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[7,16] 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[7,16] 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[7,8,16,19] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method[7,8, 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[7,16] 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[7,16] 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	DDT	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[1,9,26]

2) Soxhlet...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
		2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26]
		3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
17	Dieldrin	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[7,16]
		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]

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[30]
		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[7,16]
		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[7,16]
		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 Method[10,26]
		3) Automated Soxhlet Extraction, Gas Chromatographic Method[11,26]

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
	- 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	
28	Pentachlorophenol	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]
29	pH	Electrometric Method[23,24]
30	Selenium	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]

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[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
32	Thallium	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]
33	Toxaphene	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]
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[7,16] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
35	Zinc	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]

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[15,25] 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[7,16] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
6	Arsenic	1) Digestion, Inductively Coupled Plasma Method[7,16] 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[7,16] 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[15,25]

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[7,16] 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[15,25]
20	Bromoform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
21	Butanol	Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method[13,25]
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]

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
23	Cadmium	1) Digestion, Inductively Coupled Plasma Method[7,16] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
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[7,16] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
34	Chromium (III)	1) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method[7,8,16,19] 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	สารมลพิษ	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	สารมลพิษ	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	สารมลพิษ	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[13]

73 n-Hexane...

ลำดับที่	สารมลพิษ	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[30]

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
84	Methanol	1) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25] 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[15,25]
87	Methylene Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
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[15,25]
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]

ลำดับที่	สารมลพิษ	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	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
97	Pentachlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[10,26] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method[11,26]
98	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	สารมลพิษ	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[15,25]
104	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
105	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
106	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
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_5–C_8)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
109	TPH ($C_{>8}$– C_{16})	1) Automate Extraction, Gas Chromatographic Method[11,22] 2) Solvent Extraction, Gas Chromatographic Method[12,22] 3) Ultrasonic Extraction, Gas Chromatographic Method[22,31]
110	TPH ($C_{>16}$ – C_{35})	1) Automate Extraction, Gas Chromatographic Method[11,22] 2) Solvent Extraction, Gas Chromatographic Method[12,22] 3) Ultrasonic Extraction, Gas Chromatographic Method[22,31]
111	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
112	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
113	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
114	Trichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]

115 2,4,5-Trichlorophenol...

ลำดับที่	สารมลพิษ	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[15,25]
118	Vanadium	1) Digestion, Inductively Coupled Plasma Method[7,16] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]
119	Vinyl Acetate	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
120	Vinyl Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
121	m-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
122	o-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
123	p-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
124	Xylene (Total)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[15,25]
125	Zinc	1) Digestion, Inductively Coupled Plasma Method[7,16] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method[7,17]

เอกสารอ้างอิง

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ที่ อก ๐๓๑๐(๑)/ ๔ ๑ ๒ ๑

กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๒๕ เมษายน ๒๕๖๗

เรื่อง เปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน ลงวันที่ ๒๙ มีนาคม ๒๕๖๗

ตามคำขอที่อ้างถึง บริษัท เอแอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ว-๒๐๔ สถานที่ตั้งเลขที่ ๑๐๔ ซอยพัฒนาการ ๔๐ ถนนพัฒนาการ แขวงพัฒนาการ เขตสวนหลวง กรุงเทพมหานคร ขอเปลี่ยนแปลงบุคลากร ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้

๑. ให้ยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๓ ราย

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๓) นางสาวศุภรดา ปั้นมยุรา	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๓๘

๒. ให้เพิ่มเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน จำนวน ๑๒ ราย

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๔) นายอำนาจ วงษาเคน	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๕
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อนึ่ง หนังสือฉบับนี้...

อนึ่ง หนังสือฉบับนี้จะหมดอายุพร้อมหนังสือต่ออายุรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ในวันที่ ๒ กันยายน ๒๕๖๙

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ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๑๘ ธันวาคม ๒๕๖๗

เรื่อง ยกเลิกบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน ลงวันที่ ๒ ธันวาคม ๒๕๖๗

ตามคำขอที่อ้างถึง บริษัท เอแอลเอส แลบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ว-๒๐๔ สถานที่ตั้งเลขที่ ๑๐๔ ซอยพัฒนาการ ๔๐ ถนนพัฒนาการ แขวงพัฒนาการ เขตสวนหลวง กรุงเทพมหานคร ขอยกเลิกบุคลากร ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้ยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๘ ราย ได้แก่

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