

ภาคผนวก ค

ใบรับรองผลการวิเคราะห์



PACIFIC
LABORATORY CO., LTD.

Pacific Laboratory Co., Ltd. (License No. 9-272)
14/538 Moo 14 Tambol Bang Bus Thong
Amphoe Bang Bus Thong, Nonthaburi 11110
Tel : 0-2045-2446-7 Fax : 0-2045-3991

ANALYSIS REPORT

Analysis No. : Lab-S 158/2565
Job No. : PCL 0721/65
Report Date : June 20, 2022

Customer Name : บริษัท โลโก้ เทคโนโลยี จำกัด
Address : เลขที่ 417/115 ถนนกาญจนาภิเษก ตำบลพญาอินทร์ อำเภอเมือง จังหวัดนนทบุรี 90230
Sampling Source : ปล่อง Scrubber SC 2101
GPS. Coordinate : UTM 47N 0661153 E, 0759729 N
Air Pollution Control System : Wet scrubber
Sampling Time : 11:45 a.m. - 12:15 p.m.
Sampling Condition : Good
Sampling Method : U.S. EPA Method
Sampling By : Mr. Ocha Boonchard
Analyzed By : Ms. Anothai Suebnueang

Item	Description	Unit	Method of Analysis	Result	Standard
1	Stack Height	m	Measuring Tape	16.00	
2	Stack Diameter	m	Measuring Tape	0.30	
3	Temperature in Stack	°C	U.S. EPA Method 2	31.00	
4	Pressure Stack	mm Hg	U.S. EPA Method 2	756.77	
5	Air Velocity	m/s	U.S. EPA Method 2	5.18	
6	Flow Rate	m³/s	U.S. EPA Method 2	0.16	
7	Oxygen Rate	%	U.S. EPA Method 3	20.80	
8	Carbon dioxide Rate	%	U.S. EPA Method 3	<0.10	
9	Moisture Rate	%	U.S. EPA Method 4	2.92	
10	Formaldehyde ¹	mg/m³	Absorption Sampling, Visible Absorption Spectrophotometric Method	0.005	≤10
11	Emission Rate of Formaldehyde	g/h	Calculate	0.00001	≤0.0053

Remark : 1. ¹ ตรวจพบค่าเกินมาตรฐาน (เมื่อคำนวณเป็นค่าเฉลี่ยรายชั่วโมง) สำหรับค่าเฉลี่ยรายชั่วโมง ค่า 2569 (เกินขีด 31 หน่วย ค่า 2569)
2. ² ตรวจพบค่าเกินมาตรฐาน (เมื่อคำนวณเป็นค่าเฉลี่ยรายชั่วโมง) (LA) ค่าเฉลี่ยรายชั่วโมง ค่าเฉลี่ยรายชั่วโมง
3. ³ ค่าเฉลี่ยรายชั่วโมงค่าเฉลี่ย 1 ชั่วโมง ค่าเฉลี่ยรายชั่วโมง 25 หน่วยค่าเฉลี่ย

(Mr. Rnus Fakto)
Lab. Supervisor No. 9-272-A-7699

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REPORT ANALYSIS REFERS TO SUBMITTED SAMPLE (S) ONLY

Page 2/4



PACIFIC
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14/538 Moo 14 Tambol Bang Bus Thong
Amphoe Bang Bus Thong, Nonthaburi 11110
Tel : 0-2045-2446-7 Fax : 0-2045-3991

ANALYSIS REPORT

Analysis No. : Lab-S 158/2565
Job No. : PCL 0721/65
Report Date : June 20, 2022

Customer Name : บริษัท โลโก้ เทคโนโลยี จำกัด
Address : เลขที่ 417/115 ถนนกาญจนาภิเษก ตำบลพญาอินทร์ อำเภอเมือง จังหวัดนนทบุรี 90230
Sampling Source : ปล่อง Scrubber SC 2301
GPS. Coordinate : UTM 47N 0661106 E, 0759736 N
Sampling Time : 12:20 p.m. - 12:50 p.m.
Air Pollution Control System : Wet scrubber
Sampling Condition : Good
Sampling Method : U.S. EPA Method
Sampling By : Mr. Ocha Boonchard
Analyzed By : Ms. Anothai Suebnueang

Item	Description	Unit	Method of Analysis	Result	Standard
1	Stack Height	m	Measuring Tape	16.00	
2	Stack Diameter	m	Measuring Tape	0.40	
3	Temperature in Stack	°C	U.S. EPA Method 2	38.00	
4	Pressure Stack	mm Hg	U.S. EPA Method 2	756.70	
5	Air Velocity	m/s	U.S. EPA Method 2	6.89	
6	Flow Rate	m³/s	U.S. EPA Method 2	0.81	
7	Oxygen Rate	%	U.S. EPA Method 3	20.80	
8	Carbon dioxide Rate	%	U.S. EPA Method 3	<0.10	
9	Moisture Rate	%	U.S. EPA Method 4	3.13	
10	Formaldehyde ¹	mg/m³	Absorption Sampling, Visible Absorption Spectrophotometric Method	0.006	≤10
11	Emission Rate of Formaldehyde	g/h	Calculate	0.00006	≤0.0053

Remark : 1. ¹ ตรวจพบค่าเกินมาตรฐาน (เมื่อคำนวณเป็นค่าเฉลี่ยรายชั่วโมง) สำหรับค่าเฉลี่ยรายชั่วโมง ค่า 2569 (เกินขีด 31 หน่วย ค่า 2569)
2. ² ตรวจพบค่าเกินมาตรฐาน (เมื่อคำนวณเป็นค่าเฉลี่ยรายชั่วโมง) (LA) ค่าเฉลี่ยรายชั่วโมง ค่าเฉลี่ยรายชั่วโมง
3. ³ ค่าเฉลี่ยรายชั่วโมงค่าเฉลี่ย 1 ชั่วโมง ค่าเฉลี่ยรายชั่วโมง 25 หน่วยค่าเฉลี่ย

(Mr. Rnus Fakto)
Lab. Supervisor No. 9-272-A-7699

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Page 3/4



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14/538 Moo 14 Tambol Bang Bus Thong
Amphoe Bang Bus Thong, Nonthaburi 11110
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ANALYSIS REPORT

Analysis No. : Lab-S 158/2565
Job No. : PCL 0721/65
Report Date : June 20, 2022

Customer Name : บริษัท โลโก้ เทคโนโลยี จำกัด
Address : เลขที่ 417/115 ถนนกาญจนาภิเษก ตำบลพญาอินทร์ อำเภอเมือง จังหวัดนนทบุรี 90230
Sampling Source : ปล่อง Scrubber SC 4021
GPS. Coordinate : UTM 47N 0661187 E, 0759723 N
Sampling Time : 09:56 a.m. - 10:24 a.m.
Air Pollution Control System : Wet scrubber
Sampling Condition : Good
Sampling Method : U.S. EPA Method
Sampling By : Mr. Ocha Boonchard
Analyzed By : Ms. Anothai Suebnueang

Item	Description	Unit	Method of Analysis	Result	Standard
1	Stack Height	m	Measuring Tape	13.20	
2	Stack Diameter	m	Measuring Tape	0.08	
3	Temperature in Stack	°C	U.S. EPA Method 2	29.00	
4	Pressure Stack	mm Hg	U.S. EPA Method 2	756.79	
5	Air Velocity	m/s	U.S. EPA Method 2	3.56	
6	Flow Rate	m³/s	U.S. EPA Method 2	0.03	
7	Oxygen Rate	%	U.S. EPA Method 3	21.00	
8	Carbon dioxide Rate	%	U.S. EPA Method 3	<0.10	
9	Moisture Rate	%	U.S. EPA Method 4	3.10	
10	Formaldehyde ¹	mg/m³	Absorption Sampling, Visible Absorption Spectrophotometric Method	0.001	≤10
11	Emission Rate of Formaldehyde	g/h	Calculate	0.00000001	≤0.000031

Remark : 1. ¹ ตรวจพบค่าเกินมาตรฐาน (เมื่อคำนวณเป็นค่าเฉลี่ยรายชั่วโมง) สำหรับค่าเฉลี่ยรายชั่วโมง ค่า 2569 (เกินขีด 31 หน่วย ค่า 2569)
2. ² ตรวจพบค่าเกินมาตรฐาน (เมื่อคำนวณเป็นค่าเฉลี่ยรายชั่วโมง) (LA) ค่าเฉลี่ยรายชั่วโมง ค่าเฉลี่ยรายชั่วโมง
3. ³ ค่าเฉลี่ยรายชั่วโมงค่าเฉลี่ย 1 ชั่วโมง ค่าเฉลี่ยรายชั่วโมง 25 หน่วยค่าเฉลี่ย

(Mr. Rnus Fakto)
Lab. Supervisor No. 9-272-A-7699

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Page 4/4



Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : P0011133
Project Name : EIA Monitoring
Project Location : May 17, 2022 - May 24, 2022

Lot ID: 2246323
Date Received : May 23, 2022
Date Reported : May 30, 2022
Report Number: 2287907-1

Page 1 of 1

Sample Description : Air Quality
Location : โรงบำบัดน้ำเสีย (A1) (GPS 47N 661993, 761327)
Parameter : Nitrogen dioxide (ppm)
Measurement Date : May 17, 2022 - May 24, 2022
Measurement By : Yongsil Rangsee

Time	2246323-1 May 17, 2022	2246323-2 May 18, 2022	2246323-3 May 19, 2022	2246323-4 May 20, 2022	2246323-5 May 21, 2022	2246323-6 May 22, 2022	2246323-7 May 23, 2022
10:00 AM - 11:00 AM	<0.001	0.005	0.005	0.002	0.004	0.006	0.010
11:00 AM - 12:00 PM	<0.001	0.005	0.002	0.002	0.011	0.011	0.004
12:00 PM - 01:00 PM	<0.001	0.004	<0.001	<0.001	0.002	0.001	0.001
01:00 PM - 02:00 PM	<0.001	0.002	<0.001	<0.001	0.001	<0.001	0.001
02:00 PM - 03:00 PM	<0.001	0.001	<0.001	<0.001	0.002	<0.001	<0.001
03:00 PM - 04:00 PM	<0.001	0.001	<0.001	<0.001	0.001	<0.001	<0.001
04:00 PM - 05:00 PM	0.003	0.002	<0.001	<0.001	0.001	<0.001	0.002
05:00 PM - 06:00 PM	0.005	0.002	<0.001	<0.001	0.002	<0.001	0.001
06:00 PM - 07:00 PM	0.003	0.002	0.005	0.002	0.001	<0.001	0.001
07:00 PM - 08:00 PM	0.003	0.002	0.003	0.001	0.001	<0.001	0.001
08:00 PM - 09:00 PM	0.009	0.002	0.004	0.001	0.002	<0.001	0.004
09:00 PM - 10:00 PM	0.005	0.007	0.003	0.001	0.006	0.001	0.039
10:00 PM - 11:00 PM	0.006	0.008	0.010	0.004	0.002	0.002	0.027
11:00 PM - 12:00 AM	0.005	0.021	0.022	0.010	0.002	0.002	0.018
12:00 AM - 01:00 AM	0.010	0.018	0.012	0.011	0.007	0.003	0.017
01:00 AM - 02:00 AM	0.008	0.014	0.008	0.006	0.007	0.004	0.010
02:00 AM - 03:00 AM	0.004	0.012	0.008	0.007	0.004	0.003	0.007
03:00 AM - 04:00 AM	0.004	0.010	0.007	0.007	0.003	0.004	0.007
04:00 AM - 05:00 AM	0.003	0.007	0.006	0.006	0.006	0.002	0.008
05:00 AM - 06:00 AM	0.006	0.008	0.009	0.003	0.008	0.002	0.011
06:00 AM - 07:00 AM	0.008	0.011	0.012	0.004	0.010	0.002	0.009
07:00 AM - 08:00 AM	0.013	0.027	0.016	0.012	0.009	0.006	0.012
08:00 AM - 09:00 AM	0.012	0.019	0.013	0.016	0.008	0.012	0.018
09:00 AM - 10:00 AM	0.004	0.016	0.008	0.016	0.019	0.007	0.007
Average	0.005	0.009	0.007	0.005	0.005	0.003	0.009
1hr - Maximum	0.013	0.027	0.022	0.016	0.019	0.012	0.039
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 : US EPA Method Part 50 App. F (Chemiluminescence)

Approved by

Saranya Chalertharong
Scientist (4)

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

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S/Reports/Air_Sch/01g (1/10PM)



Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : PO011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246323
Date Received : May 25, 2022
Date Reported : May 30, 2022
Report Number: 2328397-1

Page 1 of 1

Sample Description	Air Quality						
Location	บริเวณถนน (A2) (GPS 47N 660900, 759227)						
Parameter	Nitrogen dioxide (ppm)						
Measurement Date	May 17, 2022 - May 24, 2022						
Measurement by	Yongsil Rangsee						
Time	2246323-8 May 17, 2022	2246323-9 May 18, 2022	2246323-10 May 19, 2022	2246323-11 May 20, 2022	2246323-12 May 21, 2022	2246323-13 May 22, 2022	2246323-14 May 23, 2022
09:00 AM - 10:00 AM	0.001	0.004	0.002	0.004	0.001	0.003	0.004
10:00 AM - 11:00 AM	0.001	0.002	<0.001	<0.001	<0.001	0.001	0.002
11:00 AM - 12:00 PM	<0.001	0.001	0.001	<0.001	<0.001	0.001	0.002
12:00 PM - 01:00 PM	0.006	<0.001	0.002	<0.001	0.001	0.001	0.001
01:00 PM - 02:00 PM	0.004	0.001	0.002	0.001	<0.001	0.001	0.001
02:00 PM - 03:00 PM	0.003	<0.001	0.002	0.002	<0.001	0.001	0.002
03:00 PM - 04:00 PM	0.003	0.001	0.002	0.003	<0.001	0.001	0.001
04:00 PM - 05:00 PM	0.006	0.002	0.002	0.002	<0.001	0.001	0.001
05:00 PM - 06:00 PM	0.004	<0.001	0.002	<0.001	0.001	0.001	0.001
06:00 PM - 07:00 PM	0.002	0.002	<0.001	0.003	<0.001	0.001	<0.001
07:00 PM - 08:00 PM	0.002	<0.001	<0.001	0.002	<0.001	0.001	0.002
08:00 PM - 09:00 PM	0.004	0.002	0.002	0.002	<0.001	0.001	0.003
09:00 PM - 10:00 PM	0.002	0.002	<0.001	0.001	0.001	0.001	0.002
10:00 PM - 11:00 PM	0.001	0.002	0.001	0.003	0.001	0.001	0.005
11:00 PM - 12:00 AM	<0.001	0.005	0.002	0.002	0.002	0.002	0.006
12:00 AM - 01:00 AM	<0.001	0.008	0.004	0.002	0.001	0.002	0.006
01:00 AM - 02:00 AM	<0.001	0.004	0.006	0.003	<0.001	0.002	0.005
02:00 AM - 03:00 AM	<0.001	0.004	0.005	0.002	0.002	0.002	0.004
03:00 AM - 04:00 AM	0.001	0.004	0.004	0.001	0.002	0.002	0.003
04:00 AM - 05:00 AM	<0.001	0.003	0.004	0.002	0.001	0.002	0.003
05:00 AM - 06:00 AM	<0.001	0.003	0.002	0.002	0.002	0.003	0.004
06:00 AM - 07:00 AM	<0.001	0.004	0.004	0.002	0.002	0.001	0.005
07:00 AM - 08:00 AM	0.004	0.008	0.008	<0.001	0.002	0.003	0.010
08:00 AM - 09:00 AM	0.003	0.004	0.006	0.002	0.002	0.002	0.006
Average	0.002	0.003	0.003	0.002	0.001	0.002	0.003
1hr - Maximum	0.006	0.008	0.008	0.004	0.002	0.003	0.010
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 : US EPA Method Part 50 App. F (Chemiluminescence)

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Approved by

Saranya Chalerthamrong
Scientist (4)

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S/Reports_Air SOV/Chk/pt (1.19PM)

1204-31 ENGL



Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : PO011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246323
Date Received : May 25, 2022
Date Reported : May 30, 2022
Report Number: 2328398-1

Page 1 of 1

Sample Description	Air Quality							
Location	บริเวณทางหลวงหมายเลข (A3) (GPS 47N 662212, 759091)							
Parameter	Nitrogen dioxide (ppm)							
Measurement Date	May 17, 2022 - May 24, 2022							
Measurement by	Yongsil Rangsee							
Time	2246323-15 May 17, 2022	2246323-16 May 18, 2022	2246323-17 May 19, 2022	2246323-18 May 20, 2022	2246323-19 May 21, 2022	2246323-20 May 22, 2022	2246323-21 May 23, 2022	2246323-21 May 23, 2022
08:00 AM - 09:00 AM	0.004	0.006	0.025	0.010	0.012	0.008	0.013	
09:00 AM - 10:00 AM	0.003	0.008	0.008	0.003	0.002	0.002	0.004	
10:00 AM - 11:00 AM	0.002	0.006	0.003	<0.001	0.001	0.001	0.002	
11:00 AM - 12:00 PM	0.008	0.005	<0.001	<0.001	<0.001	0.010	0.002	
12:00 PM - 01:00 PM	<0.001	0.002	<0.001	<0.001	<0.001	0.001	0.002	
01:00 PM - 02:00 PM	<0.001	0.001	<0.001	<0.001	<0.001	0.002	<0.001	
02:00 PM - 03:00 PM	<0.001	0.001	<0.001	<0.001	<0.001	0.002	<0.001	
03:00 PM - 04:00 PM	<0.001	0.001	<0.001	<0.001	<0.001	0.001	<0.001	
04:00 PM - 05:00 PM	0.002	0.002	<0.001	<0.001	<0.001	0.002	<0.001	
05:00 PM - 06:00 PM	0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	
06:00 PM - 07:00 PM	0.002	<0.001	<0.001	0.004	<0.001	0.002	0.002	
07:00 PM - 08:00 PM	0.002	<0.001	<0.001	0.001	<0.001	0.001	<0.001	
08:00 PM - 09:00 PM	0.004	0.010	<0.001	0.003	<0.001	<0.001	0.007	
09:00 PM - 10:00 PM	0.003	0.022	<0.001	0.002	<0.001	<0.001	0.034	
10:00 PM - 11:00 PM	0.005	0.023	0.011	0.005	0.002	0.002	0.010	
11:00 PM - 12:00 AM	0.001	0.019	0.008	0.006	0.001	0.003	0.011	
12:00 AM - 01:00 AM	0.003	0.011	0.006	0.014	0.001	0.003	0.007	
01:00 AM - 02:00 AM	0.002	0.011	0.006	0.004	0.003	0.004	0.005	
02:00 AM - 03:00 AM	<0.001	0.007	0.004	0.002	0.003	0.004	0.004	
03:00 AM - 04:00 AM	<0.001	0.003	0.005	0.002	0.004	0.002	0.004	
04:00 AM - 05:00 AM	0.001	0.002	0.007	0.002	0.005	0.002	0.007	
05:00 AM - 06:00 AM	0.003	0.008	0.010	0.004	0.009	0.003	0.011	
06:00 AM - 07:00 AM	0.003	0.013	0.014	0.003	0.009	0.002	0.008	
07:00 AM - 08:00 AM	0.009	0.016	0.013	0.010	0.010	0.004	0.011	
Average	0.003	0.007	0.005	0.003	0.003	0.003	0.006	
1hr - Maximum	0.009	0.023	0.025	0.014	0.012	0.010	0.034	
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 : US EPA Method Part 50 App. F (Chemiluminescence)

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Approved by

Saranya Chalerthamrong
Scientist (4)

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1204-31 ENGL



Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : PO011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246323
Date Received : May 25, 2022
Date Reported : May 30, 2022
Report Number: 2328399-1

Page 1 of 1

Sample Description	Air Quality							
Location	ด้านหน้าทางหลวง (ขนาบซ้าย) (A4) (GPS 47N 664348, 761591)							
Parameter	Nitrogen dioxide (ppm)							
Measurement Date	May 17, 2022 - May 24, 2022							
Measurement by	Yongsil Rangsee							
	2246323-22	2246323-23	2246323-24	2246323-25	2246323-26	2246323-27	2246323-28	
Time	May 17, 2022	May 18, 2022	May 19, 2022	May 20, 2022	May 21, 2022	May 22, 2022	May 23, 2022	
11:00 AM - 12:00 PM	0.001	0.004	0.002	0.002	0.002	0.002	0.002	
12:00 PM - 01:00 PM	0.001	0.002	0.001	0.001	0.002	0.002	0.002	
01:00 PM - 02:00 PM	0.002	0.001	<0.001	0.002	0.002	0.001	0.001	
02:00 PM - 03:00 PM	0.001	0.001	<0.001	0.002	0.002	0.002	0.002	
03:00 PM - 04:00 PM	0.001	0.001	<0.001	<0.001	0.001	0.002	0.002	
04:00 PM - 05:00 PM	<0.001	<0.001	<0.001	0.002	0.001	0.004	0.002	
05:00 PM - 06:00 PM	<0.001	0.002	0.002	0.004	0.001	0.002	0.002	
06:00 PM - 07:00 PM	0.003	0.007	0.003	0.004	0.002	0.002	0.005	
07:00 PM - 08:00 PM	0.003	0.009	0.008	0.006	0.006	0.003	0.009	
08:00 PM - 09:00 PM	0.003	0.005	0.010	0.007	0.006	0.005	0.007	
09:00 PM - 10:00 PM	0.002	0.003	0.011	0.005	0.002	0.008	0.007	
10:00 PM - 11:00 PM	0.002	0.002	0.005	0.007	0.002	0.005	0.003	
11:00 PM - 12:00 AM	0.003	0.002	0.004	0.004	0.003	0.003	0.003	
12:00 AM - 01:00 AM	0.002	0.002	0.004	0.003	0.002	0.002	0.002	
01:00 AM - 02:00 AM	0.002	0.004	0.002	0.002	0.002	0.004	0.004	
02:00 AM - 03:00 AM	0.001	0.002	0.002	0.002	0.002	0.003	0.003	
03:00 AM - 04:00 AM	<0.001	0.003	0.001	0.002	0.001	0.002	0.002	
04:00 AM - 05:00 AM	<0.001	0.002	0.001	0.001	0.002	0.002	0.002	
05:00 AM - 06:00 AM	0.001	0.002	<0.001	0.001	0.002	0.002	0.003	
06:00 AM - 07:00 AM	0.002	0.002	0.002	0.002	0.002	0.002	0.002	
07:00 AM - 08:00 AM	0.002	0.003	0.002	0.002	0.002	0.003	0.004	
08:00 AM - 09:00 AM	0.004	0.003	0.004	0.002	0.002	0.007	0.013	
09:00 AM - 10:00 AM	0.009	<0.001	0.005	0.002	0.003	0.002	0.004	
10:00 AM - 11:00 AM	0.008	0.002	0.004	0.002	0.002	0.002	0.001	
Average	0.002	0.003	0.003	0.003	0.002	0.003	0.004	
1hr - Maximum	0.009	0.009	0.011	0.007	0.006	0.008	0.013	
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 : US EPA Method Part 50 App. F (Chemiluminescence)

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Approved by

Saranya Chalerthamrong
Scientist (4)

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S/Reports_Air SOV/Chk/pt (1.19PM)

1204-31 ENGL



Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : PO011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246326
Date Received : May 25, 2022
Date Reported : Jun 01, 2022
Report Number: 2331328-1

Page 1 of 1

Page 1 of 1

Sample Number	2246326-1		
Parameter	Noise (Leq 24 hrs.)		
Location	บริเวณทางหลวงหมายเลข 40 (GPS 47N 660892, 759222)		
Measurement Date	May 17 - May 18, 2022		
Measurement by	Yongsil Rangsee		
Sound Level meter	Serial No. 572670		
Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	55.2	83.7	39.6
10:00 AM - 11:00 AM	59.7	88.5	39.9
11:00 AM - 12:00 PM	51.7	77.8	39.5
12:00 PM - 01:00 PM	52.8	76.8	39.0
01:00 PM - 02:00 PM	56.7	87.9	38.7
02:00 PM - 03:00 PM	50.8	75.8	38.6
03:00 PM - 04:00 PM	59.1	84.9	46.6
04:00 PM - 05:00 PM	56.4	82.1	50.7
05:00 PM - 06:00 PM	53.3	76.6	45.2
06:00 PM - 07:00 PM	53.9	77.7	46.5
07:00 PM - 08:00 PM	52.0	76.6	47.1
08:00 PM - 09:00 PM	59.5	84.9	42.5
09:00 PM - 10:00 PM	46.6	64.0	42.2
10:00 PM - 11:00 PM	46.6	63.0	42.7
11:00 PM - 12:00 AM	52.3	81.3	40.8
12:00 AM - 01:00 AM	41.7	59.3	39.0
01:00 AM - 02:00 AM	46.4	66.8	42.5
02:00 AM - 03:00 AM	46.0	66.8	42.9
03:00 AM - 04:00 AM	54.0	73.6	43.9
04:00 AM - 05:00 AM	57.6	81.5	49.0
05:00 AM - 06:00 AM	64.4	91.1	47.7
06:00 AM - 07:00 AM	62.8	90.6	43.8
07:00 PM - 08:00 AM	52.8	78.3	41.9
08:00 AM - 09:00 AM	59.3	90.0	43.5
Leq Average 24 hrs. (dB(A))	56.9		
Lmax (dB(A))		91.1	
L90 (dB(A))			42.5
Ldn (dB(A))	64.3		
Standard (dB(A))	70	115	
Reference Method	: ISO1996-1 and 1996-2		
Standard	1. ประกาศกระทรวงมหาดไทยและกรมสุขภาพจิต ฉบับที่ 15 (พ.ศ. 2540) เรื่องการกำหนดมาตรฐานระดับเสียงในชุมชน 2. ประกาศกระทรวงสาธารณสุข เรื่องการกำหนดระดับเสียงการแพทย์ และระดับเสียงที่อาจกระทบต่อการได้ยิน : ราชกิจจานุเบกษา		



Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : P0011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246326
Date Received : May 25, 2022
Date Reported : Jun 01, 2022
Report Number: 2331129-1

Page 1 of 1

Sample Number : 2246326-2
Parameter : Noise (Leq 24 hrs.)
Location : บริเวณทาง 1 กิโลเมตร (N1) (GPS 47N 660892, 759222)
Measurement Date : May 18 - May 19, 2022
Measurement by : Yongsil Rangsee
Sound Level meter : Serial No. 672670

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	51.9	78.0	42.3
10:00 AM - 11:00 AM	59.5	89.2	42.0
11:00 AM - 12:00 PM	50.6	73.4	42.7
12:00 PM - 01:00 PM	52.4	77.9	42.6
01:00 PM - 02:00 PM	54.2	80.1	42.7
02:00 PM - 03:00 PM	51.9	74.0	41.6
03:00 PM - 04:00 PM	63.4	89.1	44.6
04:00 PM - 05:00 PM	54.5	78.9	46.5
05:00 PM - 06:00 PM	57.5	79.7	45.6
06:00 PM - 07:00 PM	54.1	76.9	51.8
07:00 PM - 08:00 PM	54.7	75.2	52.5
08:00 PM - 09:00 PM	54.1	73.4	52.0
09:00 PM - 10:00 PM	56.9	81.3	52.9
10:00 PM - 11:00 PM	54.5	86.0	45.5
11:00 PM - 12:00 AM	46.7	71.7	42.0
12:00 AM - 01:00 AM	49.8	76.8	45.9
01:00 AM - 02:00 AM	49.2	67.6	42.5
02:00 AM - 03:00 AM	45.0	67.1	38.2
03:00 AM - 04:00 AM	51.0	76.6	39.5
04:00 AM - 05:00 AM	53.5	73.1	38.3
05:00 AM - 06:00 AM	62.4	87.5	41.5
06:00 AM - 07:00 AM	62.4	90.3	40.8
07:00 AM - 08:00 AM	50.5	71.1	41.3
08:00 AM - 09:00 AM	58.3	88.3	40.9

Leq Average 24 hrs. (dB(A)) : 56.7
Lmax (dB(A)) : 90.3
L90 (dB(A)) : 42.5
Ldn (dB(A)) : 63.2
Standard (dB(A)) : 70

Reference Method : ISO1996-1 and 1996-2

Standard : 1. ข้อมูลการตรวจวัดที่ได้แสดงมาอยู่ในรูปของแผนที่ (n. 2540) สำหรับผลการตรวจวัดที่ได้แสดงมาอยู่ในรูปของแผนที่
2. ข้อมูลการตรวจวัดที่ได้แสดงมาอยู่ในรูปของแผนที่ (n. 2540) สำหรับผลการตรวจวัดที่ได้แสดงมาอยู่ในรูปของแผนที่
รายงาน น. 2548

Technical Management

Saranya Chalermsamrong
Scientist (4)

Approved by

Supot Salameh
Section Head

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S Vopros_Air Noise (p. 4 of 5) PPM

12044-31/ ENGL



Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : P0011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246326
Date Received : May 25, 2022
Date Reported : Jun 01, 2022
Report Number: 2331130-1

Page 1 of 1

Sample Number : 2246326-3
Parameter : Noise (Leq 24 hrs.)
Location : บริเวณทาง 1 กิโลเมตร (N1) (GPS 47N 660892, 759222)
Measurement Date : May 19 - May 20, 2022
Measurement by : Yongsil Rangsee
Sound Level meter : Serial No. 672670

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	54.1	82.3	41.8
10:00 AM - 11:00 AM	52.9	76.0	40.4
11:00 AM - 12:00 PM	53.1	76.3	39.7
12:00 PM - 01:00 PM	60.2	88.7	39.4
01:00 PM - 02:00 PM	51.9	75.4	39.4
02:00 PM - 03:00 PM	57.4	85.0	40.0
03:00 PM - 04:00 PM	54.7	77.8	42.8
04:00 PM - 05:00 PM	60.1	84.2	46.7
05:00 PM - 06:00 PM	54.8	78.7	43.9
06:00 PM - 07:00 PM	60.2	75.7	43.4
07:00 PM - 08:00 PM	53.9	82.5	42.0
08:00 PM - 09:00 PM	52.8	78.1	44.7
09:00 PM - 10:00 PM	44.1	66.9	37.2
10:00 PM - 11:00 PM	60.2	94.8	39.1
11:00 PM - 12:00 AM	58.9	84.9	43.5
12:00 AM - 01:00 AM	47.0	74.9	39.0
01:00 AM - 02:00 AM	62.0	86.0	35.7
02:00 AM - 03:00 AM	43.0	74.9	36.0
03:00 AM - 04:00 AM	53.9	84.9	36.6
04:00 AM - 05:00 AM	53.7	71.4	37.0
05:00 AM - 06:00 AM	61.4	91.6	42.5
06:00 AM - 07:00 AM	65.2	91.4	42.0
07:00 AM - 08:00 AM	61.0	89.1	42.2
08:00 AM - 09:00 AM	58.7	89.5	41.1

Leq Average 24 hrs. (dB(A)) : 58.0
Lmax (dB(A)) : 94.8
L90 (dB(A)) : 40.4
Ldn (dB(A)) : 65.9
Standard (dB(A)) : 70

Reference Method : ISO1996-1 and 1996-2

Standard : 1. ข้อมูลการตรวจวัดที่ได้แสดงมาอยู่ในรูปของแผนที่ (n. 2540) สำหรับผลการตรวจวัดที่ได้แสดงมาอยู่ในรูปของแผนที่
2. ข้อมูลการตรวจวัดที่ได้แสดงมาอยู่ในรูปของแผนที่ (n. 2540) สำหรับผลการตรวจวัดที่ได้แสดงมาอยู่ในรูปของแผนที่
รายงาน น. 2548

Technical Management

Saranya Chalermsamrong
Scientist (4)

Approved by

Supot Salameh
Section Head

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S Vopros_Air Noise (p. 4 of 5) PPM

12044-31/ ENGL



Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : P0011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246326
Date Received : May 25, 2022
Date Reported : Jun 01, 2022
Report Number: 2331131-1

Page 1 of 1

Sample Number : 2246326-4
Parameter : Noise (Leq 24 hrs.)
Location : บริเวณทาง 1 กิโลเมตร (N1) (GPS 47N 660892, 759222)
Measurement Date : May 20 - May 21, 2022
Measurement by : Yongsil Rangsee
Sound Level meter : Serial No. 672670

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	54.0	82.3	42.0
10:00 AM - 11:00 AM	53.2	76.2	40.7
11:00 AM - 12:00 PM	53.4	76.5	40.8
12:00 PM - 01:00 PM	60.6	89.1	39.6
01:00 PM - 02:00 PM	52.1	75.2	39.8
02:00 PM - 03:00 PM	57.5	84.9	40.1
03:00 PM - 04:00 PM	54.8	77.5	43.0
04:00 PM - 05:00 PM	60.9	86.7	46.7
05:00 PM - 06:00 PM	54.8	78.6	43.8
06:00 PM - 07:00 PM	50.5	76.1	44.0
07:00 PM - 08:00 PM	54.0	82.8	42.1
08:00 PM - 09:00 PM	52.9	77.9	45.2
09:00 PM - 10:00 PM	44.5	66.6	38.0
10:00 PM - 11:00 PM	60.5	95.0	39.7
11:00 PM - 12:00 AM	59.5	85.4	41.7
12:00 AM - 01:00 AM	50.9	80.0	46.0
01:00 AM - 02:00 AM	54.9	85.2	39.8
02:00 AM - 03:00 AM	57.2	86.5	40.3
03:00 AM - 04:00 AM	55.3	82.5	40.8
04:00 AM - 05:00 AM	55.5	80.7	41.2
05:00 AM - 06:00 AM	58.6	86.9	41.3
06:00 AM - 07:00 AM	56.9	82.8	41.0
07:00 AM - 08:00 AM	58.0	82.7	42.1
08:00 AM - 09:00 AM	59.4	87.4	41.5

Leq Average 24 hrs. (dB(A)) : 56.7
Lmax (dB(A)) : 95.0
L90 (dB(A)) : 41.2
Ldn (dB(A)) : 63.6
Standard (dB(A)) : 70

Reference Method : ISO1996-1 and 1996-2

Standard : 1. ข้อมูลการตรวจวัดที่ได้แสดงมาอยู่ในรูปของแผนที่ (n. 2540) สำหรับผลการตรวจวัดที่ได้แสดงมาอยู่ในรูปของแผนที่
2. ข้อมูลการตรวจวัดที่ได้แสดงมาอยู่ในรูปของแผนที่ (n. 2540) สำหรับผลการตรวจวัดที่ได้แสดงมาอยู่ในรูปของแผนที่
รายงาน น. 2548

Technical Management

Saranya Chalermsamrong
Scientist (4)

Approved by

Supot Salameh
Section Head

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S Vopros_Air Noise (p. 4 of 5) PPM

12044-31/ ENGL



Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : P0011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246326
Date Received : May 25, 2022
Date Reported : Jun 01, 2022
Report Number: 2331132-1

Page 1 of 1

Sample Number : 2246326-5
Parameter : Noise (Leq 24 hrs.)
Location : บริเวณทาง 1 กิโลเมตร (N1) (GPS 47N 660892, 759222)
Measurement Date : May 21 - May 22, 2022
Measurement by : Yongsil Rangsee
Sound Level meter : Serial No. 672670

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	55.5	86.1	40.3
10:00 AM - 11:00 AM	57.7	86.9	40.9
11:00 AM - 12:00 PM	56.0	83.2	41.5
12:00 PM - 01:00 PM	55.1	81.5	41.7
01:00 PM - 02:00 PM	59.5	88.0	41.9
02:00 PM - 03:00 PM	57.2	82.4	41.6
03:00 PM - 04:00 PM	57.9	81.9	42.8
04:00 PM - 05:00 PM	60.0	87.7	44.0
05:00 PM - 06:00 PM	56.1	84.2	44.2
06:00 PM - 07:00 PM	53.8	82.7	42.1
07:00 PM - 08:00 PM	58.4	85.3	42.1
08:00 PM - 09:00 PM	48.4	72.2	40.5
09:00 PM - 10:00 PM	50.5	80.3	41.3
10:00 PM - 11:00 PM	45.6	77.5	37.4
11:00 PM - 12:00 AM	40.3	57.7	36.0
12:00 AM - 01:00 AM	47.1	75.6	39.3
01:00 AM - 02:00 AM	62.2	86.1	37.6
02:00 AM - 03:00 AM	43.2	75.4	37.3
03:00 AM - 04:00 AM	54.3	85.8	36.8
04:00 AM - 05:00 AM	53.8	71.0	38.2
05:00 AM - 06:00 AM	61.8	92.4	43.6
06:00 AM - 07:00 AM	65.6	92.5	42.9
07:00 AM - 08:00 AM	61.3	89.3	42.6
08:00 AM - 09:00 AM	64.1	90.3	45.2

Leq Average 24 hrs. (dB(A)) : 58.6
Lmax (dB(A)) : 92.5
L90 (dB(A)) : 41.5
Ldn (dB(A)) : 65.5
Standard (dB(A)) : 70

Reference Method : ISO1996-1 and 1996-2

Standard : 1. ข้อมูลการตรวจวัดที่ได้แสดงมาอยู่ในรูปของแผนที่ (n. 2540) สำหรับผลการตรวจวัดที่ได้แสดงมาอยู่ในรูปของแผนที่
2. ข้อมูลการตรวจวัดที่ได้แสดงมาอยู่ในรูปของแผนที่ (n. 2540) สำหรับผลการตรวจวัดที่ได้แสดงมาอยู่ในรูปของแผนที่
รายงาน น. 2548

Technical Management

Saranya Chalermsamrong
Scientist (4)

Approved by

Supot Salameh
Section Head

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S Vopros_Air Noise (p. 4 of 5) PPM

12044-31/ ENGL



Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : P0011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246326
Date Received : May 25, 2022
Date Reported : Jun 01, 2022
Report Number: 2331133-1

Page 1 of 1

Sample Number	2246326-6		
Parameter	Noise (Leq 24 hrs.)		
Location	บริเวณรอบๆ 1 กิโลเมตร (N1) (GPS 47N 660892, 759222)		
Measurement Date	May 22 - May 23, 2022		
Measurement by	Yongsil Rangsee		
Sound Level meter	Serial No. 672670		
Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	65.2	94.5	41.6
10:00 AM - 11:00 AM	59.9	93.7	41.7
11:00 AM - 12:00 PM	50.5	76.1	44.0
12:00 PM - 01:00 PM	54.0	82.8	43.1
01:00 PM - 02:00 PM	56.6	82.4	39.0
02:00 PM - 03:00 PM	53.1	77.8	41.8
03:00 PM - 04:00 PM	54.4	86.4	42.4
04:00 PM - 05:00 PM	56.1	84.3	44.3
05:00 PM - 06:00 PM	57.1	88.3	42.9
06:00 PM - 07:00 PM	58.3	87.1	44.3
07:00 PM - 08:00 PM	51.0	75.7	39.0
08:00 PM - 09:00 PM	46.1	72.4	37.6
09:00 PM - 10:00 PM	47.5	76.3	41.5
10:00 PM - 11:00 PM	59.2	84.5	39.0
11:00 PM - 12:00 AM	47.7	73.6	38.0
12:00 AM - 01:00 AM	62.3	93.1	37.9
01:00 AM - 02:00 AM	45.0	70.6	36.9
02:00 AM - 03:00 AM	44.5	71.2	39.5
03:00 AM - 04:00 AM	50.5	72.6	39.4
04:00 AM - 05:00 AM	55.0	73.2	43.8
05:00 AM - 06:00 AM	63.0	95.1	44.3
06:00 AM - 07:00 AM	63.5	95.7	44.5
07:00 AM - 08:00 AM	52.8	78.3	42.1
08:00 AM - 09:00 AM	59.8	92.0	41.2
Leq Average 24 hrs. (dB(A))	58.2		
Lmax (dB(A))		95.7	
L90 (dB(A))			41.6
Ldn (dB(A))	65.3		
Standard (dB(A))	70	115	
Reference Method	ISO1996-1 and 1996-2		
Standard	1. ใช้มาตรฐานวิธีวัดและวิธีคำนวณตามข้อ 15 (พ.ศ. 2540) สำหรับมาตรฐานการวัดและวิธีคำนวณ 2. ใช้มาตรฐานวิธีวัดและวิธีคำนวณตามข้อ 15 (พ.ศ. 2540) สำหรับมาตรฐานการวัดและวิธีคำนวณ โดยกรม ม.ท. 2548		

Technical Management

Suanyee C.
Saranya Chalermtanong
Scientist (4)

Approved by

Supt S
Supt Salameh
Section Head

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12044-31/ENGL

3 Reports_Air Noise rpt (4.50PM)



Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : P0011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246326
Date Received : May 25, 2022
Date Reported : Jun 01, 2022
Report Number: 2331134-1

Page 1 of 1

Sample Number	2246326-7		
Parameter	Noise (Leq 24 hrs.)		
Location	บริเวณรอบๆ 1 กิโลเมตร (N1) (GPS 47N 660892, 759222)		
Measurement Date	May 23 - May 24, 2022		
Measurement by	Yongsil Rangsee		
Sound Level meter	Serial No. 672670		
Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	65.6	94.6	41.3
10:00 AM - 11:00 AM	57.3	89.4	39.9
11:00 AM - 12:00 PM	50.7	72.9	39.0
12:00 PM - 01:00 PM	53.7	79.6	39.1
01:00 PM - 02:00 PM	51.1	82.9	39.7
02:00 PM - 03:00 PM	58.1	88.2	39.3
03:00 PM - 04:00 PM	56.4	86.5	40.8
04:00 PM - 05:00 PM	53.4	77.6	42.5
05:00 PM - 06:00 PM	53.0	75.4	42.0
06:00 PM - 07:00 PM	46.1	71.3	41.6
07:00 PM - 08:00 PM	61.5	87.1	42.6
08:00 PM - 09:00 PM	56.8	85.3	44.5
09:00 PM - 10:00 PM	48.7	76.0	45.3
10:00 PM - 11:00 PM	49.1	75.5	44.7
11:00 PM - 12:00 AM	49.1	78.0	43.2
12:00 AM - 01:00 AM	52.4	68.3	46.5
01:00 AM - 02:00 AM	48.2	62.8	45.6
02:00 AM - 03:00 AM	46.2	60.6	46.4
03:00 AM - 04:00 AM	52.1	75.3	46.0
04:00 AM - 05:00 AM	54.8	77.8	43.9
05:00 AM - 06:00 AM	61.6	92.6	46.1
06:00 AM - 07:00 AM	60.6	90.3	44.5
07:00 AM - 08:00 AM	59.7	87.3	42.5
08:00 AM - 09:00 AM	59.5	85.4	43.7
Leq Average 24 hrs. (dB(A))	57.5		
Lmax (dB(A))		94.6	
L90 (dB(A))			42.5
Ldn (dB(A))	62.7		
Standard (dB(A))	70	115	
Reference Method	ISO1996-1 and 1996-2		
Standard	1. ใช้มาตรฐานวิธีวัดและวิธีคำนวณตามข้อ 15 (พ.ศ. 2540) สำหรับมาตรฐานการวัดและวิธีคำนวณ 2. ใช้มาตรฐานวิธีวัดและวิธีคำนวณตามข้อ 15 (พ.ศ. 2540) สำหรับมาตรฐานการวัดและวิธีคำนวณ โดยกรม ม.ท. 2548		

Technical Management

Suanyee C.
Saranya Chalermtanong
Scientist (4)

Approved by

Supt S
Supt Salameh
Section Head

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3 Reports_Air Noise rpt (4.50PM)



Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : P0011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246326
Date Received : May 25, 2022
Date Reported : Jun 01, 2022
Report Number: 2331133-1

Page 1 of 1

Sample Number	2246326-8		
Parameter	Noise (Leq 24 hrs.)		
Location	บริเวณรอบๆ 1 กิโลเมตร (N2) (GPS 47N 662200, 759079)		
Measurement Date	May 17 - May 18, 2022		
Measurement by	Yongsil Rangsee		
Sound Level meter	Serial No. 572573		
Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:00 AM - 09:00 AM	48.7	68.9	43.0
09:00 AM - 10:00 AM	48.7	73.8	42.2
10:00 AM - 11:00 AM	46.7	69.5	41.2
11:00 AM - 12:00 PM	45.4	67.2	40.2
12:00 PM - 01:00 PM	46.1	65.5	40.5
01:00 PM - 02:00 PM	47.2	68.9	41.9
02:00 PM - 03:00 PM	49.1	78.3	41.5
03:00 PM - 04:00 PM	52.8	77.2	42.6
04:00 PM - 05:00 PM	64.3	76.1	49.5
05:00 PM - 06:00 PM	55.2	74.4	49.6
06:00 PM - 07:00 PM	55.9	65.2	50.0
07:00 PM - 08:00 PM	63.6	68.8	57.5
08:00 PM - 09:00 PM	63.9	68.3	59.8
09:00 PM - 10:00 PM	61.6	67.5	58.0
10:00 PM - 11:00 PM	64.6	68.6	57.1
11:00 PM - 12:00 AM	60.4	65.0	54.1
12:00 AM - 01:00 AM	60.9	65.2	54.7
01:00 AM - 02:00 AM	60.2	64.6	55.0
02:00 AM - 03:00 AM	59.6	69.5	54.5
03:00 AM - 04:00 AM	63.9	69.4	56.8
04:00 AM - 05:00 AM	65.1	71.7	59.1
05:00 AM - 06:00 AM	65.2	72.7	61.0
06:00 AM - 07:00 AM	60.5	68.1	57.8
07:00 AM - 08:00 AM	56.8	70.6	54.8
Leq Average 24 hrs. (dB(A))	60.7		
Lmax (dB(A))		78.3	
L90 (dB(A))			54.1
Ldn (dB(A))	68.8		
Standard (dB(A))	70	115	
Reference Method	ISO1996-1 and 1996-2		
Standard	1. ใช้มาตรฐานวิธีวัดและวิธีคำนวณตามข้อ 15 (พ.ศ. 2540) สำหรับมาตรฐานการวัดและวิธีคำนวณ 2. ใช้มาตรฐานวิธีวัดและวิธีคำนวณตามข้อ 15 (พ.ศ. 2540) สำหรับมาตรฐานการวัดและวิธีคำนวณ โดยกรม ม.ท. 2548		

Technical Management

Suanyee C.
Saranya Chalermtanong
Scientist (4)

Approved by

Supt S
Supt Salameh
Section Head

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3 Reports_Air Noise rpt (5.00PM)



Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : P0011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246326
Date Received : May 25, 2022
Date Reported : Jun 01, 2022
Report Number: 2331134-1

Page 1 of 1

Sample Number	2246326-9		
Parameter	Noise (Leq 24 hrs.)		
Location	บริเวณรอบๆ 1 กิโลเมตร (N2) (GPS 47N 662200, 759079)		
Measurement Date	May 18 - May 19, 2022		
Measurement by	Yongsil Rangsee		
Sound Level meter	Serial No. 572573		
Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:00 AM - 09:00 AM	51.1	68.7	46.7
09:00 AM - 10:00 AM	50.7	74.2	44.3
10:00 AM - 11:00 AM	47.4	69.6	42.7
11:00 AM - 12:00 PM	45.8	64.5	41.8
12:00 PM - 01:00 PM	47.7	67.8	41.5
01:00 PM - 02:00 PM	48.6	69.1	42.0
02:00 PM - 03:00 PM	48.7	80.0	41.4
03:00 PM - 04:00 PM	48.1	72.8	42.6
04:00 PM - 05:00 PM	49.0	68.1	44.9
05:00 PM - 06:00 PM	51.8	75.6	46.1
06:00 PM - 07:00 PM	59.0	78.1	49.9
07:00 PM - 08:00 PM	65.6	69.9	61.6
08:00 PM - 09:00 PM	64.4	66.7	58.9
09:00 PM - 10:00 PM	65.3	66.9	56.1
10:00 PM - 11:00 PM	63.4	68.4	52.1
11:00 PM - 12:00 AM	63.5	70.5	52.7
12:00 AM - 01:00 AM	62.7	84.2	54.4
01:00 AM - 02:00 AM	58.4	63.8	55.1
02:00 AM - 03:00 AM	60.7	71.5	55.5
03:00 AM - 04:00 AM	63.0	71.3	56.9
04:00 AM - 05:00 AM	62.5	72.6	58.7
05:00 AM - 06:00 AM	66.7	74.3	59.6
06:00 AM - 07:00 AM	56.7	67.2	54.6
07:00 AM - 08:00 AM	53.0	66.6	47.6
Leq Average 24 hrs. (dB(A))	60.8		
Lmax (dB(A))		84.2	
L90 (dB(A))			49.9
Ldn (dB(A))	68.8		
Standard (dB(A))	70	115	
Reference Method	ISO1996-1 and 1996-2		
Standard	1. ใช้มาตรฐานวิธีวัดและวิธีคำนวณตามข้อ 15 (พ.ศ. 2540) สำหรับมาตรฐานการวัดและวิธีคำนวณ 2. ใช้มาตรฐานวิธีวัดและวิธีคำนวณตามข้อ 15 (พ.ศ. 2540) สำหรับมาตรฐานการวัดและวิธีคำนวณ โดยกรม ม.ท. 2548		

Technical Management

Suanyee C.
Saranya Chalermtanong
Scientist (4)

Approved by

Supt S
Supt Salameh
Section Head

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3 Reports_Air Noise rpt (5.00PM)



Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : P0011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246326
Date Received : May 25, 2022
Date Reported : Jun 01, 2022
Report Number: 2331137-1

Page 1 of 1

Sample Number : 2246326-10
Parameter : Noise (Leq 24 hrs.)
Location : บริเวณรอบๆพื้นที่อาคาร (N2) (GPS 47N 662200, 759079)
Measurement Date : May 19 - May 20, 2022
Measurement by : Yongsil Rangsee
Sound Level meter : Serial No. 572573

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:00 AM - 09:00 AM	48.1	71.5	43.3
09:00 AM - 10:00 AM	47.8	69.4	41.2
10:00 AM - 11:00 AM	48.9	76.8	42.6
11:00 AM - 12:00 PM	52.1	80.4	42.6
12:00 PM - 01:00 PM	50.4	78.4	41.6
01:00 PM - 02:00 PM	48.3	73.6	42.4
02:00 PM - 03:00 PM	48.7	68.9	43.0
03:00 PM - 04:00 PM	48.0	67.7	43.4
04:00 PM - 05:00 PM	48.7	69.8	44.3
05:00 PM - 06:00 PM	48.2	66.1	45.1
06:00 PM - 07:00 PM	51.9	69.6	46.6
07:00 PM - 08:00 PM	64.4	68.7	55.9
08:00 PM - 09:00 PM	65.3	68.7	60.8
09:00 PM - 10:00 PM	58.8	68.0	55.0
10:00 PM - 11:00 PM	65.5	69.2	61.4
11:00 PM - 12:00 AM	62.8	68.6	56.6
12:00 AM - 01:00 AM	61.6	67.7	56.8
01:00 AM - 02:00 AM	62.6	69.5	54.6
02:00 AM - 03:00 AM	63.1	69.1	56.8
03:00 AM - 04:00 AM	59.2	64.4	55.1
04:00 AM - 05:00 AM	61.1	65.8	56.1
05:00 AM - 06:00 AM	61.7	74.2	59.8
06:00 AM - 07:00 AM	58.9	67.1	55.3
07:00 AM - 08:00 AM	52.4	70.7	47.2

Leq Average 24 hrs. (dB(A)) : 59.9
Lmax (dB(A)) : 80.4
L90 (dB(A)) : 47.2
Ldn (dB(A)) : 66.2
Standard (dB(A)) : 70
Reference Method : ISO1996-1 and 1996-2

Standard : 1. มาตรฐานการกำหนดค่าเสียงรบกวนในอาคาร (ม.ร.ท. 2540) (สำหรับการกำหนดค่าเสียงรบกวนในอาคาร)
2. มาตรฐานการกำหนดค่าเสียงรบกวน (สำหรับการกำหนดค่าเสียงรบกวน) ตามมาตรฐานของกรมควบคุมมลพิษ
พ.ร.บ. ม.ร.ท. 2548

Technical Management

Sarany C.

Approved by

Supat S.

Saranya Chalermthamrong
Scientist (4)

Supat Salantheth
Section Head

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S:\Reports\Air Noise rpt (SOP)M



Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : P0011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246326
Date Received : May 25, 2022
Date Reported : Jun 01, 2022
Report Number: 2331138-1

Page 1 of 1

Sample Number : 2246326-11
Parameter : Noise (Leq 24 hrs.)
Location : บริเวณรอบๆพื้นที่อาคาร (N2) (GPS 47N 662200, 759079)
Measurement Date : May 20 - May 21, 2022
Measurement by : Yongsil Rangsee
Sound Level meter : Serial No. 572573

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:00 AM - 09:00 AM	48.9	68.6	43.5
09:00 AM - 10:00 AM	50.7	76.2	42.9
10:00 AM - 11:00 AM	47.0	67.2	43.5
11:00 AM - 12:00 PM	48.0	67.9	43.6
12:00 PM - 01:00 PM	47.0	62.6	43.9
01:00 PM - 02:00 PM	47.9	66.2	44.1
02:00 PM - 03:00 PM	49.0	69.0	43.5
03:00 PM - 04:00 PM	50.6	61.6	43.4
04:00 PM - 05:00 PM	49.8	69.5	46.1
05:00 PM - 06:00 PM	51.1	66.7	47.2
06:00 PM - 07:00 PM	59.1	68.1	51.1
07:00 PM - 08:00 PM	62.4	69.2	57.6
08:00 PM - 09:00 PM	64.8	69.4	59.6
09:00 PM - 10:00 PM	61.0	67.7	53.0
10:00 PM - 11:00 PM	53.6	64.8	51.2
11:00 PM - 12:00 AM	55.8	68.0	50.2
12:00 AM - 01:00 AM	58.3	66.5	51.2
01:00 AM - 02:00 AM	60.0	67.3	53.8
02:00 AM - 03:00 AM	61.6	69.4	55.6
03:00 AM - 04:00 AM	58.5	69.1	52.6
04:00 AM - 05:00 AM	60.5	70.8	54.2
05:00 AM - 06:00 AM	66.4	73.5	57.5
06:00 AM - 07:00 AM	57.7	69.6	52.4
07:00 AM - 08:00 AM	49.9	67.9	45.2

Leq Average 24 hrs. (dB(A)) : 58.8
Lmax (dB(A)) : 81.6
L90 (dB(A)) : 50.2
Ldn (dB(A)) : 66.7
Standard (dB(A)) : 70
Reference Method : ISO1996-1 and 1996-2

Standard : 1. มาตรฐานการกำหนดค่าเสียงรบกวนในอาคาร (ม.ร.ท. 2540) (สำหรับการกำหนดค่าเสียงรบกวนในอาคาร)
2. มาตรฐานการกำหนดค่าเสียงรบกวน (สำหรับการกำหนดค่าเสียงรบกวน) ตามมาตรฐานของกรมควบคุมมลพิษ
พ.ร.บ. ม.ร.ท. 2548

Technical Management

Sarany C.

Approved by

Supat S.

Saranya Chalermthamrong
Scientist (4)

Supat Salantheth
Section Head

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S:\Reports\Air Noise rpt (SOP)M



Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : P0011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246326
Date Received : May 25, 2022
Date Reported : Jun 01, 2022
Report Number: 2331139-1

Page 1 of 1

Sample Number : 2246326-12
Parameter : Noise (Leq 24 hrs.)
Location : บริเวณรอบๆพื้นที่อาคาร (N2) (GPS 47N 662200, 759079)
Measurement Date : May 21 - May 22, 2022
Measurement by : Yongsil Rangsee
Sound Level meter : Serial No. 572573

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:00 AM - 09:00 AM	49.1	71.0	41.6
09:00 AM - 10:00 AM	47.4	68.7	42.3
10:00 AM - 11:00 AM	48.1	68.5	43.6
11:00 AM - 12:00 PM	47.6	78.0	43.6
12:00 PM - 01:00 PM	48.6	72.3	43.9
01:00 PM - 02:00 PM	47.5	69.3	43.1
02:00 PM - 03:00 PM	48.7	68.1	44.3
03:00 PM - 04:00 PM	48.0	47.5	43.9
04:00 PM - 05:00 PM	48.0	66.8	45.1
05:00 PM - 06:00 PM	51.5	74.4	46.8
06:00 PM - 07:00 PM	56.4	67.5	53.4
07:00 PM - 08:00 PM	53.3	62.3	49.3
08:00 PM - 09:00 PM	60.8	68.0	50.4
09:00 PM - 10:00 PM	64.8	68.8	57.1
10:00 PM - 11:00 PM	64.2	68.2	54.8
11:00 PM - 12:00 AM	62.8	67.7	53.4
12:00 AM - 01:00 AM	61.8	68.6	50.2
01:00 AM - 02:00 AM	59.4	68.6	48.8
02:00 AM - 03:00 AM	62.2	68.3	55.4
03:00 AM - 04:00 AM	59.5	67.9	54.6
04:00 AM - 05:00 AM	59.5	63.5	55.0
05:00 AM - 06:00 AM	58.8	68.5	55.6
06:00 AM - 07:00 AM	55.7	66.7	52.5
07:00 AM - 08:00 AM	50.3	66.1	43.7

Leq Average 24 hrs. (dB(A)) : 58.6
Lmax (dB(A)) : 78.0
L90 (dB(A)) : 48.4
Ldn (dB(A)) : 67.0
Standard (dB(A)) : 70
Reference Method : ISO1996-1 and 1996-2

Standard : 1. มาตรฐานการกำหนดค่าเสียงรบกวนในอาคาร (ม.ร.ท. 2540) (สำหรับการกำหนดค่าเสียงรบกวนในอาคาร)
2. มาตรฐานการกำหนดค่าเสียงรบกวน (สำหรับการกำหนดค่าเสียงรบกวน) ตามมาตรฐานของกรมควบคุมมลพิษ
พ.ร.บ. ม.ร.ท. 2548

Technical Management

Sarany C.

Approved by

Supat S.

Saranya Chalermthamrong
Scientist (4)

Supat Salantheth
Section Head

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S:\Reports\Air Noise rpt (SOP)M



Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : P0011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246326
Date Received : May 25, 2022
Date Reported : Jun 01, 2022
Report Number: 2331140-1

Page 1 of 1

Sample Number : 2246326-13
Parameter : Noise (Leq 24 hrs.)
Location : บริเวณรอบๆพื้นที่อาคาร (N2) (GPS 47N 662200, 759079)
Measurement Date : May 22 - May 23, 2022
Measurement by : Yongsil Rangsee
Sound Level meter : Serial No. 572573

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:00 AM - 09:00 AM	45.9	67.9	41.1
09:00 AM - 10:00 AM	47.7	71.8	42.5
10:00 AM - 11:00 AM	47.4	71.5	43.8
11:00 AM - 12:00 PM	48.3	71.4	44.1
12:00 PM - 01:00 PM	48.3	69.2	43.7
01:00 PM - 02:00 PM	48.4	63.9	43.8
02:00 PM - 03:00 PM	48.1	70.7	43.7
03:00 PM - 04:00 PM	48.0	76.2	44.6
04:00 PM - 05:00 PM	48.9	69.2	45.1
05:00 PM - 06:00 PM	53.4	79.0	46.5
06:00 PM - 07:00 PM	53.8	62.2	47.5
07:00 PM - 08:00 PM	55.2	63.3	50.6
08:00 PM - 09:00 PM	53.5	61.1	50.7
09:00 PM - 10:00 PM	54.3	61.4	51.0
10:00 PM - 11:00 PM	54.1	64.4	50.1
11:00 PM - 12:00 AM	52.6	60.2	50.2
12:00 AM - 01:00 AM	50.5	58.0	47.9
01:00 AM - 02:00 AM	51.4	56.5	49.3
02:00 AM - 03:00 AM	54.4	59.6	51.6
03:00 AM - 04:00 AM	55.1	59.7	53.0
04:00 AM - 05:00 AM	55.8	61.9	53.4
05:00 AM - 06:00 AM	57.1	65.9	53.4
06:00 AM - 07:00 AM	57.9	75.1	49.6
07:00 AM - 08:00 AM	48.6	65.4	44.8

Leq Average 24 hrs. (dB(A)) : 52.9
Lmax (dB(A)) : 79.0
L90 (dB(A)) : 47.5
Ldn (dB(A)) : 61.0
Standard (dB(A)) : 70
Reference Method : ISO1996-1 and 1996-2

Standard : 1. มาตรฐานการกำหนดค่าเสียงรบกวนในอาคาร (ม.ร.ท. 2540) (สำหรับการกำหนดค่าเสียงรบกวนในอาคาร)
2. มาตรฐานการกำหนดค่าเสียงรบกวน (สำหรับการกำหนดค่าเสียงรบกวน) ตามมาตรฐานของกรมควบคุมมลพิษ
พ.ร.บ. ม.ร.ท. 2548

Technical Management

Sarany C.

Approved by

Supat S.

Saranya Chalermthamrong
Scientist (4)

Supat Salantheth
Section Head

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S:\Reports\Air Noise rpt (SOP)M



Analysis / Test Report

Client: AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : P001133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246326
Date Received : May 25, 2022
Date Reported : Jun 01, 2022
Report Number: 2331141-1

Page 1 of 1

Sample Number	2246326-14
Parameter	Noise (Leq 24 hrs.)
Location	พื้นที่บริเวณถนน/ซอย/คูน้ำ (H3) (GPS 47N 662209, 759079)
Measurement Date	May 23 - May 24, 2022
Measurement by	Yongsil Rangsee
Sound Level meter	Serial No. 572573

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:00 AM - 09:00 AM	50.0	72.6	43.1
09:00 AM - 10:00 AM	52.6	78.7	40.6
10:00 AM - 11:00 AM	45.2	62.5	42.1
11:00 AM - 12:00 PM	46.7	64.0	42.8
12:00 PM - 01:00 PM	45.7	65.0	42.1
01:00 PM - 02:00 PM	47.9	69.5	43.0
02:00 PM - 03:00 PM	48.0	67.3	42.4
03:00 PM - 04:00 PM	53.4	81.3	43.8
04:00 PM - 05:00 PM	47.3	65.2	44.4
05:00 PM - 06:00 PM	50.1	74.2	45.8
06:00 PM - 07:00 PM	53.2	74.0	48.0
07:00 PM - 08:00 PM	52.5	61.6	51.0
08:00 PM - 09:00 PM	52.5	58.7	50.8
09:00 PM - 10:00 PM	52.7	60.4	49.9
10:00 PM - 11:00 PM	54.4	60.3	51.1
11:00 PM - 12:00 AM	53.6	61.8	50.9
12:00 AM - 01:00 AM	53.5	59.6	49.9
01:00 AM - 02:00 AM	52.4	62.7	49.4
02:00 AM - 03:00 AM	50.8	59.4	49.2
03:00 AM - 04:00 AM	52.4	59.4	49.4
04:00 AM - 05:00 AM	55.1	64.1	51.9
05:00 AM - 06:00 AM	58.3	71.0	52.1
06:00 AM - 07:00 AM	51.6	70.7	49.7
07:00 AM - 08:00 AM	48.7	70.7	44.9
Leq Average 24 hrs. (dB(A))	52.3		
Lmax (dB(A))		81.3	
L90 (dB(A))			48.0
Ldn (dB(A))	60.2		
Standard (dB(A))	70	115	
Reference Method : ISO1996-1 and 1996-2			
Standard	1. ใช้ค่ามาตรฐานการวัดเสียงตามมาตรฐานฉบับที่ 15 (พ.ศ. 2540) เพื่อหาผลของการรบกวนเสียงในท้องถิ่น 2. ใช้วิธีการประเมินผลกระทบจากการรบกวนเสียงตามมาตรฐานฉบับที่ 15 (พ.ศ. 2540) เพื่อหาผลของการรบกวนเสียงในท้องถิ่น รายงาน ม.ร. 2548		

Technical Management

Saranyu C.

Saranyu Chaitumthong
Scientist (4)

Approved by

Supt S

Supt Salameh
Section Head

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Life Sciences

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12044-31/ EML

5 Vapour/Air Noise rpt (5.02P8)



Analysis / Test Report

Client: AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : P001133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246326
Date Received : May 25, 2022
Date Reported : Jun 01, 2022
Report Number: 2331142-1

Page 1 of 1

Sample Number	2246326-15
Parameter	Noise (Leq 24 hrs.)
Location	พื้นที่บริเวณถนน/ซอย/คูน้ำ (H3) (GPS 47N 716827, 738366)
Measurement Date	May 17 - May 18, 2022
Measurement by	Yongsil Rangsee
Sound Level meter	Serial No. 873118

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:00 AM - 09:00 AM	69.1	84.9	67.7
09:00 AM - 10:00 AM	67.8	79.9	66.9
10:00 AM - 11:00 AM	67.3	82.6	66.6
11:00 AM - 12:00 PM	66.6	80.9	65.6
12:00 PM - 01:00 PM	65.9	80.5	65.2
01:00 PM - 02:00 PM	65.9	83.8	65.0
02:00 PM - 03:00 PM	66.1	81.1	65.2
03:00 PM - 04:00 PM	66.9	90.5	65.4
04:00 PM - 05:00 PM	67.3	82.1	66.2
05:00 PM - 06:00 PM	66.8	80.2	66.3
06:00 PM - 07:00 PM	66.8	87.4	66.1
07:00 PM - 08:00 PM	66.6	79.9	66.3
08:00 PM - 09:00 PM	66.8	80.7	66.2
09:00 PM - 10:00 PM	66.5	71.7	66.3
10:00 PM - 11:00 PM	66.7	77.0	66.3
11:00 PM - 12:00 AM	67.0	92.1	66.3
12:00 AM - 01:00 AM	66.9	83.2	66.2
01:00 AM - 02:00 AM	66.4	70.6	66.1
02:00 AM - 03:00 AM	66.5	71.8	66.2
03:00 AM - 04:00 AM	66.5	70.7	66.2
04:00 AM - 05:00 AM	66.5	74.4	66.2
05:00 AM - 06:00 AM	66.8	85.7	66.3
06:00 AM - 07:00 AM	66.5	74.9	66.1
07:00 AM - 08:00 AM	66.4	72.8	66.1
Leq Average 24 hrs. (dB(A))	66.8		
Lmax (dB(A))		92.1	
L90 (dB(A))			66.2
Ldn (dB(A))	73.1		
Standard (dB(A))	70	115	
Reference Method : ISO1996-1 and 1996-2			
Standard	1. ใช้ค่ามาตรฐานการวัดเสียงตามมาตรฐานฉบับที่ 15 (พ.ศ. 2540) เพื่อหาผลของการรบกวนเสียงในท้องถิ่น 2. ใช้วิธีการประเมินผลกระทบจากการรบกวนเสียงตามมาตรฐานฉบับที่ 15 (พ.ศ. 2540) เพื่อหาผลของการรบกวนเสียงในท้องถิ่น รายงาน ม.ร. 2548		

Technical Management

Saranyu C.

Saranyu Chaitumthong
Scientist (4)

Approved by

Supt S

Supt Salameh
Section Head

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5 Vapour/Air Noise rpt (5.02P8)



Analysis / Test Report

Client: AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : P001133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246326
Date Received : May 25, 2022
Date Reported : Jun 01, 2022
Report Number: 2331143-1

Page 1 of 1

Sample Number	2246326-16
Parameter	Noise (Leq 24 hrs.)
Location	พื้นที่บริเวณถนน/ซอย/คูน้ำ (H3) (GPS 47N 716827, 738366)
Measurement Date	May 18 - May 19, 2022
Measurement by	Yongsil Rangsee
Sound Level meter	Serial No. 873118

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:00 AM - 09:00 AM	66.7	84.8	66.0
09:00 AM - 10:00 AM	66.5	81.2	65.9
10:00 AM - 11:00 AM	66.5	82.4	65.7
11:00 AM - 12:00 PM	66.9	80.3	65.7
12:00 PM - 01:00 PM	66.1	79.5	65.5
01:00 PM - 02:00 PM	65.8	77.2	65.3
02:00 PM - 03:00 PM	65.6	77.9	65.2
03:00 PM - 04:00 PM	65.9	81.6	65.3
04:00 PM - 05:00 PM	65.7	71.3	65.3
05:00 PM - 06:00 PM	66.0	71.6	65.6
06:00 PM - 07:00 PM	66.6	71.8	66.2
07:00 PM - 08:00 PM	66.3	74.5	65.9
08:00 PM - 09:00 PM	66.6	86.5	65.9
09:00 PM - 10:00 PM	66.4	83.5	65.9
10:00 PM - 11:00 PM	66.4	83.3	65.9
11:00 PM - 12:00 AM	66.2	74.7	65.8
12:00 AM - 01:00 AM	66.1	73.1	65.8
01:00 AM - 02:00 AM	66.2	82.0	65.6
02:00 AM - 03:00 AM	66.1	69.4	65.7
03:00 AM - 04:00 AM	66.3	70.0	65.9
04:00 AM - 05:00 AM	66.3	72.4	65.9
05:00 AM - 06:00 AM	66.4	71.3	65.9
06:00 AM - 07:00 AM	66.3	74.1	65.9
07:00 AM - 08:00 AM	67.3	96.3	65.8
Leq Average 24 hrs. (dB(A))	66.3		
Lmax (dB(A))		96.3	
L90 (dB(A))			65.8
Ldn (dB(A))	72.7		
Standard (dB(A))	70	115	
Reference Method : ISO1996-1 and 1996-2			
Standard	1. ใช้ค่ามาตรฐานการวัดเสียงตามมาตรฐานฉบับที่ 15 (พ.ศ. 2540) เพื่อหาผลของการรบกวนเสียงในท้องถิ่น 2. ใช้วิธีการประเมินผลกระทบจากการรบกวนเสียงตามมาตรฐานฉบับที่ 15 (พ.ศ. 2540) เพื่อหาผลของการรบกวนเสียงในท้องถิ่น รายงาน ม.ร. 2548		

Technical Management

Saranyu C.

Saranyu Chaitumthong
Scientist (4)

Approved by

Supt S

Supt Salameh
Section Head

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Life Sciences

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RIGHT SOLUTIONS

12044-31/ EML

5 Vapour/Air Noise rpt (5.02P8)



Analysis / Test Report

Client: AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : P001133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246326
Date Received : May 25, 2022
Date Reported : Jun 01, 2022
Report Number: 2331144-1

Page 1 of 1

Sample Number	2246326-17
Parameter	Noise (Leq 24 hrs.)
Location	พื้นที่บริเวณถนน/ซอย/คูน้ำ (H3) (GPS 47N 716827, 738366)
Measurement Date	May 19 - May 20, 2022
Measurement by	Yongsil Rangsee
Sound Level meter	Serial No. 873118

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:00 AM - 09:00 AM	66.8	89.1	65.6
09:00 AM - 10:00 AM	66.6	83.0	65.6
10:00 AM - 11:00 AM	66.0	77.3	65.3
11:00 AM - 12:00 PM	66.0	81.9	65.3
12:00 PM - 01:00 PM	66.2	82.4	65.5
01:00 PM - 02:00 PM	66.3	82.1	65.7
02:00 PM - 03:00 PM	66.2	80.7	65.7
03:00 PM - 04:00 PM	66.3	76.6	65.6
04:00 PM - 05:00 PM	66.2	81.4	65.6
05:00 PM - 06:00 PM	66.2	69.7	65.9
06:00 PM - 07:00 PM	66.5	76.9	66.1
07:00 PM - 08:00 PM	66.4	71.5	66.2
08:00 PM - 09:00 PM	66.9	71.1	66.6
09:00 PM - 10:00 PM	67.0	71.7	66.6
10:00 PM - 11:00 PM	67.0	72.4	66.7
11:00 PM - 12:00 AM	66.9	72.3	66.7
12:00 AM - 01:00 AM	67.0	73.9	66.7
01:00 AM - 02:00 AM	66.8	72.2	66.5
02:00 AM - 03:00 AM	66.8	73.7	66.3
03:00 AM - 04:00 AM	67.2	84.1	66.7
04:00 AM - 05:00 AM	67.2	78.5	66.7
05:00 AM - 06:00 AM	67.1	73.5	66.8
06:00 AM - 07:00 AM	67.1	79.2	66.7
07:00 AM - 08:00 AM	67.0	76.8	66.2
Leq Average 24 hrs. (dB(A))	66.7		
Lmax (dB(A))		89.1	
L90 (dB(A))			66.2
Ldn (dB(A))	73.4		
Standard (dB(A))	70	115	
Reference Method : ISO1996-1 and 1996-2			
Standard	1. ใช้ค่ามาตรฐานการวัดเสียงตามมาตรฐานฉบับที่ 15 (พ.ศ. 2540) เพื่อหาผลของการรบกวนเสียงในท้องถิ่น 2. ใช้วิธีการประเมินผลกระทบจากการรบกวนเสียงตามมาตรฐานฉบับที่ 15 (พ.ศ. 2540) เพื่อหาผลของการรบกวนเสียงในท้องถิ่น รายงาน ม.ร. 2548		

Technical Management

Saranyu C.

Saranyu Chaitumthong
Scientist (4)

Approved by

Supt S

Supt Salameh
Section Head

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RIGHT SOLUTIONS

12044-31/ EML

5 Vapour/Air Noise rpt (5.02P8)



Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : P001133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246326
Date Received : May 25, 2022
Date Reported : Jun 01, 2022
Report Number: 2331145-1

Page 1 of 1

Sample Number : 2246326-18
Parameter : Noise (Leq 24 hrs.)
Location : บริเวณพื้นที่โครงการ (Noise Survey) (N3) (GPS 47N 716827, 738366)
Measurement Date : May 20 - May 21, 2022
Measurement by : Yongsil Rangsee
Sound Level meter : Serial No. 873118

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:00 AM - 09:00 AM	66.5	73.4	66.0
09:00 AM - 10:00 AM	66.5	80.5	65.7
10:00 AM - 11:00 AM	67.1	81.9	65.5
11:00 AM - 12:00 PM	65.9	80.1	65.2
12:00 PM - 01:00 PM	66.1	80.9	65.3
01:00 PM - 02:00 PM	66.6	87.4	65.4
02:00 PM - 03:00 PM	66.9	72.0	65.6
03:00 PM - 04:00 PM	67.0	73.6	65.7
04:00 PM - 05:00 PM	66.4	78.1	65.9
05:00 PM - 06:00 PM	66.4	76.6	66.1
06:00 PM - 07:00 PM	66.3	76.8	65.9
07:00 PM - 08:00 PM	66.8	85.7	65.9
08:00 PM - 09:00 PM	66.4	70.2	66.1
09:00 PM - 10:00 PM	67.0	83.6	66.5
10:00 PM - 11:00 PM	66.6	72.4	66.2
11:00 PM - 12:00 AM	66.6	71.5	66.3
12:00 AM - 01:00 AM	66.9	78.6	66.4
01:00 AM - 02:00 AM	66.8	79.4	66.4
02:00 AM - 03:00 AM	66.5	70.7	66.1
03:00 AM - 04:00 AM	66.5	69.2	66.1
04:00 AM - 05:00 AM	66.9	73.4	66.5
05:00 AM - 06:00 AM	67.3	82.9	66.6
06:00 AM - 07:00 AM	67.4	86.0	66.6
07:00 AM - 08:00 AM	66.8	75.4	66.4

Leq Average 24 hrs. (dB(A)) : 66.7
Lmax (dB(A)) : 87.4
L90 (dB(A)) : 66.1
Ldn (dB(A)) : 73.2
Standard (dB(A)) : 70
Reference Method : ISO1996-1 and 1996-2

Standard : 1. มาตรฐานการกำหนดค่าระดับเสียงรบกวน 15 (พ.ศ. 2540) สำหรับแหล่งกำเนิดเสียงต่อเนื่อง
2. มาตรฐานการกำหนดค่าระดับเสียงรบกวน 15 (พ.ศ. 2540) สำหรับแหล่งกำเนิดเสียงไม่ต่อเนื่อง
หมายเหตุ : 1. ค่าที่ได้จากการคำนวณเป็นค่าเฉลี่ยของค่าที่ได้จากการวัดจริง
2. ค่าที่ได้จากการคำนวณเป็นค่าเฉลี่ยของค่าที่ได้จากการวัดจริง

Technical Management

Suanje C.
Saranya Chalermsamrong
Scientist (4)

Approved by

Supt S.
Supt Salanth
Section Head

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12044-31/ ENAIL

S Vaporn_Air Noise rpt (5.07PM)



Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : P001133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246326
Date Received : May 25, 2022
Date Reported : Jun 01, 2022
Report Number: 2331146-1

Page 1 of 1

Sample Number : 2246326-19
Parameter : Noise (Leq 24 hrs.)
Location : บริเวณพื้นที่โครงการ (Noise Survey) (N3) (GPS 47N 716827, 738366)
Measurement Date : May 21 - May 22, 2022
Measurement by : Yongsil Rangsee
Sound Level meter : Serial No. 873118

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:00 AM - 09:00 AM	66.5	81.3	65.7
09:00 AM - 10:00 AM	66.1	81.1	65.5
10:00 AM - 11:00 AM	66.0	80.6	65.4
11:00 AM - 12:00 PM	66.5	83.2	65.5
12:00 PM - 01:00 PM	65.9	77.8	65.5
01:00 PM - 02:00 PM	66.0	76.3	65.6
02:00 PM - 03:00 PM	66.1	85.4	65.3
03:00 PM - 04:00 PM	64.0	94.3	62.3
04:00 PM - 05:00 PM	63.1	70.4	62.7
05:00 PM - 06:00 PM	63.2	69.2	62.7
06:00 PM - 07:00 PM	65.2	83.2	63.9
07:00 PM - 08:00 PM	64.3	81.9	63.4
08:00 PM - 09:00 PM	63.9	77.6	63.2
09:00 PM - 10:00 PM	64.4	81.2	63.4
10:00 PM - 11:00 PM	63.8	75.3	63.4
11:00 PM - 12:00 AM	63.7	67.3	63.4
12:00 AM - 01:00 AM	63.6	68.8	63.2
01:00 AM - 02:00 AM	63.7	70.0	63.3
02:00 AM - 03:00 AM	63.6	66.9	63.3
03:00 AM - 04:00 AM	63.7	67.5	63.3
04:00 AM - 05:00 AM	64.1	70.9	63.5
05:00 AM - 06:00 AM	64.0	73.9	63.4
06:00 AM - 07:00 AM	63.8	72.2	63.2
07:00 AM - 08:00 AM	63.4	78.6	63.0

Leq Average 24 hrs. (dB(A)) : 64.7
Lmax (dB(A)) : 94.3
L90 (dB(A)) : 63.4
Ldn (dB(A)) : 70.4
Standard (dB(A)) : 70
Reference Method : ISO1996-1 and 1996-2

Standard : 1. มาตรฐานการกำหนดค่าระดับเสียงรบกวน 15 (พ.ศ. 2540) สำหรับแหล่งกำเนิดเสียงต่อเนื่อง
2. มาตรฐานการกำหนดค่าระดับเสียงรบกวน 15 (พ.ศ. 2540) สำหรับแหล่งกำเนิดเสียงไม่ต่อเนื่อง
หมายเหตุ : 1. ค่าที่ได้จากการคำนวณเป็นค่าเฉลี่ยของค่าที่ได้จากการวัดจริง
2. ค่าที่ได้จากการคำนวณเป็นค่าเฉลี่ยของค่าที่ได้จากการวัดจริง

Technical Management

Suanje C.
Saranya Chalermsamrong
Scientist (4)

Approved by

Supt S.
Supt Salanth
Section Head

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12044-31/ ENAIL

S Vaporn_Air Noise rpt (5.07PM)



Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : P001133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246326
Date Received : May 25, 2022
Date Reported : Jun 01, 2022
Report Number: 2331147-1

Page 1 of 1

Sample Number : 2246326-20
Parameter : Noise (Leq 24 hrs.)
Location : บริเวณพื้นที่โครงการ (Noise Survey) (N3) (GPS 47N 716827, 738366)
Measurement Date : May 22 - May 23, 2022
Measurement by : Yongsil Rangsee
Sound Level meter : Serial No. 873118

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:00 AM - 09:00 AM	63.3	82.6	62.4
09:00 AM - 10:00 AM	63.3	85.0	62.2
10:00 AM - 11:00 AM	62.8	77.7	62.0
11:00 AM - 12:00 PM	62.9	79.4	62.3
12:00 PM - 01:00 PM	63.1	78.2	62.7
01:00 PM - 02:00 PM	65.5	93.1	62.8
02:00 PM - 03:00 PM	66.7	83.3	65.5
03:00 PM - 04:00 PM	66.1	81.7	65.5
04:00 PM - 05:00 PM	66.1	79.1	65.6
05:00 PM - 06:00 PM	66.1	77.8	65.7
06:00 PM - 07:00 PM	66.6	83.5	66.0
07:00 PM - 08:00 PM	66.6	85.3	65.9
08:00 PM - 09:00 PM	66.3	70.2	66.0
09:00 PM - 10:00 PM	66.4	71.7	66.1
10:00 PM - 11:00 PM	66.7	71.6	66.3
11:00 PM - 12:00 AM	66.6	71.4	66.3
12:00 AM - 01:00 AM	66.6	72.2	66.2
01:00 AM - 02:00 AM	66.5	75.5	66.2
02:00 AM - 03:00 AM	67.0	70.4	66.3
03:00 AM - 04:00 AM	67.1	71.5	66.4
04:00 AM - 05:00 AM	66.9	71.3	66.5
05:00 AM - 06:00 AM	66.7	80.5	66.3
06:00 AM - 07:00 AM	66.6	74.0	66.3
07:00 AM - 08:00 AM	66.4	78.2	65.9

Leq Average 24 hrs. (dB(A)) : 66.0
Lmax (dB(A)) : 93.1
L90 (dB(A)) : 65.9
Ldn (dB(A)) : 73.0
Standard (dB(A)) : 70
Reference Method : ISO1996-1 and 1996-2

Standard : 1. มาตรฐานการกำหนดค่าระดับเสียงรบกวน 15 (พ.ศ. 2540) สำหรับแหล่งกำเนิดเสียงต่อเนื่อง
2. มาตรฐานการกำหนดค่าระดับเสียงรบกวน 15 (พ.ศ. 2540) สำหรับแหล่งกำเนิดเสียงไม่ต่อเนื่อง
หมายเหตุ : 1. ค่าที่ได้จากการคำนวณเป็นค่าเฉลี่ยของค่าที่ได้จากการวัดจริง
2. ค่าที่ได้จากการคำนวณเป็นค่าเฉลี่ยของค่าที่ได้จากการวัดจริง

Technical Management

Suanje C.
Saranya Chalermsamrong
Scientist (4)

Approved by

Supt S.
Supt Salanth
Section Head

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S Vaporn_Air Noise rpt (5.07PM)



Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : P001133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246326
Date Received : May 25, 2022
Date Reported : Jun 01, 2022
Report Number: 2331148-1

Page 1 of 1

Sample Number : 2246326-21
Parameter : Noise (Leq 24 hrs.)
Location : บริเวณพื้นที่โครงการ (Noise Survey) (N3) (GPS 47N 716827, 738366)
Measurement Date : May 23 - May 24, 2022
Measurement by : Yongsil Rangsee
Sound Level meter : Serial No. 873118

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:00 AM - 09:00 AM	66.3	79.9	65.9
09:00 AM - 10:00 AM	66.9	84.1	65.7
10:00 AM - 11:00 AM	66.5	79.6	65.3
11:00 AM - 12:00 PM	66.0	82.4	65.4
12:00 PM - 01:00 PM	66.3	80.8	65.5
01:00 PM - 02:00 PM	66.8	89.3	65.7
02:00 PM - 03:00 PM	66.0	76.8	65.6
03:00 PM - 04:00 PM	66.3	88.1	65.5
04:00 PM - 05:00 PM	66.2	80.7	65.5
05:00 PM - 06:00 PM	66.3	72.9	65.9
06:00 PM - 07:00 PM	67.1	70.0	66.6
07:00 PM - 08:00 PM	66.9	73.0	66.4
08:00 PM - 09:00 PM	66.7	76.2	66.4
09:00 PM - 10:00 PM	66.7	73.1	66.4
10:00 PM - 11:00 PM	66.6	74.3	66.3
11:00 PM - 12:00 AM	66.8	72.7	66.2
12:00 AM - 01:00 AM	66.5	72.7	66.2
01:00 AM - 02:00 AM	66.5	71.5	66.2
02:00 AM - 03:00 AM	66.6	71.5	66.1
03:00 AM - 04:00 AM	66.9	74.7	66.3
04:00 AM - 05:00 AM	67.2	73.2	66.7
05:00 AM - 06:00 AM	66.7	76.3	66.2
06:00 AM - 07:00 AM	66.8	75.2	66.3
07:00 AM - 08:00 AM	66.6	87.1	66.1

Leq Average 24 hrs. (dB(A)) : 66.6
Lmax (dB(A)) : 89.3
L90 (dB(A)) : 66.1
Ldn (dB(A)) : 73.1
Standard (dB(A)) : 70
Reference Method : ISO1996-1 and 1996-2

Standard : 1. มาตรฐานการกำหนดค่าระดับเสียงรบกวน 15 (พ.ศ. 2540) สำหรับแหล่งกำเนิดเสียงต่อเนื่อง
2. มาตรฐานการกำหนดค่าระดับเสียงรบกวน 15 (พ.ศ. 2540) สำหรับแหล่งกำเนิดเสียงไม่ต่อเนื่อง
หมายเหตุ : 1. ค่าที่ได้จากการคำนวณเป็นค่าเฉลี่ยของค่าที่ได้จากการวัดจริง
2. ค่าที่ได้จากการคำนวณเป็นค่าเฉลี่ยของค่าที่ได้จากการวัดจริง

Technical Management

Suanje C.
Saranya Chalermsamrong
Scientist (4)

Approved by

Supt S.
Supt Salanth
Section Head

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S Vaporn_Air Noise rpt (5.07PM)



Analysis / Test Report



TESTING
No.0166

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : PO011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2222865
Date Received : Feb 21, 2022
Date Reported : Mar 02, 2022
Report Number : 2237770-1 Rev. No.1

Page 1 of 1

Sample Number : 2222865-1
Sample Date : Feb 21, 2022 8:35 AM
Sample Description : Wastewater
Location : อ่างเก็บน้ำ
Date Analysis Commenced : Feb 22, 2022
Condition of Sample : Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 degree C)	mg/L	-	2	5	≤20	Based on APHA (2017), 5210 B	Songkhla
COD	mg/L	-	5	24	≤120	Based on APHA (2017), 5220 D	Songkhla
Formaldehyde *	mg/L	-	0.1	<0.1	≤1.0	Based on Wastewater Analysis	Songkhla
Oil & Grease	mg/L	-	3	<3	≤5	Based on APHA (2017), 5520 B	Songkhla
pH at 25 degree C	-	-	-	7.9	5.5-9.0	Based on APHA (2017), 4500-H (B)	Songkhla
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	118	≤3000	APHA (2017), 2540 C	Songkhla
Total Suspended Solids	mg/L	-	5	<5	≤50	APHA (2017), 2540 D	Songkhla

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2550 (2017).

Note : This Analysis test report is reissued to supersede report No.2237770-1, Date Reported : Mar 01, 2022 due to revise guideline/specification

Sampled By : Wuttichai Taucharoen, Wichaporn Romanant

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

Technical Management

Sutthirak Tiptat

Approved by

Kanitta H

Sutthirak Tiptat
Scientist (1)
หมายเลขโทรศัพท์ 267-47299

Kanitta Hemprasatporn
Supervisor
หมายเลขโทรศัพท์ 267-47296

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Analysis / Test Report



TESTING
No.0166

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : PO011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2222962
Date Received : Jun 21, 2022
Date Reported : Jun 29, 2022
Report Number : 2237943-1 Rev. No.1

Page 1 of 1

Sample Number : 2222962-1
Sample Date : Jun 21, 2022 2:10 PM
Sample Description : Wastewater
Location : อ่างเก็บน้ำ
Date Analysis Commenced : Jun 21, 2022
Condition of Sample : Contained in one amber glass bottle and three plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
BOD (5 days at 20 degree C)	mg/L	-	2	<2	≤20	Based on APHA (2017), 5210 B	Songkhla
COD	mg/L	-	5	15	≤120	Based on APHA (2017), 5220 D	Songkhla
Formaldehyde *	mg/L	-	0.1	0.5	≤1.0	Based on Wastewater Analysis	Songkhla
Oil & Grease	mg/L	-	3	<3	≤5	Based on APHA (2017), 5520 B	Songkhla
pH at 25 degree C	-	-	-	7.8	5.5-9.0	Based on APHA (2017), 4500-H (B)	Songkhla
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	89	≤3000	APHA (2017), 2540 C	Songkhla
Total Suspended Solids	mg/L	-	5	<5	≤50	APHA (2017), 2540 D	Songkhla

Guideline : Effluent standard for factories, industrial estate and industrial park set by Notification of the Ministry of Natural Resource and Environment and effluent standard for factories and industrial park set by Notification of The Ministry of Industry dated June 07, B.E.2550 (2017).

Sampled By : Woravut Deenuk

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

Technical Management

Sutthirak Tiptat

Approved by

Kanitta H

Sutthirak Tiptat
Scientist (2)
หมายเลขโทรศัพท์ 267-47299

Kanitta Hemprasatporn
Section Head
หมายเลขโทรศัพท์ 267-47296

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Analysis / Test Report



TESTING
No.0009

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : PO011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2227195
Date Received : Apr 20, 2022
Date Reported : Apr 27, 2022
Report Number : 2245972-1

Page 1 of 1

Sample Number : 2227195-1
Sample Date : Apr 20, 2022 10:20 AM
Sample Description : Surface Water
Location : แหล่งน้ำตามลำน้ำแม่ปรางค์เหนือตอนล่าง 200 เมตร (SW1)
Date Analysis Commenced : Apr 20, 2022
Condition of Sample : Contained in two BOD bottles and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Microbiological Testing								
Fecal Coliform	MPN/100mL	-	-	790.0	≤4000	No Standard	APHA (2017), 9221 E	Songkhla
Total Coliform	MPN/100mL	-	-	4900.0	≤20000	No Standard	APHA (2017), 9221 B	Songkhla
Water Testing								
Ammonia Nitrogen *	mg/L	-	0.06	<0.06	≤0.5	≤0.5	Based on APHA (2017), 4500-NH3 Bangkok (B), (F)	Songkhla
BOD (5 days at 20 degree C)	mg/L	-	2	<2	≤2	≤4	Based on APHA (2017), 5210 B	Songkhla
Chloride as Cl *	mg/L	0.06	0.2	10.2	No Standard	No Standard	Based on APHA (2017), 4110 B	Bangkok
Conductivity *	microhm/cm	-	0.5	96	No Standard	No Standard	Based on APHA (2017), 2510 B	Songkhla
Dissolved Oxygen *	mg/L	-	0.1	6.0	≥4	≥2	Based on APHA (2017), 4500-O (C)	Songkhla
pH at 25 degree C	-	-	-	7.0	5.0-9.0	5.0-9.0	Based on APHA (2017), 4500-H (B)	Songkhla
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	79	No Standard	No Standard	APHA (2017), 2540 C	Songkhla

Guideline : (1) Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act, B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 3)
(2) Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act, B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)

(a) Not Change from natural condition
(b) Non Objectable
(c) Change from Natural condition not more than 3 degree C

Sampled By : Somrak Junkong, Woravut Deenuk

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

Approved by

Sutthirak Tiptat

Sutthirak Tiptat
Scientist (1)

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Analysis / Test Report



TESTING
No.0166

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : PO011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2227195
Date Received : Apr 20, 2022
Date Reported : Apr 27, 2022
Report Number : 2245973-1

Page 1 of 1

Sample Number : 2227195-2
Sample Date : Apr 20, 2022 10:50 AM
Sample Description : Surface Water
Location : แหล่งน้ำตามลำน้ำแม่ปรางค์เหนือตอนล่าง 200 เมตร (SW2)
Date Analysis Commenced : Apr 20, 2022
Condition of Sample : Contained in two BOD bottles and four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline (1)	Guideline (2)	Method	Testing Location
Microbiological Testing								
Fecal Coliform	MPN/100mL	-	-	330.0	≤4000	No Standard	APHA (2017), 9221 E	Songkhla
Total Coliform	MPN/100mL	-	-	2200.0	≤20000	No Standard	APHA (2017), 9221 B	Songkhla
Water Testing								
Ammonia Nitrogen *	mg/L	-	0.06	<0.06	≤0.5	≤0.5	Based on APHA (2017), 4500-NH3 Bangkok (B), (F)	Songkhla
BOD (5 days at 20 degree C)	mg/L	-	2	<2	≤2	≤4	Based on APHA (2017), 5210 B	Songkhla
Chloride as Cl *	mg/L	0.06	0.2	10.3	No Standard	No Standard	Based on APHA (2017), 4110 B	Bangkok
Conductivity *	microhm/cm	-	0.5	97	No Standard	No Standard	Based on APHA (2017), 2510 B	Songkhla
Dissolved Oxygen *	mg/L	-	0.1	6.0	≥4	≥2	Based on APHA (2017), 4500-O (C)	Songkhla
pH at 25 degree C	-	-	-	7.0	5.0-9.0	5.0-9.0	Based on APHA (2017), 4500-H (B)	Songkhla
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	78	No Standard	No Standard	APHA (2017), 2540 C	Songkhla

Guideline : (1) Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act, B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 3)
(2) Notification of the National Environmental Board, No. 8, B.E.2537 issued under the Enhancement and Conservation of National Environmental Quality Act, B.E.2535, published in the Royal Government Gazette, Vol. 111, Part 16, Dated February 24, B.E. 2537 (Class 4)

(a) Not Change from natural condition
(b) Non Objectable
(c) Change from Natural condition not more than 3 degree C

Sampled By : Somrak Junkong, Woravut Deenuk

Remark :
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Approved by

Sutthirak Tiptat

Sutthirak Tiptat
Scientist (1)

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Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
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P/O : PO011133
Project Name : EIA Monitoring
Project Location :



TESTING
No.0166

Lot ID: 2227203
Date Received : May 10, 2022
Date Reported : May 18, 2022
Report Number : 2245989-1

Page 1 of 2

Sample Number : 2227203-1
Sampled Date : May 10, 2022 8:20 AM
Sample Description : Ground Water
Location : แปลงเกษตรกรรม/พื้นที่ว่างเปล่า (GW1)
Date Analysis Commenced : May 11, 2022
Condition of Sample : Contained in four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Arsenic	mg/L	0.001	0.005	Not Detected	≤0.05	Based on APHA (2017), 3125	Songkhla
Cadmium	mg/L	0.001	0.005	Not Detected	≤0.01	Based on APHA (2017), 3125	Songkhla
Chromium	mg/L	0.001	0.005	Not Detected	No Standard	Based on APHA (2017), 3125	Songkhla
Copper	mg/L	0.001	0.005	Not Detected	≤1.5	Based on APHA (2017), 3125	Songkhla
Iron	mg/L	0.001	0.005	0.05	≤1.0	Based on APHA (2017), 3125	Songkhla
Lead	mg/L	0.001	0.005	Not Detected	≤0.05	Based on APHA (2017), 3125	Songkhla
Mercury	mg/L	0.0003	0.0005	Not Detected	≤0.001	Based on APHA (2017), 3125	Songkhla
Zinc	mg/L	0.001	0.005	<0.005	≤15	Based on APHA (2017), 3125	Songkhla
Microbiological Testing							
Fecal Coliform	MPN/100mL	-	-	<1.8	No Standard	APHA (2017), 9221 E	Songkhla
Total Coliform	MPN/100mL	-	-	<1.8	<2.2 (1)	APHA (2017), 9221 B	Songkhla
Water Testing							
Chloride as Cl ⁻	mg/L	0.06	0.2	8.3	≤600	Based on APHA (2017), 4110 B	Bangkok
Sulfate *	mg/L	0.15	0.5	22.0	≤250	Based on APHA (2017), 4110 B	Bangkok
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	40	≤1200	APHA (2017), 2540 C	Songkhla
Total Hardness as CaCO ₃	mg/L	-	1	29	≤500	APHA (2017), 2340 C	Songkhla

Guideline : Groundwater Quality Standards for Drinking Purposes set by Notification of Ministry of Natural Resources and Environment B.E. 2551, Maximum allowable, (1) Suitable Allowance
Sampled By : Somrak Junkong, Woravut Deemak

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417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : PO011133
Project Name : EIA Monitoring
Project Location :



TESTING
No.0166

Lot ID: 2227203
Date Received : May 10, 2022
Date Reported : May 18, 2022
Report Number : 2245989-1

Page 2 of 2

Sample Number : 2227203-2
Sampled Date : May 10, 2022 8:30 AM
Sample Description : Ground Water
Location : แปลงเกษตรกรรม/พื้นที่ว่างเปล่า (GW2)
Date Analysis Commenced : May 11, 2022
Condition of Sample : Contained in four plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Metals Testing							
Arsenic	mg/L	0.001	0.005	Not Detected	≤0.05	Based on APHA (2017), 3125	Songkhla
Cadmium	mg/L	0.001	0.005	Not Detected	≤0.01	Based on APHA (2017), 3125	Songkhla
Chromium	mg/L	0.001	0.005	Not Detected	No Standard	Based on APHA (2017), 3125	Songkhla
Copper	mg/L	0.001	0.005	0.04	≤1.5	Based on APHA (2017), 3125	Songkhla
Iron	mg/L	0.001	0.005	0.04	≤1.0	Based on APHA (2017), 3125	Songkhla
Lead	mg/L	0.001	0.005	<0.005	≤0.05	Based on APHA (2017), 3125	Songkhla
Mercury	mg/L	0.0003	0.0005	Not Detected	≤0.001	Based on APHA (2017), 3125	Songkhla
Zinc	mg/L	0.001	0.005	0.03	≤15	Based on APHA (2017), 3125	Songkhla
Microbiological Testing							
Fecal Coliform	MPN/100mL	-	-	<1.8	No Standard	APHA (2017), 9221 E	Songkhla
Total Coliform	MPN/100mL	-	-	<1.8	<2.2 (1)	APHA (2017), 9221 B	Songkhla
Water Testing							
Chloride as Cl ⁻	mg/L	0.06	0.2	7.0	≤600	Based on APHA (2017), 4110 B	Bangkok
Sulfate *	mg/L	0.15	0.5	<0.5	≤250	Based on APHA (2017), 4110 B	Bangkok
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	19	≤1200	APHA (2017), 2540 C	Songkhla
Total Hardness as CaCO ₃	mg/L	-	1	10	≤500	APHA (2017), 2340 C	Songkhla

Guideline : Groundwater Quality Standards for Drinking Purposes set by Notification of Ministry of Natural Resources and Environment B.E. 2551, Maximum allowable, (1) Suitable Allowance
Sampled By : Somrak Junkong, Woravut Deemak

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Analysis / Test Report

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P/O : PO011133
Project Name : EIA Monitoring
Project Location :



TESTING
No.0009

Lot ID: 2227219
Date Received : Apr 21, 2022
Date Reported : Apr 27, 2022
Report Number : 2297661-1

Page 1 of 1

Sample Number : 2227219-1
Sampled Date : Apr 21, 2022 1:50 PM
Sample Description : Ground Water
Location : แปลงเกษตรกรรม/พื้นที่ว่างเปล่า
Date Analysis Commenced : Apr 23, 2022
Condition of Sample : Contained in two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
pH at 25 degree C	-	-	-	7.5	6.5-9.2 (1)	Based on APHA (2017), 4500-H (B)	Bangkok

Guideline : Notification of the Ministry of Industry B.E. 2559 (2016) on Soil and Groundwater Contamination Criteria, Monitoring of Soil and Groundwater Quality, Report Submission and Report Preparation of Soil and Groundwater Quality, and Proposal Report of Soil and Groundwater Controlling and Reduction Measures
(1) : Turned into a standard value for the analysis/checked sample(s) as indicated in the report. No part of this report or certificate may be reproduced in any form without written consent from the Laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

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Sampled By : Somrak Junkong, Woravut Deemak

Technical Management

Siriluk P.

Siriluk Puengpang
Supervisor

Approved by

Kanokorn Anek

Kanokorn Anek
Senior Manager

พนักงานอาวุโส 204-6-4720

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P/O : PO011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2227219
Date Received : Apr 21, 2022
Date Reported : Apr 28, 2022
Report Number : 2297661-2

Page 1 of 1

Sample Number : 2227219-1
Sampled Date : Apr 21, 2022 1:50 PM
Sample Description : Ground Water
Location : แปลงเกษตรกรรม/พื้นที่ว่างเปล่า
Date Analysis Commenced : Apr 23, 2022
Condition of Sample : Contained in two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing							
Formaldehyde	mg/L	-	0.1	<0.1	No Standard	Based on Wastewater Analysis	Songkhla
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	394	No Standard	Based on APHA (2017), 2540 C	Bangkok

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

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Approved by

Sutthirak Tiptat

Sutthirak Tiptat
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Analysis / Test Report



TESTING
No.0009

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : P0011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2227219
Date Received : Apr 21, 2022
Date Reported : Apr 27, 2022
Report Number : 2297662-1

Page 1 of 1

Sample Number : 2227219-2
Sampled Date : Apr 21, 2022 2:05 PM
Sample Description : Ground Water
Location : แปลงเกษตรในที่ดินหมายเลข 1
Date Analysis Commenced : Apr 23, 2022
Condition of Sample : Contained in two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing pH at 25 degree C	-	-	-	7.1	6.5-9.2 (I)	Based on APHA (2017), 4500-H (B)	Bangkok

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

Sampled By : Somsak Jirongk, Woravit Deemak

Remark :
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Technical Management

Siriluk P.

Siriluk Puengpiang
Supervisor
โทรศัพท์มือถือ : 09-204-4-4720

Approved by

Kanokkorn Anek

Kanokkorn Anek
Senior Manager
โทรศัพท์มือถือ : 09-204-4-6111

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P/O : P0011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2227219
Date Received : Apr 21, 2022
Date Reported : Apr 28, 2022
Report Number : 2297662-2

Page 1 of 1

Sample Number : 2227219-2
Sampled Date : Apr 21, 2022 2:05 PM
Sample Description : Ground Water
Location : แปลงเกษตรในที่ดินหมายเลข 1
Date Analysis Commenced : Apr 23, 2022
Condition of Sample : Contained in two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing Formaldehyde	mg/L	-	0.1	<0.1	No Standard	Based on Wastewater Analysis	Songkhla
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	412	No Standard	Based on APHA (2017), 2540 C	Bangkok

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

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

Approved by

Sutthirak T.

Sutthirak Tiprat
Scientist (1)

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12944-12 (BNAE)

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Analysis / Test Report



TESTING
No.0009

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : P0011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2227219
Date Received : Apr 21, 2022
Date Reported : Apr 27, 2022
Report Number : 2297663-1

Page 1 of 1

Sample Number : 2227219-3
Sampled Date : Apr 21, 2022 2:20 PM
Sample Description : Ground Water
Location : แปลงเกษตรในที่ดินหมายเลข 2
Date Analysis Commenced : Apr 23, 2022
Condition of Sample : Contained in two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing pH at 25 degree C	-	-	-	8.5	6.5-9.2 (I)	Based on APHA (2017), 4500-H (B)	Bangkok

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

Sampled By : Somsak Jirongk, Woravit Deemak

Remark :
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Technical Management

Siriluk P.

Siriluk Puengpiang
Supervisor
โทรศัพท์มือถือ : 09-204-4-4720

Approved by

Kanokkorn Anek

Kanokkorn Anek
Senior Manager
โทรศัพท์มือถือ : 09-204-4-6111

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12944-12 (BNAE)

5 (Page 1) of 1 (2.49H)



Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : P0011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2227219
Date Received : Apr 21, 2022
Date Reported : Apr 28, 2022
Report Number : 2297663-2

Page 1 of 1

Sample Number : 2227219-3
Sampled Date : Apr 21, 2022 2:20 PM
Sample Description : Ground Water
Location : แปลงเกษตรในที่ดินหมายเลข 2
Date Analysis Commenced : Apr 23, 2022
Condition of Sample : Contained in two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
Water Testing Formaldehyde	mg/L	-	0.1	<0.1	No Standard	Based on Wastewater Analysis	Songkhla
Total Dissolved Solids Dried at 180 degree C	mg/L	-	5	312	No Standard	Based on APHA (2017), 2540 C	Bangkok

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

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

Approved by

Sutthirak T.

Sutthirak Tiprat
Scientist (1)

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

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12944-12 (BNAE)

5 (Page 1) of 1 (2.49H)



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

Client : AICA Hatyai Co., Ltd.

Address : 417/115 Kamchanavanich Rd., Patong, Hatyai, Songkhla, Thailand, 90230

Project name : EIA Monitoring

รายงานผลการวิเคราะห์แหล่งกักต่อน้ำ

๑๖.๖.๖ ผลการวิเคราะห์แหล่งกักต่อน้ำ (เก็บตัวอย่างวันที่ 20 เมษายน 2565)

ชนิดแหล่งกักต่อน้ำ	ปริมาณแหล่งกักต่อน้ำ (หน่วยต่อลูกบาศก์เมตร)	
	2227209-1	2227209-2
Division Cyanophyta		
Class Cyanophyceae		
Order Nostocales		
Family Oscillatoriaceae		
1. <i>Oscillatoria</i> sp.	60,000	-
Division Chlorophyta		
Class Chlorophyceae		
Order Volvocales		
Family Volvocaceae		
2. <i>Eudorina elegans</i>	45,000	95,000
Order Chlorococcales		
Family Hydrodictyaceae		
3. <i>Pediastrum simplex</i>	-	11,000

๑๖.๖.๖ ผลการวิเคราะห์แหล่งกักต่อน้ำ (เก็บตัวอย่างวันที่ 20 เมษายน 2565)
(ต่อ)

ชนิดแหล่งกักต่อน้ำ	ปริมาณแหล่งกักต่อน้ำ (หน่วยต่อลูกบาศก์เมตร)	
	2227209-1	2227209-2
Family Oocystaceae		
4. <i>Dictyosphaerium pulchellum</i>	23,000	42,000
Family Scenedesmeceae		
5. <i>Scenedesmus armatus</i>	151,000	84,000
6. <i>Scenedesmus dimorphus</i>	-	53,000
7. <i>Scenedesmus opoliensis</i>	-	11,000
Order Zygomatales		
Family Desmidiaceae		
8. <i>Closterium gracile</i>	-	21,000
9. <i>Cosmarium nudum</i>	-	11,000
Class Euglenophyceae		
Order Euglenales		
Family Euglenaceae		
10. <i>Euglena acus</i>	15,000	-
11. <i>Euglena oxyuris</i>	8,000	-
12. <i>Euglena viridis</i>	8,000	-
13. <i>Lepocinclis ovum</i>	8,000	11,000
14. <i>Phacus angulatus</i>	53,000	-
15. <i>Phacus hamatus</i>	-	32,000
16. <i>Phacus helioides</i>	-	32,000
17. <i>Phacus tortus</i>	-	32,000
18. <i>Strombomonas australica</i>	8,000	21,000
19. <i>Strombomonas deflandrei</i>	8,000	-
20. <i>Strombomonas fluvialis</i>	-	11,000
21. <i>Strombomonas gibborosa</i>	-	32,000
22. <i>Strombomonas girardiana</i>	60,000	-
23. <i>Trachelomonas hispida</i>	121,000	-

๑๖.๖.๖ ผลการวิเคราะห์แหล่งกักต่อน้ำ (เก็บตัวอย่างวันที่ 20 เมษายน 2565)
(ต่อ)

ชนิดแหล่งกักต่อน้ำ	ปริมาณแหล่งกักต่อน้ำ (หน่วยต่อลูกบาศก์เมตร)	
	2227209-1	2227209-2
24. <i>Trachelomonas volzii</i>	15,000	-
Division Chromophyta		
Class Bacillariophyceae		
Order Bacillariales		
Suborder Fragilariineae		
Family Fragilariaceae		
25. <i>Fragilaria capucina</i>	-	64,000
26. <i>Synedra ulna</i>	91,000	126,000
Suborder Bacillariineae		
Family Eunotiaceae		
27. <i>Eunotia polyglophus</i>	8,000	-
Family Cymbellaceae		
28. <i>Gomphonema parvulum</i>	30,000	-
Family Naviculaceae		
29. <i>Diploneis bombus</i>	-	21,000
30. <i>Pinnularia gibba</i>	38,000	74,000
31. <i>Pinnularia grunowii</i>	-	21,000
Family Bacillariaceae		
32. <i>Nitzschia lorenziana</i>	-	32,000
33. <i>Nitzschia sigmoidea</i>	8,000	32,000
34. <i>Nitzschia</i> sp.	8,000	42,000
Family Surirellaceae		
35. <i>Surirella elegans</i>	76,000	32,000
36. <i>Surirella ovata</i>	-	21,000
37. <i>Surirella robusta</i>	68,000	168,000
38. <i>Surirella tenera</i>	8,000	42,000

๑๖.๖.๖ ผลการวิเคราะห์แหล่งกักต่อน้ำ (เก็บตัวอย่างวันที่ 20 เมษายน 2565)
(ต่อ)

ชนิดแหล่งกักต่อน้ำ	ปริมาณแหล่งกักต่อน้ำ (หน่วยต่อลูกบาศก์เมตร)	
	2227209-1	2227209-2
Class Chrysophyceae		
Order Synurales		
Family Mallomonadaceae		
39. <i>Mallomonas litorea</i>	-	21,000
Class Dinophyceae		
Order Peridinales		
Family Peridiniaceae		
40. <i>Peridinium ganense</i>	23,000	32,000
41. <i>Peridinium</i> sp.	23,000	-
ชนิดแหล่งกักต่อน้ำ	25	29
ปริมาณแหล่งกักต่อน้ำ	964,000	1,227,000
ดัชนีความหลากหลายแหล่งกักต่อน้ำ	2.7994	3.0832
ดัชนีความสม่ำเสมอแหล่งกักต่อน้ำ	0.8697	0.9156

Sample Location : 1. สถานี 2227209-1 : คลองอุโมงค์เก่าด้านซ้ายมือเมื่อเทียบกับที่ตั้งโครงการ 200 เมตร (SW1)
2. สถานี 2227209-2 : คลองอุโมงค์เก่าด้านซ้ายมือเมื่อเทียบกับที่ตั้งโครงการ 200 เมตร (SW2)

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

(นางสาวกานกรวณ ขาวดอน)
ผู้วิเคราะห์

(นายอลงกต อินทราชิต)
หัวหน้าสถานีวิทยุประมงศรีราชา



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

Client : AICA Hatyai Co., Ltd.

Address : 417/115 Kamchanavanich Rd., Patong, Hatyai, Songkhla, Thailand, 90230

Project name : EIA Monitoring

รายงานผลการวิเคราะห์แหล่งกอนสัตว์

01313 ผลการวิเคราะห์แหล่งกอนสัตว์ (เก็บตัวอย่างวันที่ 20 เมษายน 2565)

ชนิดแหล่งกอนสัตว์	ปริมาณแหล่งกอนสัตว์ (หน่วยต่อลูกบาศก์เมตร)	
	2227209-1	2227209-2
Phylum Protozoa		
Subphylum Plasmadroma		
Class Sarcodina		
Subclass Rhizopoda		
Order Testacida		
Family Arcellidae		
1. <i>Arcella vulgaris</i>	8,000	21,000
Family Euglyphidae		
2. <i>Euglypha acanthophora</i>	-	32,000
3. <i>Euglypha rotunda</i>	8,000	42,000
Subphylum Ciliophora		
Class Ciliata		
Subclass Holotricha		
Order Gymnostomatida		
4. <i>Didinium sp.</i>	8,000	-


01313 ผลการวิเคราะห์แหล่งกอนสัตว์ (เก็บตัวอย่างวันที่ 20 เมษายน 2565)

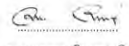
(ต่อ)

ชนิดแหล่งกอนสัตว์	ปริมาณแหล่งกอนสัตว์ (หน่วยต่อลูกบาศก์เมตร)	
	2227209-1	2227209-2
Subclass Spirotricha		
Order Heterotrichida		
5. <i>Spirostomum sp.</i>	8,000	-
Phylum Rotifera		
Class Monogononta		
Order Pleoima		
Family Brachionidae		
6. <i>Brachionus sp.</i>	8,000	-
Family Synchaetidae		
7. <i>Polyarthra vulgaris</i>	15,000	-
ชนิดแหล่งกอนสัตว์	6	3
ปริมาณแหล่งกอนสัตว์	55,000	95,000
ดัชนีความหลากหลายแหล่งกอนสัตว์	1.7564	1.0610
ดัชนีความสม่ำเสมอแหล่งกอนสัตว์	0.9803	0.9658

Sample Location : 1. สถานี 2227209-1 : คลองขุดเจาะด้านคันน้ำเมื่อเทียบกับที่ตั้งโครงการ 200 เมตร (SW1)
2. สถานี 2227209-2 : คลองขุดเจาะด้านท้ายน้ำเมื่อเทียบกับที่ตั้งโครงการ 200 เมตร (SW2)

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


(นางสาวกนกวรรณ ขาวค่อน)
ผู้วิเคราะห์


(นายอลงกล อินทราชิต)
หัวหน้าสถานีวิทยุประมงศรีราชา



สถานีวิทยุประมงศรีราชา
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อ. ศรีราชา จ. ชลบุรี 20110
โทร./โทรสาร. (038) 311379

Client : AICA Hatyai Co., Ltd.

Address : 417/115 Kamchanavanich Rd., Patong, Hatyai, Songkhla, Thailand, 90230

Project name : EIA Monitoring

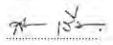
รายงานผลการวิเคราะห์สัตว์น้ำดิน


01313 ผลการวิเคราะห์สัตว์น้ำดิน (เก็บตัวอย่างวันที่ 20 เมษายน 2565)

ชนิดสัตว์น้ำดิน	ปริมาณสัตว์น้ำดิน (ตัว/ตารางเมตร)	
	2227213-1	2227213-2
Phylum Arthropoda		
Class Insecta		
Order Diptera		
Family Chironomidae		
<i>Chironomus sp.</i> (หนอนแดง)	30	15
รวมจำนวนสัตว์ทั้งหมด	1	1
รวมปริมาณทั้งหมด	30	15
ค่าดัชนีความหลากหลาย	0.0000	0.0000

Sample Location : 1. สถานี 2227213-1 : คลองขุดเจาะด้านคันน้ำเมื่อเทียบกับที่ตั้งโครงการ 200 เมตร (SW1)
2. สถานี 2227213-2 : คลองขุดเจาะด้านท้ายน้ำเมื่อเทียบกับที่ตั้งโครงการ 200 เมตร (SW2)

Condition of Sample : contained in one plastic zip bag


(นายสารวัณน์ เว็มศิริห์)
ผู้วิเคราะห์


(นายอลงกล อินทราชิต)
หัวหน้าสถานีวิทยุประมงศรีราชา



Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : PO011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2222859
Date Received : Mar 01, 2022
Date Reported : Mar 09, 2022
Report Number : 2237758-1 Rev. No.1
Page 1 of 5

Sample Number : 2222859-1
Sampled Date : Feb 28, 2022
Sample Description : Air Quality
Location : จวนสนามกีฬา
Date Analysis Commenced : Mar 03, 2022
Condition of Sample : Drawn into one sorbent tube, refrigerated
Barometric Pressure : 756 mmHg
Atmospheric Temperature : 30.0 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Formaldehyde	11:40 AM - 01:40 PM	ppm	-	0.1	<0.10	0.75	NIOSH (1994), 2541	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 resubmitted to supersede report No. 2237758-1 Date Reported : Mar 08, 2022 due to revise sample information

Sampled By : Aphat Chanta, Arth Srisen

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

Approved by


Saranya Chalerthamrong
Scientist (4)

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Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : PO01133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2222859
Date Received : Mar 01, 2022
Date Reported : Mar 09, 2022
Report Number : 2237758-1 Rev. No.1

Page 2 of 9

Sample Number : 2222859-2
Sampled Date : Feb 28, 2022
Sample Description : Air Quality
Location : สวนพฤกษศาสตร์เมืองปัตตานี
Date Analysis Commenced : Mar 03, 2022
Condition of Sample : Drawn into one sorbent tube, refrigerated
Barometric Pressure : 756 mmHg
Atmospheric Temperature : 30.0 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Formaldehyde	09:35 AM - 11:35 AM	ppm	-	0.1	<0.10	0.75	NIOSH (1994), 2541	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. 2237758-1 Date Reported : Mar 08, 2022 due to revise sample information

Sampled By : Apikwat Chanta, Artit Srisen

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

Approved by

Saranya C.

Saranya Chakraborty
Scientist (4)

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1204-111 (ENGL)



Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : PO01133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2222859
Date Received : Mar 01, 2022
Date Reported : Mar 09, 2022
Report Number : 2237758-1 Rev. No.1

Page 3 of 9

Sample Number : 2222859-3
Sampled Date : Feb 28, 2022
Sample Description : Air Quality
Location : สวนพฤกษศาสตร์เมืองปัตตานี
Date Analysis Commenced : Mar 03, 2022
Condition of Sample : Drawn into one sorbent tube, refrigerated
Barometric Pressure : 756 mmHg
Atmospheric Temperature : 30.0 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Methanol	09:25 AM - 11:25 AM	ppm	-	0.10	<0.10	200	NIOSH (1994), 2000	ACGDH	Bangkok

Guideline :
ACGDH : The American Conference of Governmental Industrial Hygiene, The 6th edition of the Documentation of the Threshold Limit Values and Biological Exposure Indices (2020)

Note : This Analysis test report is reissued to supersede report No. 2237758-1 Date Reported : Mar 08, 2022 due to revise sample information

Sampled By : Apikwat Chanta, Artit Srisen

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

Approved by

Saranya C.

Saranya Chakraborty
Scientist (4)

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1204-111 (ENGL)



Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : PO01133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2222859
Date Received : Mar 01, 2022
Date Reported : Mar 09, 2022
Report Number : 2237758-1 Rev. No.1

Page 4 of 9

Sample Number : 2222859-4
Sampled Date : Feb 28, 2022
Sample Description : Air Quality
Location : สวนพฤกษศาสตร์เมืองปัตตานี
Date Analysis Commenced : Mar 02, 2022
Condition of Sample : Drawn into one filter paper placed in plastic cassette and one 10-L air sampling bag
Barometric Pressure : 756 mmHg
Atmospheric Temperature : 30.0 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Total Dust	09:30 AM - 11:30 AM	mg/m ³	-	0.15	0.27	15	NIOSH (1994), 0500	OSHA	Songkhla
Total Hydrocarbon	09:30 AM - 11:30 AM	ppm	-	1.0	3.2	No Standard	Total Hydrocarbon Analyzer	-	Bangkok

Guideline :
OSHA : Occupational Safety and Health Administration

Note : This Analysis test report is reissued to supersede report No. 2237758-1 Date Reported : Mar 08, 2022 due to revise sample information

Sampled By : Apikwat Chanta, Artit Srisen

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

Approved by

Saranya C.

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1204-111 (ENGL)



Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : PO01133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2222859
Date Received : Mar 01, 2022
Date Reported : Mar 09, 2022
Report Number : 2237758-1 Rev. No.1

Page 5 of 9

Sample Number : 2222859-5
Sampled Date : Feb 28, 2022
Sample Description : Air Quality
Location : สวนพฤกษศาสตร์เมืองปัตตานี
Date Analysis Commenced : Mar 02, 2022
Condition of Sample : Drawn into one filter paper placed in plastic cassette and one 10-L air sampling bag
Barometric Pressure : 756 mmHg
Atmospheric Temperature : 30.0 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Total Dust	11:35 AM - 01:35 PM	mg/m ³	-	0.15	0.18	15	NIOSH (1994), 0500	OSHA	Songkhla
Total Hydrocarbon	11:35 AM - 01:35 PM	ppm	-	1.0	3.1	No Standard	Total Hydrocarbon Analyzer	-	Bangkok

Guideline :
OSHA : Occupational Safety and Health Administration

Note : This Analysis test report is reissued to supersede report No. 2237758-1 Date Reported : Mar 08, 2022 due to revise sample information

Sampled By : Apikwat Chanta, Artit Srisen

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

Approved by

Saranya C.

Saranya Chakraborty
Scientist (4)

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1204-111 (ENGL)



Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : PO011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246445
Date Received : May 11, 2022
Date Reported : May 21, 2022
Report Number : 2288513-1

Page 1 of 9

Sample Number : 2246445-1
Sampled Date : May 11, 2022
Sample Description : Air Quality
Location : เขตเทศบาลนครหาดใหญ่
Date Analysis Commenced : May 12, 2022
Condition of Sample : Drawn into one sorbent tube, refrigerated
Barometric Pressure : 756 mmHg
Atmospheric Temperature : 30.0 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Formaldehyde	09:25 AM - 11:25 AM	ppm	-	0.1	<0.10	0.75	NIOSH (1994), 2541	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 : Apivat Chanta, Warakorn Pookrak

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

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Sararat Mongkornjiravut
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Analysis / Test Report

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P/O : PO011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246445
Date Received : May 11, 2022
Date Reported : May 21, 2022
Report Number : 2288513-1

Page 2 of 9

Sample Number : 2246445-2
Sampled Date : May 11, 2022
Sample Description : Air Quality
Location : เขตเทศบาลนครหาดใหญ่
Date Analysis Commenced : May 12, 2022
Condition of Sample : Drawn into one sorbent tube, refrigerated
Barometric Pressure : 756 mmHg
Atmospheric Temperature : 30.0 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Formaldehyde	09:36 AM - 11:36 AM	ppm	-	0.1	<0.10	0.75	NIOSH (1994), 2541	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 : Apivat Chanta, Warakorn Pookrak

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

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P/O : PO011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246445
Date Received : May 11, 2022
Date Reported : May 21, 2022
Report Number : 2288513-1

Page 3 of 9

Sample Number : 2246445-3
Sampled Date : May 11, 2022
Sample Description : Air Quality
Location : เขตเทศบาลนครหาดใหญ่
Date Analysis Commenced : May 12, 2022
Condition of Sample : Drawn into one sorbent tube, refrigerated
Barometric Pressure : 756 mmHg
Atmospheric Temperature : 30.0 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Methanol	09:30 AM - 11:30 AM	ppm	-	0.10	<2.4	200	NIOSH (1994), 2000	ACGIH	Bangkok

Guideline :
ACGIH : The American Conference of Governmental Industrial Hygiene, The 6th edition of the Documentation of the Threshold Limit Values and Biological Exposure Indices (2020).

Sampled By : Apivat Chanta, Warakorn Pookrak

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

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P/O : PO011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246445
Date Received : May 11, 2022
Date Reported : May 21, 2022
Report Number : 2288513-1

Page 4 of 9

Sample Number : 2246445-4
Sampled Date : May 11, 2022
Sample Description : Air Quality
Location : เขตเทศบาลนครหาดใหญ่
Date Analysis Commenced : May 13, 2022
Condition of Sample : Drawn into one filter paper placed in plastic cassette and one 10-L air sampling bag
Barometric Pressure : 756 mmHg
Atmospheric Temperature : 30.0 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Total Dust	09:35 AM - 11:35 AM	mg/m3	-	0.15	<0.15	15	NIOSH (1994), 0500	OSHA	Songkhla
Total Hydrocarbon	09:35 AM - 11:35 AM	ppm	-	1.0	6.0	No Standard	Total Hydrocarbon Analyzer	-	Bangkok

Guideline :
OSHA : Occupational Safety and Health Administration
Sampled By : Apivat Chanta, Warakorn Pookrak

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

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Sararat Mongkornjiravut
Supervisor

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Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
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P/O : P001133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246445
Date Received : May 11, 2022
Date Reported : May 21, 2022
Report Number : 2288513-1

Page 5 of 9

Sample Number : 2246445-5
Sampled Date : May 11, 2022
Sample Description : Air Quality
Location : บริเวณพื้นที่ก่อสร้างโรงงาน
Date Analysis Commenced : May 13, 2022
Condition of Sample : Drawn into one filter paper placed in plastic cassette and one 10-L air sampling bag
Barometric Pressure : 756 mmHg
Atmospheric Temperature : 30.0 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Total Dust	09:05 AM - 11:05 AM	mg/m ³	-	0.15	<0.15	15	NIOSH (1994), 0500	OSHA	Songkhla
Total Hydrocarbon	09:05 AM - 11:05 AM	ppm	-	1.0	17.4	No Standard	Total Hydrocarbon Analyzer	-	Bangkok

Guideline :
OSHA : Occupational Safety and Health Administration
Sampled By : Apivat Chanta, Warakorn Pookrak

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

Approved by

Sararat Mongkonjirawat
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P/O : P001133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246445
Date Received : May 11, 2022
Date Reported : May 21, 2022
Report Number : 2288513-1

Page 6 of 9

Sample Number : 2246445-6
Sampled Date : May 11, 2022
Sample Description : Air Quality
Location : บริเวณพื้นที่ก่อสร้างโรงงาน
Date Analysis Commenced : May 12, 2022
Condition of Sample : Drawn into two sorbent tubes, refrigerated
Barometric Pressure : 756 mmHg
Atmospheric Temperature : 30.0 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Formaldehyde	09:40 AM - 11:40 AM	ppm	-	0.1	<0.10	0.75	NIOSH (1994), 2541	MOL	Bangkok
Methanol	09:40 AM - 11:40 AM	ppm	-	0.10	12.7	200	NIOSH (1994), 2000	ACGIH	Bangkok

Guideline :
ACGIH : The American Conference of Governmental Industrial Hygiene, The 6th edition of the Documentation of the Threshold Limit Values and Biological Exposure Indices (2020).
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 : Apivat Chanta, Warakorn Pookrak

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

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Sararat Mongkonjirawat
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P/O : P001133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246445
Date Received : May 11, 2022
Date Reported : May 21, 2022
Report Number : 2288513-1

Page 7 of 9

Sample Number : 2246445-7
Sampled Date : May 11, 2022
Sample Description : Air Quality
Location : บริเวณพื้นที่ก่อสร้างโรงงาน
Date Analysis Commenced : May 12, 2022
Condition of Sample : Drawn into one filter paper placed in plastic cassette, one 10-L air sampling bag and one sorbent tube, refrigerated
Barometric Pressure : 756 mmHg
Atmospheric Temperature : 30.0 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Methanol	09:10 AM - 11:10 AM	ppm	-	0.10	23.1	200	NIOSH (1994), 2000	ACGIH	Bangkok
Total Dust	09:10 AM - 11:10 AM	mg/m ³	-	0.15	<0.15	15	NIOSH (1994), 0500	OSHA	Songkhla
Total Hydrocarbon	09:10 AM - 11:10 AM	ppm	-	1.0	7.7	No Standard	Total Hydrocarbon Analyzer	-	Bangkok

Guideline :
ACGIH : The American Conference of Governmental Industrial Hygiene, The 6th edition of the Documentation of the Threshold Limit Values and Biological Exposure Indices (2020).
OSHA : Occupational Safety and Health Administration
Sampled By : Apivat Chanta, Warakorn Pookrak

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

Approved by

Sararat Mongkonjirawat
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P/O : P001133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246445
Date Received : May 11, 2022
Date Reported : May 21, 2022
Report Number : 2288513-1

Page 8 of 9

Sample Number : 2246445-8
Sampled Date : May 11, 2022
Sample Description : Air Quality
Location : บริเวณพื้นที่ก่อสร้างโรงงาน (1) บริเวณ
Khai Mahachulalongkornrajavidyalaya
Personal Sampling
Date Analysis Commenced : May 12, 2022
Condition of Sample : Drawn into one sorbent tube, refrigerated
Barometric Pressure : 756 mmHg
Atmospheric Temperature : 30.0 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Formaldehyde	08:30 AM - 10:30 AM	ppm	-	0.1	<0.10	0.75	NIOSH (1994), 2541	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 : Apivat Chanta, Warakorn Pookrak

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

Approved by

Sararat Mongkonjirawat
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Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : P0011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246445
Date Received : May 11, 2022
Date Reported : May 21, 2022
Report Number : 2288513-1

Page 5 of 9

Sample Number : 2246445-9
Sampled Date : May 11, 2022
Sample Description : Air Quality
Location : ห้องประชุมโรงงานผลิต (2) ฟาร์มไก่
Personal Sampling : ห้องประชุมโรงงานผลิต (ฟาร์มไก่)
Date Analysis Commenced : May 12, 2022
Condition of Sample : Drawn into one sorbent tube, refrigerated
Barometric Pressure : 756 mmHg
Atmospheric Temperature : 30.0 °C

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Formaldehyde	08:20 AM - 10:20 AM	ppm	-	0.1	<0.10	0.75	NIOSH (1994), 2541	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 : Aphaat Chaita, Warakorn Pookrak

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

Approved by

Saratat Mongkornjirawat
Supervisor

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Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : P0011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2239983
Date Received : Apr 23, 2022
Date Reported : Apr 28, 2022
Report Number : 2288889-1

Page 1 of 1

Sample Number : 2239983-1
Parameter : Noise (Leq 8 hrs.)
Location : อาคารโรงงานผลิต (Blower)
Measurement Date : Apr 21, 2022
Measurement by : Aris Sirsen

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:25 AM - 09:25 AM	73.6	79.6	73.1
09:25 AM - 10:25 AM	73.1	82.4	72.6
10:25 AM - 11:25 AM	72.1	89.8	71.6
11:25 AM - 12:25 PM	72.4	86.4	71.5
12:25 PM - 01:25 PM	72.5	80.0	71.8
01:25 PM - 02:25 PM	72.0	79.6	71.6
02:25 PM - 03:25 PM	73.6	84.2	72.0
03:25 PM - 04:25 PM	72.3	89.5	71.6

Leq Average 8 hrs. (dB(A)) : 72.7
Lmax (dB(A)) : 89.8
Standard (dB(A)) : 90
Reference Method : Based on ISO1996-1 and 1996-2
Standard : มาตรฐานการวัดระดับเสียง (วัดระดับเสียงตามมาตรฐานของกรมอนามัย)
มาตรฐานการวัดระดับเสียง (วัดระดับเสียงตามมาตรฐานของกรมอนามัย)

Technical Management

Suanyee C.
Saranya Chalerthamrong
Scientist (4)

Approved by

Sugot Salameh
Section Head

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S.Vijayalakshmi/Air Noise pt. (4.47PM)



Analysis / Test Report

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P/O : P0011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2239983
Date Received : Apr 23, 2022
Date Reported : May 17, 2022
Report Number : 2288516-1

Page 1 of 1

Sample Number : 2239983-2
Parameter : Noise (Leq 8 hrs.)
Location : อาคารโรงงานผลิต (ฟาร์มไก่)
Measurement Date : Apr 21, 2022
Measurement by : Aris Sirsen

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
08:30 AM - 09:30 AM	80.8	95.3	78.3
09:30 AM - 10:30 AM	87.3	107.1	80.8
10:30 AM - 11:30 AM	80.8	94.7	80.0
11:30 AM - 12:30 PM	85.4	106.5	80.8
12:30 PM - 01:30 PM	81.5	90.6	80.7
01:30 PM - 02:30 PM	81.2	89.9	80.5
02:30 PM - 03:30 PM	79.3	89.8	77.0
03:30 PM - 04:30 PM	80.1	95.6	77.5

Leq Average 8 hrs. (dB(A)) : 83.0
Lmax (dB(A)) : 107.1
Standard (dB(A)) : 90
Reference Method : Based on ISO1996-1 and 1996-2
Standard : มาตรฐานการวัดระดับเสียง (วัดระดับเสียงตามมาตรฐานของกรมอนามัย)
มาตรฐานการวัดระดับเสียง (วัดระดับเสียงตามมาตรฐานของกรมอนามัย)

Technical Management

Suanyee C.
Saranya Chalerthamrong
Scientist (4)

Approved by

Sugot Salameh
Section Head

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S.Vijayalakshmi/Air Noise pt. (4.47PM)



Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
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P/O : P0011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246446
Date Received : May 13, 2022
Date Reported : May 17, 2022
Report Number : 2288516-1

Page 1 of 2

Sample Number : 2246446-1
Sampled Date : May 11, 2022
Sample Description : Noise Dose
Location : อาคารโรงงานผลิต (1) ฟาร์มไก่
Personal Sampling : อาคารโรงงานผลิต (ฟาร์มไก่)
Date Analysis Commenced : May 13, 2022

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Noise Dose (8 hrs.)	08:20 AM - 04:20 PM	%	-	1	8.5	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Bangkok
TWA (8 hrs.)	08:20 AM - 04:20 PM	dB(A)	-	-	74.3	85	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Bangkok

Guideline :
MOL : 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. Notification of Department of Labour Protection and Welfare on the Standard of Time Weighted Average (TWA) Noise Level (B.E. 2561)
Sampled By : Warakorn Pookrak

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

Approved by

Wichan Choonhant
Assistant Manager

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417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : PO011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246446
Date Received : May 13, 2022
Date Reported : May 17, 2022
Report Number : 22889316-1

Page 2 of 2

Sample Number	2246446-2
Sampled Date	May 11, 2022
Sample Description	Noise Dose
Location	เสียง Production (2) เวร
Personal Sampling	การสุ่มตัวอย่างเสียง Production (2) เวร
Date Analysis Commenced	May 13, 2022

Analyte	Sampled Date/Time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
Air Testing									
Noise Dose (8 hrs.)	08:30 AM - 04:30 PM	%	-	1	17.8	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Bangkok
TWA (8 hrs.)	08:30 AM - 04:30 PM	dB(A)	-	-	77.5	85	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Bangkok

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. Notification of Department of Labour Protection and Welfare on the Standard of Time Weighted Average (TWA) Noise Level (B.E. 2561)

Remark :

- LOD : Limit of Detection
- "c" : Lower than LOQ (Limit of Quantization) / LOR (Limit of Reporting)

Approved by

Wichan Choonharat
Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : PO011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 222850
Date Received : Mar 02, 2022
Date Reported : Mar 08, 2022
Report Number: 2237730-1 Rev. No.1

Page 1 of 2

Sample Number	222850-1
Parameter	Heat Stress (Sampling Time : 10:00 AM - 12:00 PM)
Measurement Date	Feb 28, 2022
Measurement by	Artit Srisen
Location	ปฏิบัติงาน 1 ฟังก์ (สำนักงานอาคารปฏิบัติงาน : พนักงาน 1 มุม : Utility)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
บริเวณ Boiler	120	28.2	26.6	31.9	31.3
Average (WBGT)		28.2			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

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

Note:

2. This Analysis test report is issued to supersede report No. 2237730-1 Date Reported : Mar 04, 2022 due to revise sample information

Technical Management

Supot Salameh
Supot Salameh
Section Head

Approved by

Wichan Choonharat
Wichan Choonharat
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Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : PO011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 222850
Date Received : Mar 02, 2022
Date Reported : Mar 08, 2022
Report Number: 2237730-1 Rev. No.1

Page 2 of 2

Sample Number	222850-2
Parameter	Heat Stress (Sampling Time : 10:00 AM - 12:00 PM)
Measurement Date	Feb 28, 2022
Measurement by	Artit Srisen
Location	ปฏิบัติงาน 2 ฟังก์ (สำนักงานอาคารปฏิบัติงาน : พนักงาน 2 มุม : WH)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
บริเวณงานพัก Resin	60	27.3	25.7	31.1	30.7
Control Room	60	21.2	20.1	23.7	23.6
Average (WBGT)		24.3			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

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

Note:

2. This Analysis test report is issued to supersede report No. 2237730-1 Date Reported : Mar 04, 2022 due to revise sample information

Technical Management

Supot Salameh
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Section Head

Approved by

Wichan Choonharat
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Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : PO011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246328
Date Received : May 13, 2022
Date Reported : May 19, 2022
Report Number: 2288469-1 Rev. No.1

Page 1 of 2

Sample Number	2246328-1
Parameter	Heat Stress (Sampling Time : 10:20 AM - 12:20 PM)
Measurement Date	May 11, 2022
Measurement by	Warakorn Pookrak
Location	ปฏิบัติงาน 1 ฟังก์ (สำนักงานอาคารปฏิบัติงาน : พนักงาน 1 มุม : Resin)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
บริเวณงานพัก Resin	120	28.7	27.5	31.5	31.2
Average (WBGT)		28.7			
Guideline WBGT (°C)		30.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

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

Note:

- This Analysis test report is issued to supersede report No. 2288469-1, Date Reported : May 17, 2022 due to revise sample information.

Technical Management

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Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : P0011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246328
Date Received : May 13, 2022
Date Reported : May 19, 2022
Report Number: 2288469-1 Rev. No.1

Page 2 of 2

Sample Number	2246328-2
Parameter	Heat Stress (Sampling Time : 10:30 AM - 12:30 PM)
Measurement Date	May 11, 2022
Measurement by	Warakorn Pookrak
Location	บริเวณ 2 ชั้น (สำนักงาน ห้องประชุม : ห้อง 2 ชั้น : Maintenance)

Location	Duration (min)	WBGT (°C)	NWB (°C)	GT (°C)	DB (°C)
ภายใน	20	28.8	27.3	32.2	31.4
ภายนอก	100	29.1	27.6	32.5	32.2
Average (WBGT)		29.0			
Guideline WBGT (°C)		34.0			

Reference Method : Wet Bulb Globe Temperature

Guideline:

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

Note:

This Analysis test report is reissued to supersede report No. 2288469-1, Date Reported : May 17, 2022 due to revise sample information.

Technical Management

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Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : P0011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246438
Date Received : May 17, 2022
Date Reported : Jun 06, 2022
Report Number : 2334669-1

Page 1 of 1

Lay out No.	Reference Number	Measurement Date	Measurement Time	Spot /Area No.	Illuminance (Lux) Spot Average	Guideline Limit Spot/Min Average	Comment
1	2246438-1	11 May 2022	Day time	1	481	400-500	Pass
2	2246438-2	11 May 2022	Day time	1	465	400-500	Pass
3	2246438-3	11 May 2022	Day time	1	712	400-500	Pass
4	2246438-4	11 May 2022	Day time	1	477	400-500	Pass
5	2246438-5	11 May 2022	Day time	1	416	400-500	Pass
7	2246438-7	11 May 2022	Day time	1	403	400-500	Pass

Measurement by : Warakorn Pookrak Personnel of ALS Laboratory Group (Thailand) Co., Ltd.

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)

Note : This Analysis test report is reissued to supersede report No. 2320084-1, Date Reported : May 23, 2022 due to revise sample information.

Technical Management

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Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : P0011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246439
Date Received : May 17, 2022
Date Reported : Jun 06, 2022
Report Number : 2334666-1

Page 1 of 1

Lay out No.	Reference Number	Measurement Date	Measurement Time	Spot /Area No.	Illuminance (Lux) Spot Average	Guideline Limit Spot/Min Average	Comment
1	2246439-1	11 May 2022	Day time	1	409	400-500	Pass
2	2246439-2	11 May 2022	Day time	1	505	400-500	Pass
3	2246439-3	11 May 2022	Day time	1	410	400-500	Pass
7	2246439-6	11 May 2022	Day time	1	485	400-500	Pass
8	2246439-7	11 May 2022	Day time	1	550	400-500	Pass
9	2246439-8	11 May 2022	Day time	1	599	400-500	Pass
10	2246439-9	11 May 2022	Day time	1	1,825	400-500	Pass
10	2246439-10	11 May 2022	Day time	2	1,467	300	Pass
10	2246439-11	11 May 2022	Day time	3	960	200	Pass
11	2246439-12	11 May 2022	Day time	1	443	400-500	Pass

Measurement by : Warakorn Pookrak Personnel of ALS Laboratory Group (Thailand) Co., Ltd.

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)

Note : This Analysis test report is reissued to supersede report No. 2320086-1, Date Reported : May 23, 2022 due to revise sample information.

Technical Management

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Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : P0011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2222852
Date Received : Mar 03, 2022
Date Reported : Mar 04, 2022
Report Number : 2250703-1

Page 1 of 1

Lay out No.	Reference Number	Measurement Date	Measurement Time	Spot /Area No.	Illuminance (Lux) Spot Average	Guideline Limit Spot/Min Average	Comment
1	2222852-1	28 Feb 2022	Day time	1	475	400-500	Pass
2	2222852-2	28 Feb 2022	Day time	1	845	400-500	Pass
3	2222852-3	28 Feb 2022	Day time	1	502	400-500	Pass
4	2222852-4	28 Feb 2022	Day time	1	527	400-500	Pass
5	2222852-5	28 Feb 2022	Day time	1	431	400-500	Pass
6	2222852-6	28 Feb 2022	Day time	1	410	400-500	Pass
7	2222852-7	28 Feb 2022	Day time	1	421	400-500	Pass
8	2222852-8	28 Feb 2022	Day time	1	448	400-500	Pass

Measurement by : Aris Srisen Personnel of ALS Laboratory Group (Thailand) Co., Ltd.

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

Technical Management

Supot S.
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Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : PO011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2222853
Date Received : Mar 03, 2022
Date Reported : Mar 04, 2022
Report Number : 2250705-1

Page 1 of 1

Lay out No.	Reference Number	Measurement Date	Measurement Time	Spot / Area No.	Illuminance (Lux) Spot Average	Guideline Limit Spot/Min Average	Comment
1	Spot - อาคารศูนย์รวม : 3rd Floor : ห้อง Control Room : โต๊ะ 1	2222853-1	28 Feb 2022	Day time	1	402	Pass
2	Spot - อาคารศูนย์รวม : 3rd Floor : ห้อง Control Room : โต๊ะ 2	2222853-2	28 Feb 2022	Day time	1	594	Pass
3	Spot - อาคารศูนย์รวม : 3rd Floor : ห้อง Control Room : โต๊ะ 3	2222853-3	28 Feb 2022	Day time	1	844	Pass
4	Spot - อาคารศูนย์รวม : 3rd Floor : ห้อง Control Room : โต๊ะ 4	2222853-4	28 Feb 2022	Day time	1	470	Pass
5	Spot - อาคารศูนย์รวม : 3rd Floor : ห้อง Control Room : โต๊ะ 5	2222853-5	28 Feb 2022	Day time	1	438	Pass
7	Spot - อาคารศูนย์รวม : 3rd Floor : ห้อง Office Production : โต๊ะ 2	2222853-6	28 Feb 2022	Day time	1	520	Pass
8	Spot - อาคารศูนย์รวม : 3rd Floor : ห้อง Office Production : โต๊ะ 3	2222853-7	28 Feb 2022	Day time	1	914	Pass
9	Spot - อาคารศูนย์รวม : 3rd Floor : ห้อง Office Production : โต๊ะ 5	2222853-8	28 Feb 2022	Day time	1	616	Pass
10	Spot - อาคารศูนย์รวม : 3rd Floor : ห้อง Office Production : โต๊ะ 4	2222853-9	28 Feb 2022	Day time	1	2,239	Pass
10	2222853-10	28 Feb 2022	Day time	2	1,593	600	
10	2222853-11	28 Feb 2022	Day time	3	1,099	300	
11	Spot - อาคารศูนย์รวม : 3rd Floor : ห้อง Meeting Room : โต๊ะ 1	2222853-12	28 Feb 2022	Day time	1	404	Pass
12	Spot - อาคารศูนย์รวม : 3rd Floor : ห้อง Meeting Room : โต๊ะ 2	2222853-13	28 Feb 2022	Day time	1	401	Pass

Measurement by : Artit Srien Personnel of ALS Laboratory Group (Thailand) Co., Ltd.
Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

Technical Management

Supt S
Supt Salameh
Section Head

Approved by

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Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : PO011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2222854
Date Received : Mar 03, 2022
Date Reported : Mar 04, 2022
Report Number : 2255033-1

Page 1 of 2

Lay out No.	Reference Number	Measurement Date	Measurement Time	Spot / Area No.	Illuminance (Lux) Spot Average	Guideline Limit Spot/Min Average	Comment
1	Spot - อาคารศูนย์รวม : 1st Floor : โต๊ะ 1	2222854-1	28 Feb 2022	Day time	1	410	Pass
2	Spot - อาคารศูนย์รวม : 1st Floor : โต๊ะ 2	2222854-2	28 Feb 2022	Day time	1	531	Pass
3	Spot - อาคารศูนย์รวม : 1st Floor : โต๊ะ 3	2222854-3	28 Feb 2022	Day time	1	425	Pass
4	Spot - อาคารศูนย์รวม : 1st Floor : โต๊ะ 4	2222854-4	28 Feb 2022	Day time	1	646	Pass
5	Spot - อาคารศูนย์รวม : 1st Floor : โต๊ะ 5	2222854-5	28 Feb 2022	Day time	1	588	Pass
6	Spot - อาคารศูนย์รวม : 1st Floor : โต๊ะ 6	2222854-6	28 Feb 2022	Day time	1	635	Pass
7	Spot - อาคารศูนย์รวม : 1st Floor : โต๊ะ 7	2222854-7	28 Feb 2022	Day time	1	692	Pass
8	Spot - อาคารศูนย์รวม : 1st Floor : โต๊ะ 8	2222854-8	28 Feb 2022	Day time	1	720	Pass
9	Spot - อาคารศูนย์รวม : 1st Floor : โต๊ะ 9	2222854-9	28 Feb 2022	Day time	1	616	Pass
10	Spot - อาคารศูนย์รวม : 1st Floor : โต๊ะ 10	2222854-10	28 Feb 2022	Day time	1	499	Pass
11	Spot - อาคารศูนย์รวม : 1st Floor : โต๊ะ 11	2222854-11	28 Feb 2022	Day time	1	515	Pass
12	Spot - อาคารศูนย์รวม : 1st Floor : โต๊ะ 12	2222854-12	28 Feb 2022	Day time	1	574	Pass
13	Spot - อาคารศูนย์รวม : 1st Floor : โต๊ะ 13	2222854-13	28 Feb 2022	Day time	1	413	Pass
14	Spot - อาคารศูนย์รวม : 1st Floor : โต๊ะ 14	2222854-14	28 Feb 2022	Day time	1	621	Pass
15	Spot - อาคารศูนย์รวม : 1st Floor : โต๊ะ 17	2222854-15	28 Feb 2022	Day time	1	432	Pass
16	Spot - อาคารศูนย์รวม : 1st Floor : ห้อง Chief Accountant : โต๊ะ 15	2222854-16	28 Feb 2022	Day time	1	636	Pass
17	Spot - อาคารศูนย์รวม : 1st Floor : ห้อง HRD : โต๊ะ 16	2222854-17	28 Feb 2022	Day time	1	632	Pass

Technical Management

Supt S
Supt Salameh
Section Head

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Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : PO011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2222854
Date Received : Mar 03, 2022
Date Reported : Mar 04, 2022
Report Number : 2255033-1

Page 2 of 2

Lay out No.	Reference Number	Measurement Date	Measurement Time	Spot / Area No.	Illuminance (Lux) Spot Average	Guideline Limit Spot/Min Average	Comment
19	Spot - อาคารศูนย์รวม : 1st Floor : ห้อง Purchase : โต๊ะ 18	2222854-18	28 Feb 2022	Day time	1	612	Pass
20	Spot - อาคารศูนย์รวม : 1st Floor : โต๊ะ 21	2222854-19	28 Feb 2022	Day time	1	671	Pass
21	Spot - อาคารศูนย์รวม : 1st Floor : โต๊ะ 19	2222854-20	28 Feb 2022	Day time	1	824	Pass
22	Spot - อาคารศูนย์รวม : 1st Floor : ห้อง General Manager : โต๊ะ 1	2222854-21	28 Feb 2022	Day time	1	1,092	Pass
22	2222854-22	28 Feb 2022	Day time	2	1,075	300	
22	2222854-23	28 Feb 2022	Day time	3	850	200	
23	Spot - อาคารศูนย์รวม : 1st Floor : โต๊ะ 16	2222854-24	28 Feb 2022	Day time	1	759	Pass
24	Spot - อาคารศูนย์รวม : 1st Floor : โต๊ะ 20	2222854-25	28 Feb 2022	Day time	1	666	Pass

Measurement by : Artit Srien Personnel of ALS Laboratory Group (Thailand) Co., Ltd.
Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)
Note : This Analysis test report is reissued to supersede report No. 2250708-1 Date Reported : Mar 04, 2022 due to revise guideline/specification

Technical Management

Supt S
Supt Salameh
Section Head

Approved by

Wichan Ch
Wichan Choonharat
Assistant Manager

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5 (Report) of 10



Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : PO011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2222855
Date Received : Mar 03, 2022
Date Reported : Mar 04, 2022
Report Number : 2250710-1

Page 1 of 1

Lay out No.	Reference Number	Measurement Date	Measurement Time	Spot / Area No.	Illuminance (Lux) Spot Average	Guideline Limit Spot/Min Average	Comment
1	Spot - อาคารศูนย์รวม : 1st Floor : ห้อง Store : โต๊ะ 1	2222855-1	28 Feb 2022	Day time	1	435	Pass
2	Spot - อาคารศูนย์รวม : 1st Floor : ห้อง Store : โต๊ะ 2	2222855-2	28 Feb 2022	Day time	1	463	Pass
3	Spot - อาคารศูนย์รวม : 1st Floor : ห้อง Warehouse : โต๊ะ 1	2222855-3	28 Feb 2022	Day time	1	581	Pass

Measurement by : Artit Srien Personnel of ALS Laboratory Group (Thailand) Co., Ltd.
Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

Technical Management

Supt S
Supt Salameh
Section Head

Approved by

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Wichan Choonharat
Assistant Manager

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Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavach Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : PO011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 222856
Date Received : Mar 03, 2022
Date Reported : Mar 04, 2022
Report Number : 2250712-1

Page 1 of 1

Lay out No.	Reference Number	Measurement Date	Measurement Time	Spot /Area No.	Illuminance (Lux)		Guideline Limit		Comment
					Spot	Average	Spot/Min	Average	
1	Spot - อาคาร Maintenance : 1st Floor : ว่าง Office : ว่าง 1								
	222856-1	28 Feb 2022	Day time	1	439	-	400-500	-	Pass
2	Spot - อาคาร Maintenance : 1st Floor : ว่าง Office : ว่าง 2								
	222856-2	28 Feb 2022	Day time	1	461	-	400-500	-	Pass
3.1	Area - อาคาร Maintenance : 1st Floor : ว่างอาคาร Maintenance								
	222856-3	28 Feb 2022	Day time	1	379	394.0	150	300	Pass
3.2	Spot - อาคาร Maintenance : 1st Floor : ว่าง Office : ว่าง UT : ว่าง 1								
	222856-4	28 Feb 2022	Day time	2	409	-	-	-	Pass
4	Spot - อาคาร Maintenance : 1st Floor : ว่าง Office UT : ว่าง 1								
	222856-5	28 Feb 2022	Day time	1	830	-	400-500	-	Pass
6	Spot - อาคาร Maintenance : 1st Floor : ว่าง Office UT : ว่างอาคาร UT								
	222856-6	28 Feb 2022	Day time	1	570	-	400-500	-	Pass

Measurement by : Art. Srisen Personnel of ALS Laboratory Group (Thailand) Co., Ltd.
Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

Technical Management

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Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavach Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : PO011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246440
Date Received : May 17, 2022
Date Reported : Jun 06, 2022
Report Number : 2334746-1

Page 1 of 2

Lay out No.	Reference Number	Measurement Date	Measurement Time	Spot /Area No.	Illuminance (Lux) Spot	Average	Guideline Limit Spot/Min	Average	Comment
1	Spot - อาคารสำนักงาน : 1st Floor : ว่าง 1	2246440-1	11 May 2022	Day time	1	461	-	400-500	Pass
2	Spot - อาคารสำนักงาน : 1st Floor : ว่าง 2	2246440-2	11 May 2022	Day time	1	590	-	400-500	Pass
3	Spot - อาคารสำนักงาน : 1st Floor : ว่าง 3	2246440-3	11 May 2022	Day time	1	415	-	400-500	Pass
4	Spot - อาคารสำนักงาน : 1st Floor : ว่าง 4	2246440-4	11 May 2022	Day time	1	637	-	400-500	Pass
5	Spot - อาคารสำนักงาน : 1st Floor : ว่าง 5	2246440-5	11 May 2022	Day time	1	544	-	400-500	Pass
6	Spot - อาคารสำนักงาน : 1st Floor : ว่าง 6	2246440-6	11 May 2022	Day time	1	454	-	400-500	Pass
7	Spot - อาคารสำนักงาน : 1st Floor : ว่าง 7	2246440-7	11 May 2022	Day time	1	506	-	400-500	Pass
8	Spot - อาคารสำนักงาน : 1st Floor : ว่าง 8	2246440-8	11 May 2022	Day time	1	542	-	400-500	Pass
9	Spot - อาคารสำนักงาน : 1st Floor : ว่าง 9	2246440-9	11 May 2022	Day time	1	430	-	400-500	Pass
10	Spot - อาคารสำนักงาน : 1st Floor : ว่าง 10	2246440-10	11 May 2022	Day time	1	436	-	400-500	Pass
11	Spot - อาคารสำนักงาน : 1st Floor : ว่าง 11	2246440-11	11 May 2022	Day time	1	512	-	400-500	Pass
12	Spot - อาคารสำนักงาน : 1st Floor : ว่าง 12	2246440-12	11 May 2022	Day time	1	412	-	400-500	Pass
14	Spot - อาคารสำนักงาน : 1st Floor : ว่าง 14	2246440-14	11 May 2022	Day time	1	483	-	400-500	Pass
15	Spot - อาคารสำนักงาน : 1st Floor : ว่าง 17	2246440-15	11 May 2022	Day time	1	412	-	400-500	Pass
16	Spot - อาคารสำนักงาน : 1st Floor : ว่าง Chief Accountant : ว่าง 15	2246440-16	11 May 2022	Day time	1	834	-	400-500	Pass
17	Spot - อาคารสำนักงาน : 1st Floor : ว่าง HRD : ว่าง 16	2246440-17	11 May 2022	Day time	1	684	-	400-500	Pass
19	Spot - อาคารสำนักงาน : 1st Floor : ว่าง Purchase : ว่าง 18	2246440-18	11 May 2022	Day time	1	654	-	400-500	Pass

Technical Management

Supt S
Supt Salameh
Section Head

Approved by

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Assistant Manager

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Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavach Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : PO011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246440
Date Received : May 17, 2022
Date Reported : Jun 06, 2022
Report Number : 2334746-1

Page 2 of 2

Lay out No.	Reference Number	Measurement Date	Measurement Time	Spot /Area No.	Illuminance (Lux)	Spot	Average	Guideline Limit	Spot/Min	Average	Comment
20	Spot - อาคารสำนักงาน : 1st Floor : ว่าง 21	2246440-19	11 May 2022	Day time	1	656	-	400-500	-	-	Pass
21	Spot - อาคารสำนักงาน : 1st Floor : ว่าง 19	2246440-20	11 May 2022	Day time	1	501	-	400-500	-	-	Pass
22	Spot - อาคารสำนักงาน : 1st Floor : ว่าง General Manager : ว่าง 1	2246440-21	11 May 2022	Day time	1	1,324	-	400-500	-	-	Pass
22	2246440-22	11 May 2022	Day time	2	1,232	-	300	-	-	-	Pass
22	2246440-23	11 May 2022	Day time	3	861	-	200	-	-	-	Pass
23	Spot - อาคารสำนักงาน : 1st Floor : ว่าง 16	2246440-24	11 May 2022	Day time	1	617	-	400-500	-	-	Pass
24	Spot - อาคารสำนักงาน : 1st Floor : ว่าง 20	2246440-25	11 May 2022	Day time	1	621	-	400-500	-	-	Pass

Measurement by : Warakorn Pookrak Personnel of ALS Laboratory Group (Thailand) Co., Ltd.
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)
Note : This Analysis test report is released to supervise report No. 232008-1, Date Reported : May 23, 2022, due to revise sample information

Technical Management

Supt S
Supt Salameh
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Assistant Manager

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Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavach Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : PO011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246441
Date Received : May 17, 2022
Date Reported : May 23, 2022
Report Number : 2320090-1

Page 1 of 1

Lay out No.	Reference Number	Measurement Date	Measurement Time	Spot /Area No.	Illuminance (Lux)	Guideline Limit	Comment	
					Spot Average	Spot/Min Average		
1	Spot - อาคารบำรุงรักษา : 1st Floor : ว่าง Store : ว่าง 1	2246441-1	11 May 2022	Day time	1	447	400-500	Pass
2	Spot - อาคารบำรุงรักษา : 1st Floor : ว่าง Store : ว่าง 2	2246441-2	11 May 2022	Day time	1	423	400-500	Pass
3	Spot - อาคารบำรุงรักษา : 1st Floor : ว่าง Warehouse : ว่าง 1	2246441-3	11 May 2022	Day time	1	729	400-500	Pass

Measurement by : Warakorn Pookrak Personnel of ALS Laboratory Group (Thailand) Co., Ltd.
Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

Technical Management

Supt S
Supt Salameh
Section Head

Approved by

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Assistant Manager

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Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O : PO011133
Project Name : EIA Monitoring
Project Location :

Lot ID: 2246442
Date Received : May 17, 2022
Date Reported : May 23, 2022
Report Number : 2320092-1

Page 1 of 1										
Lay out No.	Reference Number	Measurement Date	Measurement Time	Spot /Area No.	Illuminance (Lux) Spot Average	Guideline Limit Spot/Min Average		Comment		
1	Spot - อาคาร Maintenance : 1st Floor : via Office : 1	2246442-1	11 May 2022	Day time	1	408	-	400-500	Pass	
2	Spot - อาคาร Maintenance : 1st Floor : via Office : 2	2246442-2	11 May 2022	Day time	1	415	-	400-500	Pass	
3.1	Area - อาคาร Maintenance : 1st Floor : via Office : Maintenance	2246442-3	11 May 2022	Day time	1	342	364.0	150	300	Pass
3.2	Area - อาคาร Maintenance : 1st Floor : via Office : Maintenance	2246442-4	11 May 2022	Day time	2	386	-	-	-	-
4	Spot - อาคาร Maintenance : 1st Floor : via Office UT : 1	2246442-5	11 May 2022	Day time	1	685	-	400-500	Pass	
6	Spot - อาคาร Maintenance : 1st Floor : via Office UT : 1	2246442-6	11 May 2022	Day time	1	1,109	-	400-500	Pass	
6	Spot - อาคาร Maintenance : 1st Floor : via Office UT : 1	2246442-7	11 May 2022	Day time	2	911	-	300	-	-
6	Spot - อาคาร Maintenance : 1st Floor : via Office UT : 1	2246442-8	11 May 2022	Day time	3	631	-	200	-	-

Measurement by : Warakorn Pookrak Personnel of ALS Laboratory Group (Thailand) Co., Ltd.
Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 390 dated February 21 B.E.2561 (2018)

Technical Management

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Supot Salameh
Section Head

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Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O :
Project Name : EIA Monitoring
Project Location :

Lot ID: 2276326
Date Received : Jun 24, 2022
Date Reported : Jul 05, 2022
Report Number : 2350153-1

Lay out No.	Reference Number	Measurement Date	Measurement Time	Spot /Area No.	Illuminance (Lux)		Guideline Limit		Comment
					Spot	Average	Spot/Min	Average	
6	Spot - อาคาร Maintenance : 2nd Floor : via HSE&QC : 1	2276326-1	21 Jun 2022	Day time	1	752	-	400-500	Pass
8	Spot - อาคาร Maintenance : 2nd Floor : via HSE&QC : 1	2276326-2	21 Jun 2022	Day time	1	812	-	400-500	Pass

Measurement by : Anit Srisen Personnel of ALS Laboratory Group (Thailand) Co., Ltd.
Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 390 dated February 21 B.E.2561 (2018)

Technical Management

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Analysis / Test Report

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417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O :
Project Name : EIA Monitoring
Project Location :

Lot ID: 2276331
Date Received : Jun 24, 2022
Date Reported : Jul 05, 2022
Report Number : 2350164-1

Lay out No.	Reference Number	Measurement Date	Measurement Time	Spot /Area No.	Illuminance (Lux)		Guideline Limit		Comment
					Spot	Average	Spot/Min	Average	
4	Spot - อาคาร Maintenance : 3rd Floor : via Control Room : 1	2276331-1	21 Jun 2022	Day time	1	634	-	400-500	Pass
5	Spot - อาคาร Maintenance : 3rd Floor : via Control Room : 1	2276331-2	21 Jun 2022	Day time	1	580	-	400-500	Pass

Measurement by : Anit Srisen Personnel of ALS Laboratory Group (Thailand) Co., Ltd.
Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 390 dated February 21 B.E.2561 (2018)

Technical Management

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Analysis / Test Report

Client : AICA Hatyai Co., Ltd.
417/115, Kamchanavanich Rd., Patong, Hatyai, Songkhla Thailand 90230
P/O :
Project Name : EIA Monitoring
Project Location :

Lot ID: 2276332
Date Received : Jun 24, 2022
Date Reported : Jul 05, 2022
Report Number : 2350161-1

Lay out No.	Reference Number	Measurement Date	Measurement Time	Spot /Area No.	Illuminance (Lux)		Guideline Limit		Comment
					Spot	Average	Spot/Min	Average	
13	Spot - อาคาร Maintenance : 1st Floor : 13	2276332-1	21 Jun 2022	Day time	1	526	-	400-500	Pass

Measurement by : Anit Srisen Personnel of ALS Laboratory Group (Thailand) Co., Ltd.
Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 390 dated February 21 B.E.2561 (2018)

Technical Management

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ใบรับรองการสอบเทียบเครื่องมือ



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รายการเครื่องมือที่ใช้ในการวิเคราะห์ /ทดสอบ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Ambient	Nitrogen Dioxide	NO ₂ Analyzer	SGK_F50094	4-Jan-22	4-Jul-22	6
Ambient	Nitrogen Dioxide	NO ₂ Analyzer	BKK_F50764	4-Jan-22	4-Jul-22	6
Ambient	Nitrogen Dioxide	NO ₂ Analyzer	SGK_F50092	4-Jan-22	4-Jul-22	6
Ambient	Nitrogen Dioxide	NO ₂ Analyzer	BKK_F51084	4-Jan-22	4-Jul-22	6
Noise	Leq 24 hrs	Sound Calibrator	SGK_F50111	9-Aug-21	9-Aug-22	12
Noise	Leq 24 hrs	Sound Level Meter	SGK_F50023	20-Oct-21	20-Oct-22	12
Noise	Leq 24 hrs	Sound Level Meter	SGK_F50022	20-Oct-21	20-Oct-22	12
Noise	Leq 24 hrs	Sound Level Meter	SGK_F50026	20-Oct-21	20-Oct-22	12
Workplace	Formaldehyde	Field Rotameter	BKK_F51023	5-Jan-22	5-Apr-22	3
Workplace	Formaldehyde	Field Rotameter	BKK_F50577	1-Apr-22	1-Jul-22	3
Workplace	Formaldehyde	QC-FID	BKK_EN0126	21-Oct-21	21-Apr-23	18
Workplace	Methanol	Field Rotameter	BKK_F51023	5-Jan-22	5-Apr-22	3
Workplace	Methanol	Field Rotameter	BKK_F50577	1-Apr-22	1-Jul-22	3
Workplace	Methanol	QC-FID	BKK_EN0126	21-Oct-21	21-Apr-23	18
Workplace	Total Dust	Field Rotameter	BKK_F51025	5-Jan-22	5-Apr-22	3
Workplace	Total Dust	Field Rotameter	BKK_F50581	1-Apr-22	1-Jul-22	3
Workplace	Total Dust	Analytical Balance 5D	SGK_CL0077	9-Nov-21	9-Nov-22	12
Workplace	Total Hydrocarbon	Field Rotameter	BKK_F51023	5-Jan-22	5-Apr-22	3
Workplace	Total Hydrocarbon	Total Hydrocarbon Analyzer	BKK_EN0057	9-Feb-21	9-Aug-22	18
Heat	Heat Stress	Heat Stress Monitor	SGK_F50008	15-Aug-21	15-Aug-22	12
Heat	Heat Stress	Heat Stress Monitor	SGK_F50044	14-Oct-21	14-Oct-22	12
Heat	Heat Stress	Heat Stress Monitor	SGK_F50009	17-Aug-21	17-Aug-22	12
Heat	Heat Stress	Heat Stress Monitor	SGK_F50041	12-Oct-21	12-Oct-22	12
Illuminance	Illuminance	Lux Meter	SGK_F50012	14-Sep-21	14-Sep-22	12
Illuminance	Illuminance	Lux Meter	SGK_F50012	14-Sep-21	14-Sep-22	12
Illuminance	Illuminance	Lux Meter	SGK_F50012	14-Sep-21	14-Sep-22	12
Noise	Leq 8 hrs	Sound Calibrator	PHK_F50011	9-Aug-21	9-Aug-22	12
Noise	Leq 8 hrs	Sound Level Meter	PHK_F50017	16-Sep-21	16-Sep-22	12
Noise	Leq 8 hrs	Sound Level Meter	SRT_F50010	16-Sep-21	16-Sep-22	12
Noise	Noise Dose TWA	Dose Badge Reader	SGK_F50006	24-Jan-22	24-Jan-23	12
Songkhla Lab	BOD (5 days at 20 °C)	Incubator	SGK_CL0026	11-Feb-21	12-Aug-22	18
Songkhla Lab	BOD (5 days at 20 °C)	DORBO Analyzer	SGK_CL0073	2-Dec-21	2-Dec-22	12
Songkhla Lab	COD	PTG10/22004	SGK_F50008	8-Feb-22	8-Feb-23	12
Songkhla Lab	COD	Spectrophotometer	SGK_CL0038	24-Jan-22	24-Jan-23	12
Songkhla Lab	Formaldehyde	Spectrophotometer	SGK_CL0040	24-Jan-22	24-Jan-23	12
Songkhla Lab	Formaldehyde	Cold Room Water	SGK_CL0085	15-Aug-21	14-Feb-23	18
Songkhla Lab	pH at 25 °C	pH meter	SGK_CL0030	9-Nov-21	10-May-23	18
Songkhla Lab	Total Dissolved Solids 180 °C	Electronic Top-Loading Balance	SGK_CL0045	5-Feb-22	5-Feb-23	12
Songkhla Lab	Total Dissolved Solids 180 °C	Oven	SGK_CL0024	9-Nov-21	10-May-23	18
Songkhla Lab	Total Suspended Solids	Electronic Top-Loading Balance	SGK_CL0045	5-Feb-22	5-Feb-23	12
Songkhla Lab	Total Suspended Solids	Oven	SGK_CL0024	9-Nov-21	10-May-23	18
Songkhla Lab	Oil & Grease	Electronic Top-Loading Balance	SGK_CL0045	5-Feb-22	5-Feb-23	12
Songkhla Lab	Oil & Grease	Oven	SGK_CL0024	9-Nov-21	10-May-23	18
Songkhla Lab	Oil & Grease	Water Bath	SGK_CL0036	5-Feb-22	6-Aug-23	18
Water Lab	Ammonia Nitrogen	Discrete analyzer	BKK_F50037	28-Jun-22	28-Jun-23	12
Water Lab	Chloride	Ion Chromatography	BKK_EN0089	12-Jan-22	12-Jan-23	12
Songkhla Lab	Conductivity	Conductivity Meter	SGK_CL0032	15-May-21	15-May-22	12
Songkhla Lab	Total Coliform	Autoclave	SGK_M0001	5-Jul-21	3-Jan-23	18
Songkhla Lab	Total Coliform	Incubator	SGK_M0013	8-Feb-21	8-Aug-22	18
Songkhla Lab	Total Coliform	pH Meter	SGK_M0016	5-Jul-21	3-Jan-23	18
Songkhla Lab	Total Coliform	Water Bath	SGK_M0021	8-Aug-21	4-Feb-23	18
Songkhla Lab	Fecal Coliform	Autoclave	SGK_M0001	5-Jul-21	3-Jan-23	18
Songkhla Lab	Fecal Coliform	Incubator	SGK_M0013	8-Feb-21	8-Aug-22	18
Songkhla Lab	Fecal Coliform	pH Meter	SGK_M0016	5-Jul-21	3-Jan-23	18
Songkhla Lab	Fecal Coliform	Water Bath	SGK_M0021	8-Aug-21	4-Feb-23	18

Right Solutions - Right Partner

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ALS Laboratory Group (Thailand) Co., Ltd.
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Khaewang Phatthakanan, Khet Suan Luang,
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รายการเครื่องมือที่ใช้ในการวิเคราะห์ /ทดสอบ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Songkhla Lab	Arsenic	ICP-MS	SGK_CL0048	8-Feb-22	8-Feb-23	12
Songkhla Lab	Arsenic	Cold Room Water	SGK_CL0085	16-Aug-21	14-Feb-23	18
Songkhla Lab	Cadmium	ICP-MS	SGK_CL0048	8-Feb-22	8-Feb-23	12
Songkhla Lab	Cadmium	Cold Room Water	SGK_CL0085	16-Aug-21	14-Feb-23	18
Songkhla Lab	Chromium	ICP-MS	SGK_CL0048	8-Feb-22	8-Feb-23	12
Songkhla Lab	Chromium	Cold Room Water	SGK_CL0085	16-Aug-21	14-Feb-23	18
Songkhla Lab	Copper	ICP-MS	SGK_CL0048	8-Feb-22	8-Feb-23	12
Songkhla Lab	Copper	Cold Room Water	SGK_CL0085	16-Aug-21	14-Feb-23	18
Songkhla Lab	Iron	ICP-MS	SGK_CL0048	8-Feb-22	8-Feb-23	12
Songkhla Lab	Iron	Cold Room Water	SGK_CL0085	16-Aug-21	14-Feb-23	18
Songkhla Lab	Lead	ICP-MS	SGK_CL0048	8-Feb-22	8-Feb-23	12
Songkhla Lab	Lead	Cold Room Water	SGK_CL0085	16-Aug-21	14-Feb-23	18
Songkhla Lab	Zinc	ICP-MS	SGK_CL0048	8-Feb-22	8-Feb-23	12
Songkhla Lab	Zinc	Cold Room Water	SGK_CL0085	16-Aug-21	14-Feb-23	18
Songkhla Lab	Mercury	ICP-MS	SGK_CL0048	8-Feb-22	8-Feb-23	12
Songkhla Lab	Mercury	Cold Room Water	SGK_CL0085	16-Aug-21	14-Feb-23	18
Water Lab	Sulfate	Ion Chromatography	BKK_EN0089	12-Jan-22	12-Jan-23	12

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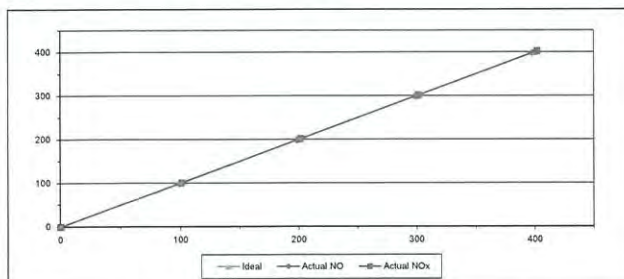
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MULTIPOINT CALIBRATION REPORT

Calibration Date	4-Jan-22	Equipment Name	NOx Analyzer
Manufacturer	HORIBA	Model	APNA-370
Serial No.	NK6RT3TF	Equipment ID	SGK_F50094
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947	Cylinder No.	LL38633
Std. Gas Concentration (PPM)	51.33	Certified By	Airgas Inc.
Cylinder Pressure (psi)	1200	Expired Date	18-Mar-22
Certified Date	18-Mar-14		

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	99.10	-0.90	-0.90	100.90	0.90	0.90
2	200.00	198.50	-1.50	-0.75	201.40	1.40	0.70
3	300.00	298.50	-1.50	-0.50	301.50	1.50	0.50
4	400.00	398.20	-1.80	-0.45	402.10	2.10	0.53
AVERAGE (%)				-0.50			0.55



Calibrated By

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

Approved By

(Mr.Sarayuht Jilbrant)
Assistant General Manager

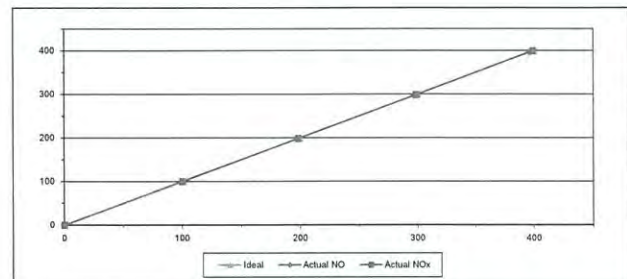
ALS Laboratory Group
FORM NO. F-06-056 REVISION NO. 1 ISSUE DATE 02/04/12



MULTIPOINT CALIBRATION REPORT

Calibration Date	4-Jan-22	Equipment Name	NOx Analyzer
Manufacturer	HORIBA	Model	APNA-370
Serial No.	R0A0GWJC	Equipment ID	BKK_F80784
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	947	Cylinder No.	LL38633
Std. Gas Concentration (PPM)	51.33	Certified By	Airgas Inc.
Cylinder Pressure (psi)	1200	Expired Date	18-Mar-22
Certified Date	18-Mar-14		

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	198.20	-1.80	-0.90	198.60	-1.40	-0.70
3	300.00	297.50	-2.50	-0.83	298.70	-1.30	-0.43
4	400.00	396.70	-3.30	-0.83	399.10	-0.90	-0.22
AVERAGE (%)				-0.81			-0.21



Calibrated By

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

Approved By

(Mr.Sarayuht Jilbrant)
Assistant General Manager

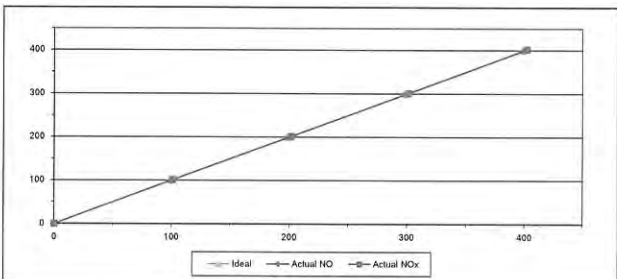
ALS Laboratory Group
FORM NO. F-06-056 REVISION NO. 1 ISSUE DATE 02/04/12



MULTIPOINT CALIBRATION REPORT

Calibration Date	4-Jan-22	Equipment Name	NOx Analyzer
Manufacturer	HORIBA	Model	APNA-370
Serial No.	WNBGLLL	Equipment ID	SGK_FS0082
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	847		
Std. Gas Concentration (PPM)	51.33	Cylinder No.	LL36833
Cylinder Pressure (psi)	1200	Certified By	Airgas Inc.
Certified Date	18-Mar-14	Expired Date	18-Mar-22

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	99.10	-0.90	-0.90	101.10	1.10	1.10
2	200.00	198.50	-1.50	-0.75	201.30	1.30	0.65
3	300.00	298.50	-1.50	-0.50	301.40	1.40	0.47
4	400.00	398.20	-1.80	-0.45	402.00	2.00	0.50
AVERAGE (%)				-0.50			0.56



Calibrated By

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

Approved By

(Mr. Sarayuth Jitranont)
Assistant General Manager

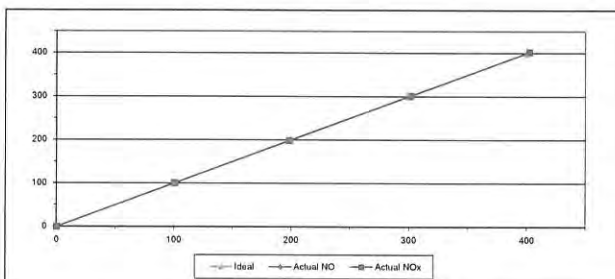
ALS Laboratory Group
FORM NO. F-06-056 REVISION NO. - ISSUE DATE: 02/04/12



MULTIPOINT CALIBRATION REPORT

Calibration Date	4-Jan-22	Equipment Name	NOx Analyzer
Manufacturer	HORIBA	Model	APNA-370
Serial No.	WJ3877NG	Equipment ID	BKK_FS1084
Calibrator Manufacturer	Teledyne API	Model	700
Serial No.	847		
Std. Gas Concentration (PPM)	51.33	Cylinder No.	LL36833
Cylinder Pressure (psi)	1200	Certified By	Airgas Inc.
Certified Date	18-Mar-14	Expired Date	18-Mar-22

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	100.10	0.10	0.10	100.70	0.70	0.70
2	200.00	198.50	-1.50	-0.75	198.30	-1.70	-0.85
3	300.00	301.70	1.70	0.57	301.60	1.60	0.53
4	400.00	401.60	1.60	0.40	402.10	2.10	0.53
AVERAGE (%)				0.08			0.20



Calibrated By

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

Approved By

(Mr. Sarayuth Jitranont)
Assistant General Manager

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

SITHIPORN ASSOCIATES CO., LTD.
CALIBRATION LABORATORY

451-451/1 Sirinthorn Rd, Bangbunru, Bangplud Bangkok 10700 THAILAND
Tel:0-2435-8800 Fax:0-2433-1679 e-mail:center@sithiporn.com http://www.sithiporn.com



Cert. No. : ACC21011
Pages : 1 of 3

Calibration Certificate

Equipment : SOUND CALIBRATOR
Manufacturer : RION
Model : NC-74
Serial No.: 34478386
ID No.: SGK_FS0011

Condition As Found : GOOD

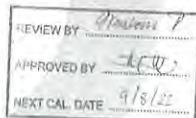
Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KIWAENG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location :
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

Received Date : 05 AUGUST 2021
Calibration Date : 09 AUGUST 2021
Date of Issue : 11 AUGUST 2021

Calibrated by : Nathakorn Pisutpaisan

Approved by :
(Thanakul Petchurui)



This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard, may not be reproduced other than in full, except with the prior written approval of the head of Calibration Laboratory

SITHIPORN ASSOCIATES CO., LTD.
CALIBRATION LABORATORY

Continuation of Calibration Certificate

Cert. No. : ACC21011
Job No. : VC64AC0059
Pages : 2 of 3

Calibration Procedure : CP-AC-03

Calibration Method :

This equipment was calibrated by based on JEC-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-0011-21	10-Feb-22
Digital Multimeter	33461A	MY53220104	EEL.BP. 05/0264	10-Feb-22
Digital Multimeter	8846A	1997025	EEL.BP. 06/0264	05-Feb-22
Digital Multimeter	33461A	MY53220116	EEL.BP. 04/0264	10-Feb-22
Programmable Attenuator	MAT-1070	62100114	1500-07774E	08-Mar-22
Condenser Microphone	4180	2977900	AA-1008-21	05-Feb-22
Measuring Amplifier	NA-42KA1	34560495	AA-3003-21	16-Feb-22
Audio Analyzer	AVR-3360A	V744B6069	EF-0010-21	10-Feb-22

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).

Continuation of Calibration Certificate

Cert. No. : ACC21011
Job No. : VC64AC0059
Pages : 3 of 3

Result of calibration :

1. Sound pressure level

Specified sound pressure level (dB)	Measured value (dB)	Deviated value (dB)	Uncertainty (dB)	Tolerance limit (dB)
94	94.12	0.12	0.14	0.40

2. Frequency

Specified Frequency (Hz)	Measured value (Hz)	Deviated value (%)	Uncertainty (%)	Tolerance limit (%)
1000	1002.5	0.2	0.1	1.0

3. Total distortion

Measured value (%)	Uncertainty (%)	Tolerance limit (%)
1.35	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

QF-TS12-04-04-020664

451-451/1 Sirinthorn Rd, Bangbunru, Bangkok Bangkok 10700 THAILAND.
Tel:0-2435-8800 Fax:0-2433-1679 e-mail:cal-center@sithiporn.com http://www.sithiporn.com



Cert. No. : ACL21129
Pages : 1 of 8

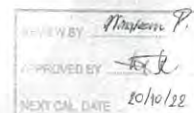
Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42/ Microphone UC-52 / Pre-amplifier NH-24
Serial No. : 00672670 / 170413 / 72911
ID No. : SGK_FS0023

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 : 08 OCTOBER 2021
Calibration Date : 20-21 OCTOBER 2021
Date of Issue : 26 OCTOBER 2021



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.

QF-TS12-04-04-020664

Continuation of Calibration Certificate

Cert. No. : ACL21129
Job No. : VC65AC0003
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by based 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-0012-21	10-Feb-22
Waveform Generator	33511B	MY52302742	EF-0011-21	10-Feb-22
Digital Multimeter	33461A	MY53220104	EEL.BP. 05/0264	10-Feb-22
Digital Multimeter	33461A	MY53220076	EEL.BP. 03/0264	08-Feb-22
Digital Multimeter	8846A	1997025	EEL.BP. 06/0264	05-Feb-22
Programmable Attenuator	MAT-1070	62100114	1500-07774E	08-Mar-22
Condenser Microphone	4180	2977900	AA-1008-21	05-Feb-22
Measuring Amplifier	NA-42KAI	34560495	AA-3003-21	16-Feb-22

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).

QF-TS12-04-04-020664

Continuation of Calibration Certificate

Cert. No. : ACL21129
Job No. : VC65AC0003
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Pass	Fail	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	-	-	-	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

QF-TS12-04-04-020664

Continuation of Calibration Certificate

Cert. No. : ACL21129
Job No. : VC65AC0003
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.96)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
16.1

2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency Weighting	Measured value (dB)
A - weight	13.4
C - weight	19.7
Flat	25.5

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	0.5	± 1.5
1000	-0.1	-0.1	-0.1	± 1.0
8000	-1.1	-1.0	-1.0	±5.0

QF-TS12-04-04-020664

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Continuation of Calibration Certificate

Cert. No. : ACL21129
Job No. : VC65AC0003
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	0.0	±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	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	0.0	-
C - weight	94.0	0.0	± 0.2
Flat	94.0	0.0	± 0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	0.0	-
Slow	94.0	0.0	± 0.1
Leq	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

QF-TS12-04-04-020664

T. Bha.

Continuation of Calibration Certificate

Cert. No. : ACL21129
Job No. : VC65AC0003
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	± 1.1
136.0	136.0	0.0	± 1.1
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	133.0	0.0	± 1.1
132.0	132.0	0.0	± 1.1
131.0	131.0	0.0	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.0	0.0	± 1.1
114.0	114.0	0.0	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.0	0.0	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.0	0.0	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	39.0	0.0	± 1.1
34.0	34.1	0.1	± 1.1
30.0	30.1	0.1	± 1.1
29.0	29.1	0.1	± 1.1
28.0	28.1	0.1	± 1.1
27.0	27.2	0.2	± 1.1
26.0	26.3	0.3	± 1.1
25.0	25.3	0.3	± 1.1

QF-TS12-04-04-020664

T. Bha.

Continuation of Calibration Certificate

Cert. No. : ACL21129
Job No. : VC65AC0003
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)
Auto	94.0	94.0	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

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Lepeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	-
One	136.4	136.2	-0.2	±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	-
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.1	-0.3	±2.0

QF-TS12-04-04-020664

T. Bha.

Continuation of Calibration Certificate

Cert. No. : ACL21129
Job No. : VC65AC0003
Pages : 8 of 8

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

QF-TS12-04-04-020664

451-451/1 Sirinthern Rd, Bangbunnu, Bangplud Bangkok 10700 THAILAND.
Tel:0-2435-8800 Fax:0-2433-1679 e-mail:cal-center@sithiporn.com http://www.sithiporn.comCert. No. : ACL21128
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42/ Microphone UC-52 / Preamplifier NH-24
Serial No.: 00572573 / 170156 / 73010
ID No.: SGK_FS0022

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWANG PHATTHANAKAN, KHET SUAN LUANG,
BANGKOK, 10250 THAILAND.

Location :
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

Received Date : 08 OCTOBER 2021
Calibration Date : 20-21 OCTOBER 2021
Date of Issue : 26 OCTOBER 2021

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.

QF-TS12-04-04-020664

Continuation of Calibration Certificate

Cert. No. : ACL21128
Job No. : VC65AC0003
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by based 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-0012-21	10-Feb-22
Waveform Generator	33511B	MY52302742	EF-0011-21	10-Feb-22
Digital Multimeter	33461A	MY53220104	EEL.BP. 05/0264	10-Feb-22
Digital Multimeter	33461A	MY53220076	EEL.BP. 03/0264	08-Feb-22
Digital Multimeter	8846A	1997025	EEL.BP. 06/0264	05-Feb-22
Programmable Attenuator	MAT-1070	62100114	1500-07774E	08-Mar-22
Condenser Microphone	4180	2977900	AA-1008-21	05-Feb-22
Measuring Amplifier	NA-42KAI	34560495	AA-3003-21	16-Feb-22

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).

QF-TS12-04-04-020664

Continuation of Calibration Certificate

Cert. No. : ACL21128
Job No. : VC65AC0003
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Pass	Fail	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	-	-	-	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

QF-TS12-04-04-020664

Continuation of Calibration Certificate

Cert. No. : ACL21128
Job No. : VC65AC0003
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.96)	93.9	0.0	±0.3

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
17.4

2.2 The microphone of the sound level meter was replaced by electrical signal input device.

Frequency Weighting	Measured value (dB)
A - weight	11.6
C - weight	17.4
Flat	23.2

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	0.2	0.2	0.2	± 1.5
1000	-0.2	-0.3	-0.2	± 1.0
8000	-2.0	-2.0	-1.9	±5.0

QF-TS12-04-04-020664

T. Retor

Continuation of Calibration Certificate

Cert. No. : ACL21128
Job No. : VC65AC0003
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	-0.2	-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	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	0.0	-
C - weight	94.0	0.0	± 0.2
Flat	94.0	0.0	± 0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	0.0	-
Slow	94.0	0.0	± 0.1
Leq	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

QF-TS12-04-04-020664

T. Retor

Continuation of Calibration Certificate

Cert. No. : ACL21128
Job No. : VC65AC0003
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	137.1	0.1	± 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	29.0	0.0	± 1.1
28.0	28.0	0.0	± 1.1
27.0	26.9	-0.1	± 1.1
26.0	25.9	-0.1	± 1.1
25.0	24.9	-0.1	± 1.1

QF-TS12-04-04-020664

T. Retor

Continuation of Calibration Certificate

Cert. No. : ACL21128
Job No. : VC65AC0003
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)
Auto	94.0	94.0	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

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Lepeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	-
One	136.4	136.3	-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	-
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.1	-0.3	±2.0

QF-TS12-04-04-020664

T. Retor

Continuation of Calibration Certificate

Cert. No. : ACL21128
Job No. : VC65AC0003
Pages : 8 of 8

11. Overload indication

Measured value (dB)		Deviated	Acceptance
Positive	Negative	Value	Limits
one-half cycle	one-half cycle	(dB)	(dB)
89.5	89.5	0.0	±1.5

12. High level stability

Frequency	SLM Display	SLM Display	Deviated	Acceptance
Weighting	at initial	at final	Value	Limits
	(dB)	(dB)	(dB)	(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

QF-TS12-04-04-020664

451-451/1 Sirinthorn Rd, Bangbunru, Bangkok Bangkok 10700 THAILAND.
Tel:0-2435-8800 Fax:0-2433-1679 e-mail:cal-center@sithiporn.com http://www.sithiporn.comCert. No. : ACL21132
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42/ Microphone UC-52 / Preamplifier NH-24
Serial No. : 00873118 / 171452 / 73494
ID No. : SGK_FS0026

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 : 08 OCTOBER 2021
Calibration Date : 20-21 OCTOBER 2021
Date of Issue : 26 OCTOBER 2021

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.

QF-TS12-04-04-020664

Continuation of Calibration Certificate

Cert. No. : ACL21132
Job No. : VC65AC0003
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by based 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-0012-21	10-Feb-22
Waveform Generator	33511B	MY52302742	EF-0011-21	10-Feb-22
Digital Multimeter	33461A	MY53220104	EEL.BP. 05/0264	10-Feb-22
Digital Multimeter	33461A	MY53220076	EEL.BP. 03/0264	08-Feb-22
Digital Multimeter	8846A	1997025	EEL.BP. 06/0264	05-Feb-22
Programmable Attenuator	MAT-1070	62100114	1500-07774E	08-Mar-22
Condenser Microphone	4180	2977900	AA-1008-21	05-Feb-22
Measuring Amplifier	NA-42KAI	34560495	AA-3003-21	16-Feb-22

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).

QF-TS12-04-04-020664

Continuation of Calibration Certificate

Cert. No. : ACL21132
Job No. : VC65AC0003
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Pass	Fail	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	-	-	-	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

QF-TS12-04-04-020664

Continuation of Calibration Certificate

Cert. No. : ACL21132
Job No. : VC65AC0003
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.96)	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	Measured value (dB)
A - weight	11.6
C - weight	17.9
Flat	23.5

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	0.0	0.1	0.1	± 1.5
1000	-0.2	-0.2	-0.2	± 1.0
8000	-0.2	-0.2	-0.2	± 5.0

QF-TS12-04-04-020664

T. P. L.

Continuation of Calibration Certificate

Cert. No. : ACL21132
Job No. : VC65AC0003
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	0.0	0.0	0.0	±1.5
250	0.0	0.0	-0.1	±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	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	0.0	-
C - weight	94.0	0.0	± 0.2
Flat	94.0	0.0	± 0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	0.0	-
Slow	94.0	0.0	± 0.1
Leq	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

QF-TS12-04-04-020664

T. P. L.

Continuation of Calibration Certificate

Cert. No. : ACL21132
Job No. : VC65AC0003
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	89.1	0.1	± 1.1
84.0	84.1	0.1	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.1	0.1	± 1.1
69.0	69.1	0.1	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.1	0.1	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	39.0	0.0	± 1.1
34.0	34.0	0.0	± 1.1
30.0	30.0	0.0	± 1.1
29.0	29.0	0.0	± 1.1
28.0	28.0	0.0	± 1.1
27.0	27.0	0.0	± 1.1
26.0	26.0	0.0	± 1.1
25.0	25.0	0.0	± 1.1

QF-TS12-04-04-020664

T. P. L.

Continuation of Calibration Certificate

Cert. No. : ACL21132
Job No. : VC65AC0003
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)
Auto	94.0	94.0	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	128.1	0.1	±1.0

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Lepeak (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	-
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	-
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

QF-TS12-04-04-020664

T. P. L.

Continuation of Calibration Certificate

Cert. No. : ACL21132
Job No. : VC65AC0003
Pages : 8 of 8

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle		
89.6	89.7	0.1	±1.5

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	137.0	137.0	0.0	±0.3

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor $k = 2$
or any value following calculation, providing a level of confidence of approximately 95 %

End of Calibration Certificate

QF-TS12-04-04-020664



ROTA METER CALIBRATION RESULT JANUARY 2022

Rotameter ID.	Calibration Date	Regression Result	Coefficient (R ²)
BKK_FS0577	05 Jan 22	$Y = 0.9899x + 0.9112$	0.9999
BKK_FS0579	05 Jan 22	$Y = 1.007x - 0.0299$	1.0000
BKK_FS0583	05 Jan 22	$Y = 1.0513x + 1.869$	0.9967
BKK_FS0584	05 Jan 22	$Y = 1.0048x - 1.069$	1.0000
BKK_FS0585	05 Jan 22	$Y = 1.0076x - 1.1036$	0.9999
BKK_FS0586	05 Jan 22	$Y = 0.9833x + 3.2655$	1.0000
BKK_FS0587	05 Jan 22	$Y = 1.0401x - 17.457$	0.9996
BKK_FS0588	05 Jan 22	$Y = 1.0154x + 4.8357$	0.9999
BKK_FS0589	05 Jan 22	$Y = 0.9918x + 4.8069$	0.9999
BKK_FS0590	05 Jan 22	$Y = 0.9861x + 10.07$	0.9995
BKK_FS0591	05 Jan 22	$Y = 1.0117x - 92.415$	0.9995
BKK_FS0592	05 Jan 22	$Y = 1.0031x - 69.305$	0.9996
BKK_FS0593	05 Jan 22	$Y = 1.0131x - 98.198$	0.9996
BKK_FS0594	05 Jan 22	$Y = 1.0075x - 7.0829$	0.9999
BKK_FS0595	05 Jan 22	$Y = 1.0249x - 98.162$	0.9999
BKK_FS0596	05 Jan 22	$Y = 0.9843x - 26.806$	0.9991
BKK_FS0597	05 Jan 22	$Y = 1.0203x - 122.14$	0.9999
BKK_FS1004	04 Jan 22	$Y = 0.9651x + 19.648$	0.9989
BKK_FS1005	04 Jan 22	$Y = 1.0096x + 4.6643$	0.9997
BKK_FS1006	04 Jan 22	$Y = 1.2188x - 7.1214$	0.9994
BKK_FS1007	05 Jan 22	$Y = 1.0563x - 1.0912$	1.0000
BKK_FS1008	05 Jan 22	$Y = 0.9689x + 1.9061$	1.0000
BKK_FS1009	05 Jan 22	$Y = 1.0132x + 1.1633$	0.9960
BKK_FS1010	05 Jan 22	$Y = 1.0033x + 0.5758$	0.9999
BKK_FS1014	05 Jan 22	$Y = 1.0021x + 0.3148$	0.9998
BKK_FS1015	05 Jan 22	$Y = 0.9994x + 1.786$	1.0000
BKK_FS1016	05 Jan 22	$Y = 1.0105x - 80.256$	0.9998
BKK_FS1017	05 Jan 22	$Y = 0.9995x + 0.649$	1.0000
BKK_FS1018	05 Jan 22	$Y = 1.0011x + 1.1786$	1.0000
BKK_FS1019	05 Jan 22	$Y = 1.0023x - 68.424$	0.9996
BKK_FS1020	05 Jan 22	$Y = 0.9887x + 2.8844$	0.9999
BKK_FS1021	05 Jan 22	$Y = 0.9659x + 1.4905$	0.9978
BKK_FS1022	05 Jan 22	$Y = 1.022x - 17.957$	0.9997
BKK_FS1023	05 Jan 22	$Y = 1.0094x + 0.0717$	0.9999
BKK_FS1024	05 Jan 22	$Y = 1.0042x + 0.4086$	0.9997
BKK_FS1025	05 Jan 22	$Y = 1.0132x - 88.507$	0.9996
BKK_FS1026	05 Jan 22	$Y = 0.9902x + 0.9554$	1.0000
BKK_FS1027	05 Jan 22	$Y = 1.0086x - 2.279$	1.0000
BKK_FS1028	05 Jan 22	$Y = 1.0105x - 81.055$	0.9997

Page 1 of 2

ALS Laboratory Group



ROTA METER CALIBRATION RESULT JANUARY 2022

Rotameter ID.	Calibration Date	Regression Result	Coefficient (R ²)
BKK_FS1029	05 Jan 22	$Y = 0.9935x + 0.8234$	1.0000
BKK_FS1030	05 Jan 22	$Y = 1.0039x + 0.515$	0.9999
BKK_FS1031	05 Jan 22	$Y = 1.006x - 79.295$	0.9998
BKK_FS1039	04 Jan 22	$Y = 0.9916x + 6.1524$	0.9988
BKK_FS1040	04 Jan 22	$Y = 1.0133x - 10.177$	0.9985
BKK_FS1041	04 Jan 22	$Y = 1.0805x - 1.7381$	0.9998
BKK_FS1042	04 Jan 22	$Y = 1.0061x + 1.3405$	0.9994
BKK_FS1043	04 Jan 22	$Y = 1.0112x - 10.393$	0.9999
BKK_FS1044	04 Jan 22	$Y = 1.0495x - 1.0136$	0.9996
BKK_FS1161	05 Jan 22	$Y = 0.9812x + 15571$	1.0000
BKK_FS1162	05 Jan 22	$Y = 0.9932x + 5.0014$	0.9997
BKK_FS1163	05 Jan 22	$Y = 1.0082x - 82.062$	0.9998
BKK_FS1164	05 Jan 22	$Y = 0.9914x + 0.8427$	0.9997
BKK_FS1165	05 Jan 22	$Y = 0.9893x + 6.5919$	0.9998
BKK_FS1166	05 Jan 22	$Y = 1.0031x - 77.881$	0.9996
RYG_FS0197	04 Jan 22	$Y = 1.0068x + 1.7152$	0.9998
RYG_FS0198	04 Jan 22	$Y = 0.9986x + 18.196$	0.9995
RYG_FS0199	04 Jan 22	$Y = 1.1202x - 3.5782$	0.9999

Review By :

Wichan Choonharat

(Mr. Wichan Choonharat)

Enviro Field Services Manager

Approved By :

(Mr. Sarayuth Jitranont)

Assistant General Manager



ROTA METER CALIBRATION RESULT APRIL 2022

Rotameter ID.	Calibration Date	Regression Result	Coefficient (R ²)
BKK_FS0577	01 Apr 22	$Y = 1.0202x + 0.1976$	1.0000
BKK_FS0579	01 Apr 22	$Y = 1.0078x + 0.4789$	0.9998
BKK_FS0583	01 Apr 22	$Y = 1.016x + 0.3922$	1.0000
BKK_FS0584	01 Apr 22	$Y = 1.0036x + 2.2262$	0.9997
BKK_FS0585	01 Apr 22	$Y = 1.0189x - 5.6476$	0.9997
BKK_FS0586	01 Apr 22	$Y = 1.0095x - 1.1524$	0.9995
BKK_FS0587	01 Apr 22	$Y = 1.013x - 3.6619$	0.9996
BKK_FS0588	01 Apr 22	$Y = 1.0154x + 4.8357$	0.9999
BKK_FS0589	01 Apr 22	$Y = 0.9918x + 4.8069$	0.9999
BKK_FS0590	01 Apr 22	$Y = 1.0038x - 0.4857$	0.9996
BKK_FS0591	01 Apr 22	$Y = 0.9705x - 52.174$	0.9986
BKK_FS0592	01 Apr 22	$Y = 0.9646x - 37.642$	0.9985
BKK_FS0593	01 Apr 22	$Y = 0.9767x - 58.445$	0.9988
BKK_FS0594	01 Apr 22	$Y = 0.9902x - 62.87$	0.9999
BKK_FS0595	01 Apr 22	$Y = 1.0249x - 98.162$	0.9999
BKK_FS0596	01 Apr 22	$Y = 0.9843x - 26.806$	0.9991
BKK_FS0597	01 Apr 22	$Y = 0.9802x - 61.653$	0.9978
BKK_FS1004	01 Apr 22	$Y = 0.9696x + 17.69$	0.9990
BKK_FS1005	01 Apr 22	$Y = 1.0065x + 5.6786$	0.9997
BKK_FS1006	01 Apr 22	$Y = 1.2142x - 7.1037$	0.9993
BKK_FS1007	01 Apr 22	$Y = 0.9917x + 1.6592$	1.0000
BKK_FS1008	01 Apr 22	$Y = 1.0132x + 0.7207$	1.0000
BKK_FS1009	01 Apr 22	$Y = 1.0132x + 1.1633$	0.9960
BKK_FS1010	01 Apr 22	$Y = 1.0033x + 0.5758$	0.9999
BKK_FS1011	01 Apr 22	$Y = 1.0234x + 0.1759$	0.9996
BKK_FS1012	01 Apr 22	$Y = 1.0106x - 2.0048$	0.9997
BKK_FS1013	01 Apr 22	$Y = 0.9677x - 35.851$	0.9997
BKK_FS1014	01 Apr 22	$Y = 1.0021x + 0.3148$	0.9998
BKK_FS1015	01 Apr 22	$Y = 0.9994x + 1.786$	1.0000
BKK_FS1016	01 Apr 22	$Y = 1.0105x - 80.256$	0.9998
BKK_FS1017	01 Apr 22	$Y = 0.9995x + 0.649$	1.0000
BKK_FS1018	01 Apr 22	$Y = 1.0011x + 1.1786$	1.0000
BKK_FS1019	01 Apr 22	$Y = 1.0023x - 68.424$	0.9996
BKK_FS1020	01 Apr 22	$Y = 1.0547x - 0.666$	0.9998
BKK_FS1021	01 Apr 22	$Y = 1.018x - 3.3286$	0.9998
BKK_FS1022	01 Apr 22	$Y = 0.9932x - 57.035$	0.9986
BKK_FS1023	01 Apr 22	$Y = 1.0094x + 0.0717$	0.9999
BKK_FS1024	01 Apr 22	$Y = 1.0042x + 0.4086$	0.9997



ROTA METER CALIBRATION RESULT APRIL 2022

Rotameter ID.	Calibration Date	Regression Result	Coefficient (R ²)
BKK_FS1025	01 Apr 22	$Y = 1.0132x - 88.507$	0.9996
BKK_FS1026	01 Apr 22	$Y = 1.0018x + 1.0776$	0.9997
BKK_FS1027	01 Apr 22	$Y = 1.0053x + 0.231$	0.9995
BKK_FS1028	01 Apr 22	$Y = 0.9792x - 60.312$	0.9982
BKK_FS1029	01 Apr 22	$Y = 0.9935x + 0.8234$	1.0000
BKK_FS1030	01 Apr 22	$Y = 1.0039x + 0.515$	0.9999
BKK_FS1031	01 Apr 22	$Y = 1.009x - 79.295$	0.9998
BKK_FS1039	01 Apr 22	$Y = 0.9868x + 7.8119$	0.9993
BKK_FS1040	01 Apr 22	$Y = 1.0096x - 7.2905$	0.9990
BKK_FS1041	01 Apr 22	$Y = 1.076x - 2.0503$	0.9999
BKK_FS1042	01 Apr 22	$Y = 1.0054x + 1.6095$	0.9995
BKK_FS1043	01 Apr 22	$Y = 1.0108x - 11.048$	0.9999
BKK_FS1044	01 Apr 22	$Y = 1.0468x - 0.9391$	0.9997
BKK_FS1161	01 Apr 22	$Y = 1.0126x + 0.7738$	0.9999
BKK_FS1162	01 Apr 22	$Y = 0.9994x + 2.6357$	0.9995
BKK_FS1163	01 Apr 22	$Y = 0.977x - 55.03$	0.9987
BKK_FS1164	01 Apr 22	$Y = 0.9914x + 0.8427$	0.9997
BKK_FS1165	01 Apr 22	$Y = 0.9893x + 6.5919$	0.9998
BKK_FS1166	01 Apr 22	$Y = 1.0031x - 77.881$	0.9996
RYG_FS0197	01 Apr 22	$Y = 1.0055x + 1.1914$	0.9998
RYG_FS0198	01 Apr 22	$Y = 0.996x + 23.788$	0.9996
RYG_FS0199	01 Apr 22	$Y = 1.1166x - 3.3942$	0.9998

Review By :

(Mr. Wichan Choonharat)

Enviro Field Services Manager

Approved By :

(Mr. Sarayuth Jittrantorn)

Assistant General Manager

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Agilent CrossLab Compliance Services

Certificate of System Qualification

GC-QQ

System ID: GC-6
Organization Name: ALS Laboratory Group (Thailand) Co., Ltd.
Organization Location: 104 Phattanakarn 40, Phattanakarn Rd., Suan Luang, Bangkok 10250

Date: October 21, 2021 10:05:40 AM
EQP Name: Agilent Recommended
EQP Revision: GC 02 50
Overall Qualification Status: Pass

REVIEW BY: Suchada T.
APPROVED BY: Sarayuth J.
NEXT CAL DATE: 21 Apr 2023

System Inspection and Basic Safety and Operation

Name: 7890
Setpoint Status: Pass

Overall System Inspection and Basic Safety and Operation Test Status

Pass

Inlet Pressure Decay

Name: 7890
Front SSL
Setpoint Status: Pass
Pressure: 25.0 psi
Pressure Change: 0.0 psi / 5 minutes
Agilent Recommended: ≥ -2.0 and ≤ 0.5

Overall Inlet Pressure Decay Test Status

Pass

Inlet Pressure Accuracy

Name: 7890
Front SSL

Date: October 21, 2021 10:05:40 AM
System ID: GC-6

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Setpoint Status: Pass

Setpoint Actual
Inlet Pressure: 25.0 psi 24.9 psi
Accuracy: 0.1 psi
Agilent Recommended: ≤ 1.2

Overall Inlet Pressure Accuracy Test Status

Pass

Inlet Pressure Decay

Name: 7890
Back SSL

Setpoint Status: Pass
Pressure: 25.0 psi
Pressure Change: 0.0 psi / 5 minutes
Agilent Recommended: ≥ -2.0 and ≤ 0.5

Overall Inlet Pressure Decay Test Status

Pass

Inlet Pressure Accuracy

Name: 7890
Back SSL

Setpoint Status: Pass
Setpoint Actual
Inlet Pressure: 25.0 psi 24.9 psi
Accuracy: 0.1 psi
Agilent Recommended: ≤ 1.2

Overall Inlet Pressure Accuracy Test Status

Pass

Detector Flow Accuracy

Date: October 21, 2021 10:05:40 AM
System ID: GC-6

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Name: 7890
Front FID

Setpoint Status: Pass

Flow Type: Fuel
Setpoint Measured Flow
30.0 mL/min 30.5 mL/min
Accuracy: 0.5 mL/min
Agilent Recommended: ≤ 10.0 % setpoint (3.0 mL/min)
Limit is percentage of setpoint or 0.5 mL/minute, whichever is largest.

Setpoint Status: Pass

Flow Type: Oxidizer
Setpoint Measured Flow
400.0 mL/min 394.0 mL/min
Accuracy: 6.0 mL/min
Agilent Recommended: ≤ 10.0 % setpoint (40.0 mL/min)
Limit is percentage of setpoint or 0.5 mL/minute, whichever is largest.

Setpoint Status: Pass

Flow Type: Makeup
Setpoint Measured Flow
25.0 mL/min 24.2 mL/min
Accuracy: 0.8 mL/min
Agilent Recommended: ≤ 10.0 % setpoint (2.5 mL/min)
Limit is percentage of setpoint or 0.5 mL/minute, whichever is largest.

Overall Detector Flow Accuracy Test Status

Pass

Detector Flow Accuracy

Name: 7890
Back FID

Date: October 21, 2021 10:05:40 AM
System ID: GC-6

Setpoint Status: Pass

Flow Type: Fuel
Setpoint: 30.0 mL/min Measured Flow: 29.1 mL/minAccuracy: 0.9 mL/min
Agilent Recommended: ≤ 10.0 % setpoint (3.0 mL/min)

Limit is percentage of setpoint or 0.5 mL/minute, whichever is largest.

Setpoint Status: Pass

Flow Type: Oxidizer
Setpoint: 400.0 mL/min Measured Flow: 397.3 mL/minAccuracy: 2.7 mL/min
Agilent Recommended: ≤ 10.0 % setpoint (40.0 mL/min)

Limit is percentage of setpoint or 0.5 mL/minute, whichever is largest.

Setpoint Status: Pass

Flow Type: Makeup
Setpoint: 25.0 mL/min Measured Flow: 24.4 mL/minAccuracy: 0.6 mL/min
Agilent Recommended: ≤ 10.0 % setpoint (2.5 mL/min)

Limit is percentage of setpoint or 0.5 mL/minute, whichever is largest.

Overall Detector Flow Accuracy Test Status

Pass

GC Oven Temperature Accuracy

Name: 7890

Date: October 21, 2021 10:05:40 AM
System ID: GC-6

Page 4 / 22

Setpoint Status: Pass

Zone: Oven

Setpoint/Actual
Temperature: 230.0 231.5 °CAccuracy: 1.5 °C
Agilent Recommended: ≥ -1.0 % setpoint in K (-5.0 °C)
 ≤ 1.0 % setpoint in K (5.0 °C)

Setpoint Status: Pass

Zone: Oven

Setpoint/Actual
Temperature: 100.0 100.5 °CAccuracy: 0.5 °C
Agilent Recommended: ≥ -1.0 % setpoint in K (-3.7 °C)
 ≤ 1.0 % setpoint in K (3.7 °C)

Overall GC Oven Temperature Accuracy Test Status

Pass

GC Oven Temperature Stability

Name: 7890

Setpoint Status: Pass

Setpoint/Average
Temperature: 100.0 100.4667 °CStability: 0.1 °C
Agilent Recommended: ≤ 0.5

Overall GC Oven Temperature Stability Test Status

Pass

Scouting Run

Tested Combination1 Front SSL / Front FID

Injection Tower

Name: 7693A

Date: October 21, 2021 10:05:40 AM
System ID: GC-6

Page 5 / 22

Setpoint Status: Completed

Injection Volume on Column: 1.0 μ L

Overall Scouting Run Status

Completed

Noise and Drift

Tested Combination1 Front SSL / Front FID
Name: 7890

Setpoint Status: Pass

Base Signal: 12.7 pA

ASTM Noise

pA

0.06

Drift

pA/hr

0.10

Agilent Recommended: ≤ 0.10 ≤ 2.50

Status: Pass Pass

Overall Noise and Drift Test Status

Pass

Injection Precision

Tested Combination1 Front SSL / Front FID
Name: 7693A

Setpoint Status: Pass

Injection Volume on Column: 1.0 μ LArea RSD: 0.42 % Retention Time RSD: 0.16 %
Agilent Recommended: ≤ 3.00 ≤ 1.00

Overall Injection Precision Test Status

Pass

Signal to Noise

Date: October 21, 2021 10:05:40 AM
System ID: GC-6

Page 6 / 22

Tested Combination1 Front SSL / Front FID

Injection Tower

Name: 7890

Setpoint Status: Pass

Signal to Noise: 1174861

Agilent Recommended: ≥ 300000

Overall Signal to Noise Test Status

Pass

Scouting Run

Tested Combination2 Back SSL / Back FID

Injection Tower

Name: 7693A

Setpoint Status: Completed

Injection Volume on Column: 1.0 μ L

Overall Scouting Run Status

Completed

Noise and Drift

Tested Combination2 Back SSL / Back FID

Name: 7890

Setpoint Status: Pass

Base Signal: 10.4 pA

ASTM Noise

pA

0.05

Drift

pA/hr

0.00

Agilent Recommended: ≤ 0.10 ≤ 2.50

Status: Pass Pass

Date: October 21, 2021 10:05:40 AM
System ID: GC-6

Page 7 / 22

Overall Noise and Drift Test Status
Pass**Injection Precision**

Tested Combination2	Back	SSL	/ Back	FID
Name:	7693A			
Setpoint Status:	Pass			
Injection Volume on Column:	1.0	µL		
Area RSD:	1.16	%	Retention Time RSD:	0.12 %
Agilent Recommended:	<= 3.00		<= 1.00	

Overall Injection Precision Test Status
Pass**Signal to Noise**

Tested Combination2	Back	SSL	/ Back	FID
Name:	Injection Tower			
	7690			
Setpoint Status:	Pass			
Signal to Noise	805466			
Agilent Recommended:	>= 300000			

Overall Signal to Noise Test Status
Pass

Date: October 21, 2021 10:05:40 AM
System ID: GC-6

Page 8 / 22

Instrument Details**Purpose**

This section describes the as found system configuration

Details

System:	
System ID	GC-6
Manufacturer	Agilent Technologies
Name	7690
Flow Data Input	Manual Data
Temperature Data Input	Manual Data or Other Data Logging
Tested Combination1	
Injection Technique	Injection Tower
Sampler Identifier	Sampler 2
Inlet	Front
Detector	Front
LTM Included?	No
Tested Combination2	
Injection Technique	Injection Tower
Sampler Identifier	Sampler 3
Inlet	Back
Detector	Back
LTM Included?	No
Sampler 1	
Manufacturer	Agilent Technologies
Type	Tray
Name	7693A
Model Number	G4514A
Serial Number	CN15360030
Firmware Revision	A.11.01
Val Heater	Not installed

Date: October 21, 2021 10:05:40 AM
System ID: GC-6

Page 9 / 22

Sampler 2

Manufacturer	Agilent Technologies
Type	Injection Tower
Name	7693A
Model Number	G4513A
Serial Number	CN10340103
Firmware Revision	A.10.09
Usage	Sample Injection
Location	Front
Syringe Volume (µL)	10

Sampler 3

Manufacturer	Agilent Technologies
Type	Injection Tower
Name	7693A
Model Number	G4513A
Serial Number	CN16280128
Firmware Revision	A.10.09
Usage	Sample Injection
Location	Back
Syringe Volume (µL)	10

Mainframe 1

Manufacturer	Agilent Technologies
Name	7690
Model Number	G3440A
Serial Number	CN11461066
Firmware Revision	Version 4.27
Component ID/Asset No.	GC-6
Oven Type	Standard

Date: October 21, 2021 10:05:40 AM
System ID: GC-6

Page 10 / 22

Inlet 1

Manufacturer	Agilent Technologies
Name	7690
Type	SSL
Location	Front
Carrier Gas	Helium
Control Type	Electronic Pressure Control (EPC)
Purged Inlet	Yes

Inlet 2

Manufacturer	Agilent Technologies
Name	7690
Type	SSL
Location	Back
Carrier Gas	Helium
Control Type	Electronic Pressure Control (EPC)
Purged Inlet	Yes

Detector 1

Manufacturer	Agilent Technologies
Name	7690
Type	FID
Adapter	Capillary
Control Type	Electronic Pressure Control (EPC)
Location	Front
Makeup Gas	Nitrogen

Detector 2

Manufacturer	Agilent Technologies
Name	7690
Type	FID
Adapter	Capillary
Control Type	Electronic Pressure Control (EPC)
Location	Back
Makeup Gas	Nitrogen

Date: October 21, 2021 10:05:40 AM
System ID: GC-6

Page 11 / 22

Electronic Signature

Purpose

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Reason for Signature: Executed protocol and published this original version of document

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This document provides a protocol to verify and record instrument configuration and evidence of proper operation. It has been prepared from our interpretation of applicable regulations as well as industry best practices. The document is designed to provide an important component of a complete compliance package. Validation depends upon many factors and use of this protocol alone does not assure compliance. Agilent Technologies makes no promises or representations as to its sufficiency for any specific regulatory program.

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Date: October 21, 2021 10:05:40 AM
System ID: GC-6

Page 12 / 22

User Name: suriya.thongkaew System ID: GC-6
Hostname: ASDNKRW7815 Print Date: October 21, 2021 10:05:46 AM

OQ GC ALS CN11461066 Transaction log:

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
October 20, 2021 12:18:50 PM	Audit	Session Creation	Session	None
October 20, 2021 12:18:50 PM	Start	Configuration	Session	None
October 20, 2021 12:18:50 PM	Audit	Entitlement	Licensing	User is Nonpaying and does not require an unlock code
October 20, 2021 12:24:57 PM	Audit	Exp. loaded	Session	EQIP details for primary technique [GC]- File path: [Protocol\Facility\GC\Config\jms\02 51\02 51 eqp] EQIP File Name: [GC 02 51 eqp] EQIP Name: [Agilent\Recommend]
October 20, 2021 12:25:02 PM	End	Configuration	Session	None
October 20, 2021 12:25:08 PM	Start	Qualification	Session	OQ
October 20, 2021 12:25:09 PM	Start	Execution	System Inspection and Basic Safety and Operation - 7890 - Qualitative Test - No setpoints associated	None
October 20, 2021 12:30:25 PM	End	Execution	System Inspection and Basic Safety and Operation - 7890 - Qualitative Test - No setpoints associated	Run Count: 1
October 20, 2021 12:58:29 PM	Start	Execution	Inlet Pressure Decay - Front SCL - Pressure Controlled Inlet - S: 25.0 psi - L: >= 2.0 psi and <= 0.5 psi	None

Page 1 / 10

Date: October 21, 2021 10:05:40 AM
System ID: GC-6

Page 13 / 22

User Name: suriya.thongkaew System ID: GC-6
Hostname: ASDNKRW7815 Print Date: October 21, 2021 10:05:46 AM

OQ GC ALS CN11461066 Transaction log:

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
October 20, 2021 1:02:18 PM	End	Execution	Inlet Pressure Decay - Front SCL - Pressure Controlled Inlet - S: 25.0 psi - L: >= 2.0 psi and <= 0.5 psi	Run Count: 1
October 20, 2021 1:02:18 PM	Start	Execution	Inlet Pressure Accuracy - Front SCL - Pressure Controlled Inlet - S: 25.0 psi - L: <= 1.2 psi	None
October 20, 2021 1:02:26 PM	End	Execution	Inlet Pressure Accuracy - Front SCL - Pressure Controlled Inlet - S: 25.0 psi - L: <= 1.2 psi	Run Count: 1
October 20, 2021 1:02:29 PM	Start	Execution	Inlet Pressure Decay - Back SCL - Pressure Controlled Inlet - S: 25.0 psi - L: >= 2.0 psi and <= 0.5 psi	None
October 20, 2021 1:04:21 PM	End	Execution	Inlet Pressure Decay - Back SCL - Pressure Controlled Inlet - S: 25.0 psi - L: >= 2.0 psi and <= 0.5 psi	Run Count: 1
October 20, 2021 1:07:53 PM	Start	Execution	Inlet Pressure Accuracy - Back SCL - Pressure Controlled Inlet - S: 25.0 psi - L: <= 1.2 psi	None
October 20, 2021 1:08:11 PM	End	Execution	Inlet Pressure Accuracy - Back SCL - Pressure Controlled Inlet - S: 25.0 psi - L: <= 1.2 psi	Run Count: 1
October 20, 2021 1:08:16 PM	Start	Execution	Detector Flow Accuracy - Front FID - Type: Fuel - S: 30.0 mL/min - L: <= 10.0% setpoint	None
October 20, 2021 1:20:23 PM	Audit	Data	Detector Flow Accuracy - Front FID - Type: Fuel - S: 30.0 mL/min - L: <= 10.0% setpoint	Manual Data Entry
October 20, 2021 1:20:26 PM	End	Execution	Detector Flow Accuracy - Front FID - Type: Fuel - S: 30.0 mL/min - L: <= 10.0% setpoint	Run Count: 1

Page 2 / 10

Date: October 21, 2021 10:05:40 AM
System ID: GC-6

Page 14 / 22

User Name: suriya.thongkaew System ID: GC-6
Hostname: ASDNKRW7815 Print Date: October 21, 2021 10:05:46 AM

OQ GC ALS CN11461066 Transaction log:

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
October 20, 2021 1:20:29 PM	Start	Execution	Detector Flow Accuracy - Front FID - Type: Oxidizer - S: 400.0 mL/min - L: <= 10.0% setpoint	None
October 20, 2021 1:23:27 PM	Audit	Data	Detector Flow Accuracy - Front FID - Type: Oxidizer - S: 400.0 mL/min - L: <= 10.0% setpoint	Manual Data Entry
October 20, 2021 1:23:28 PM	End	Execution	Detector Flow Accuracy - Front FID - Type: Oxidizer - S: 400.0 mL/min - L: <= 10.0% setpoint	Run Count: 1
October 20, 2021 1:23:31 PM	Start	Execution	Detector Flow Accuracy - Front FID - Type: Makeup - S: 25.0 mL/min - L: <= 10.0% setpoint	None
October 20, 2021 1:27:40 PM	Audit	Data	Detector Flow Accuracy - Front FID - Type: Makeup - S: 25.0 mL/min - L: <= 10.0% setpoint	Manual Data Entry
October 20, 2021 1:27:42 PM	End	Execution	Detector Flow Accuracy - Front FID - Type: Makeup - S: 25.0 mL/min - L: <= 10.0% setpoint	Run Count: 1
October 20, 2021 1:27:48 PM	Start	Execution	Detector Flow Accuracy - Back FID - Type: Fuel - S: 30.0 mL/min - L: <= 10.0% setpoint	None
October 20, 2021 1:32:10 PM	Audit	Data	Detector Flow Accuracy - Back FID - Type: Fuel - S: 30.0 mL/min - L: <= 10.0% setpoint	Manual Data Entry
October 20, 2021 1:32:12 PM	End	Execution	Detector Flow Accuracy - Back FID - Type: Fuel - S: 30.0 mL/min - L: <= 10.0% setpoint	Run Count: 1
October 20, 2021 1:32:14 PM	Start	Execution	Detector Flow Accuracy - Back FID - Type: Oxidizer - S: 400.0 mL/min - L: <= 10.0% setpoint	None
October 20, 2021 1:34:12 PM	Audit	Data	Detector Flow Accuracy - Back FID - Type: Oxidizer - S: 400.0 mL/min - L: <= 10.0% setpoint	Manual Data Entry

Page 3 / 10

Date: October 21, 2021 10:05:40 AM
System ID: GC-6

Page 15 / 22

User Name: suriya.thongkiew
Host Name: ASDKRW7015
System ID: GC-6
Print Date: October 21, 2021 10:05:40 AM

GC GC ALS CN11461066 Transaction log

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
October 20, 2021 1:34:16 PM	End	Execution	Detector Flow Accuracy - Back FID - Type: Makeup - S: 400.0 mL/min - L: <= 10.0% setpoint	Run Count: 1
October 20, 2021 1:34:46 PM	Start	Execution	Detector Flow Accuracy - Back FID - Type: Makeup - S: 25.0 mL/min - L: <= 10.0% setpoint	None
October 20, 2021 1:36:33 PM	Audit	Data	Detector Flow Accuracy - Back FID - Type: Makeup - S: 25.0 mL/min - L: <= 10.0% setpoint	Manual Data Entry
October 20, 2021 1:36:36 PM	End	Execution	Detector Flow Accuracy - Back FID - Type: Makeup - S: 25.0 mL/min - L: <= 10.0% setpoint	Run Count: 1
October 20, 2021 1:36:38 PM	Start	Execution	GC Oven Temperature Accuracy - 7890 - Temperature: Oven - S: 230.0°C - L: >= 1.0 AND <= 1.0 % setpoint in K	None
October 20, 2021 2:04:31 PM	Audit	Data	GC Oven Temperature Accuracy - 7890 - Temperature: Oven - S: 230.0°C - L: >= 1.0 AND <= 1.0 % setpoint in K	Manual Data Entry
October 20, 2021 2:04:32 PM	End	Execution	GC Oven Temperature Accuracy - 7890 - Temperature: Oven - S: 230.0°C - L: >= 1.0 AND <= 1.0 % setpoint in K	Run Count: 1
October 20, 2021 2:04:34 PM	Start	Execution	GC Oven Temperature Accuracy - 7890 - Temperature: Oven - S: 100.0°C - L: >= 1.0 AND <= 1.0 % setpoint in K	None
October 20, 2021 2:10:47 PM	Audit	Data	GC Oven Temperature Accuracy - 7890 - Temperature: Oven - S: 100.0°C - L: >= 1.0 AND <= 1.0 % setpoint in K	Manual Data Entry

Page 4 / 10

Date: October 21, 2021 10:05:40 AM
System ID: GC-6

Page 16 / 22

User Name: suriya.thongkiew
Host Name: ASDKRW7015
System ID: GC-6
Print Date: October 21, 2021 10:05:40 AM

GC GC ALS CN11461066 Transaction log

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
October 20, 2021 2:10:49 PM	End	Execution	GC Oven Temperature Accuracy - 7890 - Temperature: Oven - S: 100.0°C - L: >= 1.0 AND <= 1.0 % setpoint in K	Run Count: 1
October 20, 2021 2:10:51 PM	Start	Execution	GC Oven Temperature Stability - 7890 - Temperature: Oven - S: 100.0°C - L: <= 0.5°C	None
October 20, 2021 2:31:36 PM	Audit	Data	GC Oven Temperature Stability - 7890 - Temperature: Oven - S: 100.0°C - L: <= 0.5°C	Manual Data Entry
October 20, 2021 2:31:41 PM	End	Execution	GC Oven Temperature Stability - 7890 - Temperature: Oven - S: 100.0°C - L: <= 0.5°C	Run Count: 1
October 20, 2021 2:31:44 PM	Start	Execution	GC Scouting Run - Injection Tower, Front SSL, Front FID - Part of System Preparation - No limits associated	None
October 20, 2021 2:43:06 PM	Audit	AcqClosed	Session	None
October 21, 2021 9:18:59 AM	Audit	AcqRestarted	Session	None
October 21, 2021 9:19:02 AM	Audit	SessionReloading	Session	None
October 21, 2021 9:19:09 AM	Start	Qualification	Session	GC
October 21, 2021 9:19:09 AM	Start	Execution	GC Scouting Run - Injection Tower, Front SSL, Front FID - Part of System Preparation - No limits associated	None
October 21, 2021 9:19:41 AM	Audit	AcqClosed	Session	None

Page 5 / 10

Date: October 21, 2021 10:05:40 AM
System ID: GC-6

Page 17 / 22

User Name: suriya.thongkiew
Host Name: ASDKRW7015
System ID: GC-6
Print Date: October 21, 2021 10:05:40 AM

GC GC ALS CN11461066 Transaction log

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
October 21, 2021 9:20:08 AM	Audit	AcqRestarted	Session	None
October 21, 2021 9:20:09 AM	Audit	SessionReloading	Session	None
October 21, 2021 9:26:13 AM	Start	Qualification	Session	GC
October 21, 2021 9:26:13 AM	Start	Execution	GC Scouting Run - Injection Tower, Front SSL, Front FID - Part of System Preparation - No limits associated	None
October 21, 2021 9:29:45 AM	Audit	Data	GC Scouting Run - Injection Tower, Front SSL, Front FID - C:\Chem32\10DATA\AQGPV20 210QPV2021_F 2021-10-20 Part of System Preparation - No limits associated	15:49:01SCOUT_F001.D\F1A.ch
October 21, 2021 9:30:05 AM	End	Execution	GC Scouting Run - Injection Tower, Front SSL, Front FID - Part of System Preparation - No limits associated	Run Count: 1
October 21, 2021 9:30:06 AM	Start	Execution	Noise and Drift - Front FID - Detector FID - L (Noise) <= 0.10 pA - L (Drift) <= 2.50 pA/hour	None
October 21, 2021 9:30:41 AM	Audit	Data	Noise and Drift - Front FID - Detector FID - L (Noise) <= 0.10 pA - L (Drift) <= 2.50 pA/hour	Data file Path: C:\Chem32\10DATA\AQGPV20 210QPV2021_F 2021-10-20 15:49:01SCOUT_F001.D\F1A.ch
October 21, 2021 9:31:10 AM	End	Execution	Noise and Drift - Front FID - Detector FID - L (Noise) <= 0.10 pA - L (Drift) <= 2.50 pA/hour	Run Count: 1

Page 6 / 10

Date: October 21, 2021 10:05:40 AM
System ID: GC-6

Page 18 / 22

User Name: suriya.thongkiew
Host Name: ASDKRW7015
System ID: GC-6
Print Date: October 21, 2021 10:05:40 AM

GC GC ALS CN11461066 Transaction log

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
October 21, 2021 9:31:42 AM	Start	Execution	Injection Precision - Injection Tower, Front SSL, Front FID - GC - L (Area) <= 3.00% - L (Ret. Time) <= 1.00%	None
October 21, 2021 9:32:55 AM	Audit	Data	Injection Precision - Injection Tower, Front SSL, Front FID - GC - L (Area) <= 3.00% - L (Ret. Time) <= 1.00%	Data file Path: C:\Chem32\10DATA\AQGPV20 210QPV2021_F 2021-10-20 16:51:16INJPREC_F002.D\F1A.ch
October 21, 2021 9:32:56 AM	Audit	Data	Injection Precision - Injection Tower, Front SSL, Front FID - GC - L (Area) <= 3.00% - L (Ret. Time) <= 1.00%	Data file Path: C:\Chem32\10DATA\AQGPV20 210QPV2021_F 2021-10-20 16:51:16INJPREC_F003.D\F1A.ch
October 21, 2021 9:32:56 AM	Audit	Data	Injection Precision - Injection Tower, Front SSL, Front FID - GC - L (Area) <= 3.00% - L (Ret. Time) <= 1.00%	Data file Path: C:\Chem32\10DATA\AQGPV20 210QPV2021_F 2021-10-20 16:51:16INJPREC_F004.D\F1A.ch
October 21, 2021 9:32:56 AM	Audit	Data	Injection Precision - Injection Tower, Front SSL, Front FID - GC - L (Area) <= 3.00% - L (Ret. Time) <= 1.00%	Data file Path: C:\Chem32\10DATA\AQGPV20 210QPV2021_F 2021-10-20 16:51:16INJPREC_F005.D\F1A.ch
October 21, 2021 9:32:56 AM	Audit	Data	Injection Precision - Injection Tower, Front SSL, Front FID - GC - L (Area) <= 3.00% - L (Ret. Time) <= 1.00%	Data file Path: C:\Chem32\10DATA\AQGPV20 210QPV2021_F 2021-10-20 16:51:16INJPREC_F006.D\F1A.ch
October 21, 2021 9:32:56 AM	Audit	Data	Injection Precision - Injection Tower, Front SSL, Front FID - GC - L (Area) <= 3.00% - L (Ret. Time) <= 1.00%	Data file Path: C:\Chem32\10DATA\AQGPV20 210QPV2021_F 2021-10-20 16:51:16INJPREC_F007.D\F1A.ch

Page 7 / 10

Date: October 21, 2021 10:05:40 AM
System ID: GC-6

Page 19 / 22

User Name: kurya.thongkue
Host Name: ASBANK7015
System ID: GC-6
Print Date: October 21, 2021 10:05:40 AM

QC GC ALS CN11461066 Transaction log:

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
October 21, 2021 9:33:07 AM	End	Execution	Injection Precision - Injection Tower, Front SSL, Front FID - GC - L (Area) <= 3.00% - L (Ret. Time) <= 1.00%	Run Count: 1
October 21, 2021 9:33:23 AM	Start	Execution	Signal to Noise - Injection Tower, Front SSL, Front FID - Detector FID - L <= 300000	None
October 21, 2021 9:34:01 AM	Audit	Data	Signal to Noise - Injection Tower, Front SSL, Front FID - Detector FID - L <= 300000	Data File Path: C:\Chem32\1\DATA\AQGPV20\21\OQPV2021_B 2021-10-20 17-13-45\INPREC_B001.D\FID28.ch
October 21, 2021 9:34:15 AM	End	Execution	Signal to Noise - Injection Tower, Front SSL, Front FID - Detector FID - L <= 300000	Run Count: 1
October 21, 2021 9:34:19 AM	Start	Execution	QC Scouting Run - Injection Tower, Back SSL, Back FID - Part of System Preparation - No limits associated	None
October 21, 2021 9:35:04 AM	Audit	Data	QC Scouting Run - Injection Tower, Back SSL, Back FID - Part of System Preparation - No limits associated	Data File Path: C:\Chem32\1\DATA\AQGPV20\21\OQPV2021_B 2021-10-20 17-13-45\INPREC_B002.D\FID28.ch
October 21, 2021 9:35:27 AM	End	Execution	QC Scouting Run - Injection Tower, Back SSL, Back FID - Part of System Preparation - No limits associated	Run Count: 1
October 21, 2021 9:35:32 AM	Start	Execution	Noise and Drift - Back FID - Detector FID - L (Noise) <= 6.10 pA - L (Drift) <= 2.50 pA/hour	None

Page 8 / 10

Date: October 21, 2021 10:05:40 AM
System ID: GC-6

Page 20 / 22

User Name: kurya.thongkue
Host Name: ASBANK7015
System ID: GC-6
Print Date: October 21, 2021 10:05:40 AM

QC GC ALS CN11461066 Transaction log:

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
October 21, 2021 9:36:06 AM	Audit	Data	Noise and Drift - Back FID - Detector FID - L (Noise) <= 6.10 pA - L (Drift) <= 2.50 pA/hour	Data File Path: C:\Chem32\1\DATA\AQGPV20\21\OQPV2021_B 2021-10-20 17-13-45\INPREC_B001.D\FID28.ch
October 21, 2021 9:36:18 AM	End	Execution	Noise and Drift - Back FID - Detector FID - L (Noise) <= 6.10 pA - L (Drift) <= 2.50 pA/hour	Run Count: 1
October 21, 2021 9:36:20 AM	Start	Execution	Injection Precision - Injection Tower, Back SSL, Back FID - GC - L (Area) <= 3.00% - L (Ret. Time) <= 1.00%	None
October 21, 2021 9:36:57 AM	Audit	Data	Injection Precision - Injection Tower, Back SSL, Back FID - GC - L (Area) <= 3.00% - L (Ret. Time) <= 1.00%	Data File Path: C:\Chem32\1\DATA\AQGPV20\21\OQPV2021_B 2021-10-20 17-13-45\INPREC_B002.D\FID28.ch
October 21, 2021 9:36:57 AM	Audit	Data	Injection Precision - Injection Tower, Back SSL, Back FID - GC - L (Area) <= 3.00% - L (Ret. Time) <= 1.00%	Data File Path: C:\Chem32\1\DATA\AQGPV20\21\OQPV2021_B 2021-10-20 17-13-45\INPREC_B003.D\FID28.ch
October 21, 2021 9:38:57 AM	Audit	Data	Injection Precision - Injection Tower, Back SSL, Back FID - GC - L (Area) <= 3.00% - L (Ret. Time) <= 1.00%	Data File Path: C:\Chem32\1\DATA\AQGPV20\21\OQPV2021_B 2021-10-20 17-13-45\INPREC_B004.D\FID28.ch
October 21, 2021 9:38:57 AM	Audit	Data	Injection Precision - Injection Tower, Back SSL, Back FID - GC - L (Area) <= 3.00% - L (Ret. Time) <= 1.00%	Data File Path: C:\Chem32\1\DATA\AQGPV20\21\OQPV2021_B 2021-10-20 17-13-45\INPREC_B005.D\FID28.ch

Page 9 / 10

Date: October 21, 2021 10:05:40 AM
System ID: GC-6

Page 21 / 22

User Name: kurya.thongkue
Host Name: ASBANK7015
System ID: GC-6
Print Date: October 21, 2021 10:05:40 AM

QC GC ALS CN11461066 Transaction log:

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
October 21, 2021 9:38:57 AM	Audit	Data	Injection Precision - Injection Tower, Back SSL, Back FID - GC - L (Area) <= 3.00% - L (Ret. Time) <= 1.00%	Data File Path: C:\Chem32\1\DATA\AQGPV20\21\OQPV2021_B 2021-10-20 17-13-45\INPREC_B006.D\FID28.ch
October 21, 2021 9:38:57 AM	Audit	Data	Injection Precision - Injection Tower, Back SSL, Back FID - GC - L (Area) <= 3.00% - L (Ret. Time) <= 1.00%	Data File Path: C:\Chem32\1\DATA\AQGPV20\21\OQPV2021_B 2021-10-20 17-13-45\INPREC_B007.D\FID28.ch
October 21, 2021 9:39:06 AM	End	Execution	Injection Precision - Injection Tower, Back SSL, Back FID - GC - L (Area) <= 3.00% - L (Ret. Time) <= 1.00%	Run Count: 1
October 21, 2021 9:39:11 AM	Start	Execution	Signal to Noise - Injection Tower, Back SSL, Back FID - Detector FID - L <= 300000	None
October 21, 2021 9:39:28 AM	Audit	Data	Signal to Noise - Injection Tower, Back SSL, Back FID - Detector FID - L <= 300000	Data File Path: C:\Chem32\1\DATA\AQGPV20\21\OQPV2021_B 2021-10-20 17-13-45\IGTIONS_B001.D\FID28.ch
October 21, 2021 9:39:36 AM	End	Execution	Signal to Noise - Injection Tower, Back SSL, Back FID - Detector FID - L <= 300000	Run Count: 1
October 21, 2021 9:39:43 AM	End	Qualification	Bleason	DQ
October 21, 2021 9:39:43 AM	Start	Reporting	Session	None
October 21, 2021 10:04:15 AM	Audit	Reporting	Session	Report Generated Certificate

Page 10 / 10

Date: October 21, 2021 10:05:40 AM
System ID: GC-6

Page 22 / 22



Southern Calibration Service Co., Ltd.

669/35 Kamjanavanit Rd., Banpru, Hatyai, Songkhla 90250 Thailand

Tel: 081 599 0417 Fax: 074 805 133 Email: s.calibration@gmail.com www.scal-lab.com



CALIBRATION CERTIFICATE

Issued Date : 12-Nov-2021

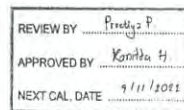
Certificate No. : 21EB1020

CSR No. : A01200583

Page : 1 of 3

Customer : ALS Laboratory Group (Thailand) Co., Ltd
114/1 Moo 8 Kamchanawanit Rd. T.Ban Pru,
A Hat Yai, Songkhla 90250 TH

Calibration Place : Chemical Laboratory
Instrument Name : Electronic Balance
Manufacturer : Sartorius
Model : MCE125P-2500-U
Serial No. : 0038105237
ID No. : SGK_CL0077
Resolution : 0.00001 g
Received Date : 9-Nov-2021
Calibrated Date : 9-Nov-2021
Ambient Temperature : (30 ± 10) °C
Relative Humidity : (50 ± 20) %



Calibration Method Used :

This instrument was calibrated using the Calibration In - house method : SCAL.WI.001 based on UKAS LAB 14 : 2015
The Southern Calibration Service Co., Ltd calibration control system complies with requirement of ISO/IEC 17025:2017

Traceability of measurement :

This Certificate is traceable to the International and/or national standards which realize the units of measurement according to the International System of Unit (SI) through :

- To : This Calibration Service Co., Ltd

Calibrated by : Innon Rattanayuan

Approved by :

Sakeerem Heemhad / Technical Manager

The uncertainty 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 Southern Calibration Service Co., Ltd.



Certificate No. : 21EB1020

CSR No. : A01200583

Page : 2 of 3

Details of Calibration

1. Reference Standard Equipment Used:

Equipment	Model	Serial No.	Cert. no.	Due Date
Standard Weight Set	2mg-2kg	11119514/01	M2107051S	6-Jul-2022

2. The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the longterm stability of instrument.

3. This certificate is not certified any commercial transaction

4. Condition of Item : normal condition , no indication for any damage or malfunction

Result of Calibration : (✓) Without Adjustment () After Adjustment

1. Repeatability

Nominal Value (g)	Standard Deviation (g)
120	0.000000

2. Effect of tare

Nominal Value (g)	Standard Value (g)	Balance Reading (g)	Correction (g)
12	12.00008	12.00000	0.00008
24	24.00000	24.00001	-0.00001
36	36.00014	36.00001	0.00013
48	48.00007	48.00001	0.00006
60	60.00004	60.00000	0.00004



Certificate No. : 21EB1020

CSR No. : A01200583

Page : 3 of 3

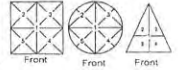
Result of Calibration :

3. Off-centre loading

A mass approximately 40g was placed on a pan and moved to various position

The balance reading obtained are given in the table:

Position					Maximum Difference (g)
1	2	3	4	5	
40.00018	40.00019	40.00018	40.00019	40.00020	0.00002



4. Departure from nominal value

Nominal Value (g)	Standard Value (g)	UUC Reading (g)	Correction (g)	Uncertainty (±g)	Coverage Factor (k)
0.01	0.01001	0.01000	0.00001	0.000024	2.0
0.05	0.05001	0.05001	0.00000	0.000024	2.0
0.1	0.10002	0.10001	0.00001	0.000024	2.0
0.5	0.50002	0.50002	0.00000	0.000024	2.0
1	1.00003	1.00003	0.00000	0.000024	2.0
2	2.00003	2.00003	0.00000	0.000024	2.0
5	5.00003	5.00004	-0.00001	0.000027	2.0
10	10.00004	10.00005	-0.00001	0.000033	2.0
20	20.00000	20.00008	-0.00008	0.000048	2.0
30	30.00005	30.00002	0.00003	0.000080	2.0
40	40.00006	40.00004	0.00002	0.000096	2.0
50	50.00000	50.00001	-0.00001	0.000078	2.0
60	60.00004	60.00001	0.00003	0.00011	2.0
70	70.00000	70.00001	-0.00001	0.00012	2.0
80	80.00005	80.00001	0.00003	0.00015	2.0
90	90.00006	90.00001	0.00005	0.00017	2.0
100	100.00000	100.00001	-0.00001	0.00014	2.0
110	110.00005	110.00001	0.00003	0.00024	2.0
120	120.00001	120.00001	-0.00001	0.00024	2.0

- UUC = Unit Under Calibration

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

...End...

BKK-FN0059



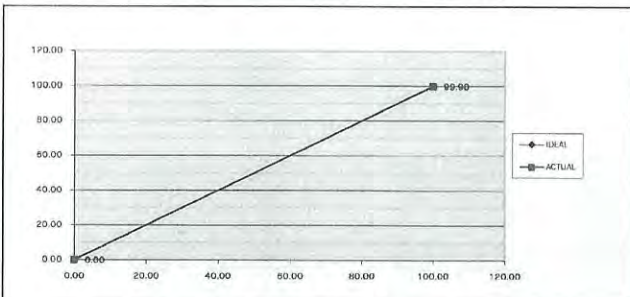
CALIBRATION REPORT

REVIEW BY: Suchat T.APPROVED BY: Somrat

CUSTOMER NAME :	ALS Laboratory Group (Thailand) Co., Ltd.
EQUIPMENT NAME :	Total Hydrocarbon Analyzer
MANUFACTURER :	Baseline
MODEL :	9000 NMHC
SERIAL NO :	0314DR0170
STANDARD GAS CONCENTRATION (PPM) :	100 PPM (Methane)
CYLINDER NO :	ND55981
CYLINDER PRESSURE (psig) :	800 PSI
CERTIFIED DATE :	12/02/2019
CERTIFIED BY :	AIRGAS
EXPIRED DATE :	12/02/2021

CALIBRATION RESULTS

POINT NO	CALIBRATION RESULTS			
	IDEAL	ACTUAL	ERROR	%ERROR
ZERO	0.00	0.00	0.00	-
1	100.00	99.90	-0.1	-0.10
AVERAGE (%)				0.02



CALIBRATED BY: jitwong DATE: 9/2/14

CHECKED BY: jitwong DATE: 9/2/14

สำหรับการสอบเทียบเครื่องมือวัด : แจ้งผลไปยังบริษัท ลูกค้าทราบ โทร 02-888-0812 # 31, E-Mail : Engineer@iranate.com

วันที่ 03/14-15/07/25-30 ตามเวลาประเทศไทย 7/7/14 และ 31/07/25-30 ตามเวลาประเทศไทย 7/7/14 โทร 02-888-0812-13 โทร 02-888-1089

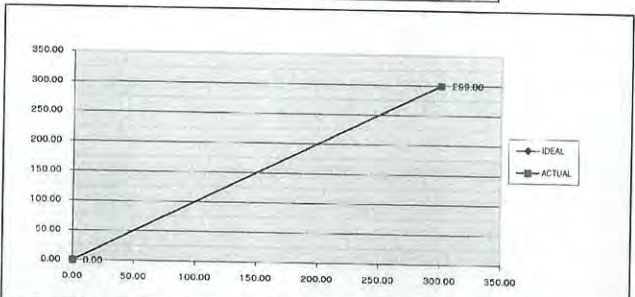


CALIBRATION REPORT

CUSTOMER NAME :	ALS Laboratory Group (Thailand) Co., Ltd.
EQUIPMENT NAME :	Total Hydrocarbon Analyzer
MANUFACTURER :	Baseline
MODEL :	9000 NMHC
SERIAL NO :	0314DR0170
STANDARD GAS CONCENTRATION (PPM) :	100 PPM (Propane)
CYLINDER NO :	ND55981
CYLINDER PRESSURE (psig) :	800 PSI
CERTIFIED DATE :	12/02/2019
CERTIFIED BY :	AIRGAS
EXPIRED DATE :	12/02/2021

CALIBRATION RESULTS

POINT NO	CALIBRATION RESULTS			
	IDEAL	ACTUAL	ERROR	%ERROR
ZERO	0.00	0.00	0.00	-
1	300.00	299.80	-0.2	-0.07
AVERAGE (%)				0.02



CALIBRATED BY: jitwong DATE: 9/2/14

CHECKED BY: jitwong DATE: 9/2/14

สำหรับการสอบเทียบเครื่องมือวัด : แจ้งผลไปยังบริษัท ลูกค้าทราบ โทร 02-888-0812 # 31, E-Mail : Engineer@iranate.com

วันที่ 03/14-15/07/25-30 ตามเวลาประเทศไทย 7/7/14 และ 31/07/25-30 ตามเวลาประเทศไทย 7/7/14 โทร 02-888-0812-13 โทร 02-888-1089



FLOW CALIBRATE

CUSTOMER NAME	ALS Laboratory Group (Thailand) Co., Ltd.		
EQUIPMENT NAME	Flow Calibrator		
MANUFACTURER	Bios	MODEL : 510 L	SERIAL NO : 129549

Flow Parameter	Step	Set	Display	Flow Meter
Sample	Before	40	38	38 cc/min
	After	40	30	39 cc/min
Air	Before	175	160	160 cc/min
	After	175	175	175 cc/min
Fuel	Before	35	32	32 cc/min
	After	35	34	34 cc/min

CALIBRATED BY :

CHECKED BY :



DATE : 9/8/21
9/2/21

สำหรับลูกค้าที่สนใจใช้บริการ กรุณาติดต่อฝ่ายขาย โทร 02-868-0812 หรือ 15-16 E-Mail : Eng@jiranatee.com
เลขที่ 63/14-15,67/35-36, Soi Petchkasem 7/1, Petchkasem Rd, Wathapra, Bangkokyai, Bangkok 10600 Thailand. Tel: (66) 02-8680812#13 Fax: (66) 02-8680860 www.jiranatee.com



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Wathapra, Bangkokyai, Bangkok 10600 Thailand.
Tel: (66) 02-8680812#13 Fax: (66) 02-8680860 www.jiranatee.com



CERTIFICATE OF CALIBRATION

Certificate No. : CL 004-64
Page 1 of 2

Equipment Name : Heat Stress Monitor with Sensor
Manufacturer : Delta OHM
Model : HD32.2
Serial No : 17011744
ID No : SGR_FS0008

Customer
Name : ALS laboratory group (thailand) Co., Ltd.
Address : 104 Phatthanakan 40, Phatthanakan
Rd., Khwaeng Suan Luang, Khet Suan Luang, Bangkok
10250 Thailand.

Received date : 6 AUG 2021
Calibration date : 16 AUG 2021
Issue date : 16 AUG 2021

Reference Used During Calibration
1. Standard Temperature Probe Model : STS 100 A500,
Serial No. : 667682-09, Due date : 25 Mar 2022
2. Digital Temperature Indicator Model : DTI 1000 A MK
II, Serial No. : 671407-00591 Due date : 04 June 2022

Calibration Condition
Temperature : (23±3) °C
Relative Humidity : (55±15)%

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-0036 21, Certificate number : ER-0032
21

REVIEW BY :
APPROVED BY :
NEXT CAL DATE : 16/8/22

Calibrated by

☐ Mr. Soravit Thachalee
☒ Miss Orathai Wiwatwattaya



Approved Signatory:

Mr. Parinya Booncharoen
Technical Support
And Calibration Manager

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Wathapra, Bangkokyai, Bangkok 10600 Thailand.
Tel: (66) 02-8680812#13 Fax: (66) 02-8680860 www.jiranatee.com



Certificate No. : CL 064-64
Page 2 of 2

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range: 20 °C - 40 °C

Function: Table 1: This equipment was connected with wet bulb probe Model: HP3201.2 S/N: 17015113.
Dimension : Diameter 14 mm, Length 170 mm

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
30	20.053	19.9	0.2	0.099
30	25.044	24.8	0.1	0.099
30	30.034	29.9	0.1	0.099
30	35.030	34.8	0.1	0.099
30	40.022	39.9	0.1	0.099

Table 2: This equipment was connected with temperature probe Model: TP3207.2 S/N: 17003391.
Dimension : Diameter 14 mm, Length 150 mm

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
70	20.054	20.2	0.1	0.099
70	24.863	24.8	0.1	0.099
70	29.819	29.7	0.1	0.099
70	34.772	34.5	0.3	0.099
70	39.700	39.3	0.4	0.099

Table 3: This equipment was connected with Globe thermometer probe Model: TP3276.2 S/N: 17015117.
Dimension : Diameter 8 mm, Length 170 mm

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.053	20.1	0.0	0.099
110	25.044	25.0	0.0	0.14
110	30.034	30.0	0.1	0.14
110	35.030	35.0	0.1	0.099
110	40.022	40.0	0.1	0.099

UUC* : Unit Under Calibration

The reported expanded uncertainty is based on standard uncertainty multiplied by a coverage factor k=2 providing a level of confidence of approximately 95%.

★ End of Certificate ★



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CERTIFICATE OF CALIBRATION

Certificate No. : CL 066-64
Page 1 of 2

Equipment Name : Heat Stress Monitor with Sensor
Manufacturer : Delta OHM
Model : HD32.2
Serial No : 18006680
ID No : SGR_FS0044

Customer
Name : ALS laboratory group (thailand) Co., Ltd.
Address : 104 Phatthanakan 40, Phatthanakan
Rd., Khwaeng Suan Luang, Khet Suan Luang, Bangkok
10250 Thailand.

Received date : 8 OCT 2021
Calibration date : 14 OCT 2021
Issue date : 14 OCT 2021

Reference Used During Calibration
1. Standard Temperature Probe Model : STS 100 A500,
Serial No. : 667682-09, Due date : 25 Mar 2022
2. Digital Temperature Indicator Model : DTI 1000 A MK
II, Serial No. : 671407-00591 Due date : 04 June 2022

Calibration Condition
Temperature : (23±3) °C
Relative Humidity : (55±15)%

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-0036 21, Certificate number : ER-0032
21

REVIEW BY :
APPROVED BY :
NEXT CAL DATE : 14/10/22

Calibrated by

☒ Mr. Soravit Thachalee
☒ Miss Orathai Wiwatwattaya



Approved Signatory:

Mr. Parinya Booncharoen
Technical Support
And Calibration Manager

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Certificate No.: CL-085-64
Page 2 of 2

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range: 20 °C - 40 °C

Function:

Table 1: This equipment was connected with wet bulb probe Model: HP3201.2 S/N. 18007974.
Dimension: Diameter 14 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
30	20.029	20.2	0.1	0.099
30	25.052	25.2	0.1	0.099
30	30.046	30.2	0.2	0.099
30	35.042	35.2	0.2	0.099
30	40.029	40.2	0.2	0.099

Table 2: This equipment was connected with temperature probe Model: TP3207.2 S/N. 18003404.
Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
70	20.055	20.1	0.05	0.099
70	24.896	24.8	0.1	0.099
70	29.835	29.7	0.1	0.099
70	34.794	34.5	0.3	0.099
70	39.705	39.4	0.4	0.099

Table 3: This equipment was connected with Globe thermometer probe Model: IP3276.2 S/N. 18009543.
Dimension: Diameter 8 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.060	20.1	0.04	0.099
110	25.052	25.1	0.05	0.099
110	30.047	30.1	0.05	0.099
110	35.062	35.1	0.1	0.099
110	40.029	40.1	0.1	0.099

UUC* Unit Under Calibration

The reported expanded uncertainty is based on standard uncertainty multiplied by a coverage factor k=2 providing a level of confidence of approximately 95%.

★ End of Certificate ★



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CERTIFICATE OF CALIBRATION

Certificate No.: CL-065-64
Page 1 of 2

Equipment Name: Heat Stress Monitor with Sensor
Manufacturer: Delta OHM
Model: HD32.2
Serial No: 17011746
ID No: SGK_FS0009

Customer:
Name: ALS laboratory group (thailand) Co., Ltd.
Address: 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Suan Luang, Khet Suan Luang, Bangkok 10250 Thailand.

Received date: 6 AUG 2021
Calibration date: 17 AUG 2021
Issue date: 17 AUG 2021

Reference Used During Calibration

1. Standard Temperature Probe Model: STS 100 A500, Serial No.: 661682-09 Due date: 25 Mar 2022
2. Digital Temperature Indicator Model: DTI-1000-A MK II, Serial No.: 671407-00591 Due date: 04 June 2022

Calibration Condition

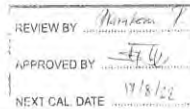
Temperature: (23±3) °C
Relative Humidity: (55±15)%

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-003621. Certificate number: ER-003221.



Calibrated by
☒ Mr. Sorawit Thachaiad
☒ Miss Orathai Wivattayana



Approved Signatory:
Mr. Parinya Booncharoen
Technical Support
and Calibration Manager

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Certificate No.: CL-065-64
Page 2 of 2

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment

Calibration Range: 20 °C - 40 °C

Function:

Table 1: This equipment was connected with wet bulb probe Model: HP3201.2 S/N. 17011157.
Dimension: Diameter 14 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
30	20.034	19.9	0.1	0.099
30	25.042	24.9	0.1	0.099
30	30.031	29.9	0.1	0.099
30	35.030	34.9	0.1	0.099
30	40.021	39.9	0.1	0.099

Table 2: This equipment was connected with temperature probe Model: TP3207.2 S/N. 17009116.
Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
70	20.049	20.0	0.0	0.099
70	25.043	24.7	0.3	0.099
70	29.815	29.6	0.2	0.099
70	34.760	34.5	0.3	0.099
70	39.720	39.4	0.3	0.099

Table 3: This equipment was connected with Globe thermometer probe Model: TP3276.2 S/N. 17015116.
Dimension: Diameter 8 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.034	20.0	0.0	0.099
110	25.042	25.0	0.0	0.099
110	30.031	30.0	0.0	0.099
110	35.030	35.0	0.0	0.099
110	40.021	40.0	0.0	0.099

UUC* Unit Under Calibration

The reported expanded uncertainty is based on standard uncertainty multiplied by a coverage factor k=2 providing a level of confidence of approximately 95%.

★ End of Certificate ★



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Tel: (66) 02-8680812#13 Fax: (66) 02-8680860 www.jiranatee.com



CERTIFICATE OF CALIBRATION

Certificate No.: CL-063-64
Page 1 of 2

Equipment Name: Heat Stress Monitor with Sensor
Manufacturer: Delta OHM
Model: HD32.2
Serial No: 18006673
ID No: SGK_FS0041

Customer:
Name: ALS laboratory group (thailand) Co., Ltd.
Address: 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Suan Luang, Khet Suan Luang, Bangkok 10250 Thailand.

Received date: 8 OCT 2021
Calibration date: 12 OCT 2021
Issue date: 14 OCT 2021

Reference Used During Calibration

1. Standard Temperature Probe Model: STS 100 A500, Serial No.: 661682-09 Due date: 25 Mar 2022
2. Digital Temperature Indicator Model: DTI-1000-A MK II, Serial No.: 671407-00591 Due date: 04 June 2022

Calibration Condition

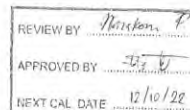
Temperature: (23±3) °C
Relative Humidity: (55±15)%

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-003621. Certificate number: ER-003221.



Calibrated by
☒ Mr. Sorawit Thachaiad
☒ Miss Orathai Wivattayana



Approved Signatory:
Mr. Parinya Booncharoen
Technical Support
and Calibration Manager

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Tel: (66) 02-8680812#13 Fax: (66) 02-8680860 www.jiranalee.com



Certificate No.: CL 063 64
Page 2 of 2

Result of Calibration: ☒ Without Adjustment ☐ With Adjustment
Calibration Range: 20 °C - 40 °C
Function:

Table 1: This equipment was connected with wet bulb probe Model: HP3201 2 S/N: 18005278.
Dimension: Diameter 14 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
30	20.056	20.1	0.0	0.059
30	25.046	25.1	0.1	0.059
30	30.037	30.1	0.1	0.059
30	35.034	35.1	0.1	0.059
30	40.026	40.0	0.0	0.059

Table 2: This equipment was connected with temperature probe Model: TP3207 2 S/N: 18007693.
Dimension: Diameter 14 mm. Length 150 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
70	20.055	20.2	0.1	0.059
70	24.992	24.9	0.0	0.059
70	29.859	29.8	0.1	0.059
70	34.818	34.7	0.1	0.059
70	39.781	39.6	0.2	0.059

Table 3: This equipment was connected with Globe thermometer probe Model: TP3276 2 S/N: 18009546.
Dimension: Diameter 8 mm. Length 170 mm.

Immersion Depth (mm)	Standard Reading (°C)	UUC Reading (°C)	Error (°C)	Uncertainty (°C)
110	20.055	20.0	0.1	0.059
110	25.048	25.0	0.0	0.059
110	30.039	30.0	0.0	0.059
110	35.034	35.0	0.0	0.059
110	40.025	40.0	0.0	0.059

UUC* = Unit Under Calibration

The reported expanded uncertainty is based on standard uncertainty multiplied by a coverage factor $k=2$ providing a level of confidence of approximately 95%.

★ End of Certificate ★



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG, BANGKOK 10250
TEL: 0-2717-3000-34 FAX: 0-2715-9444



Certificate of Calibration

Certificate No.: 21PH447
Page: 1 of 2

Equipment: Lux Meter
Manufacturer: Delta OHM
Model: HD 2102.2
Serial No.: 17005888
ID No.: SGK_F80012
Condition As-Received: Used Item
Received Date: 25 August 2021
Calibration Date: 14 September 2021

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Reference: 2108-0761WSC Submitted by: ALS Laboratory Group (Thailand) Co., Ltd.
Ambient Temperature: (23 ± 2) °C
Relative Humidity: (50 ± 15) %

104 Phatthakan 40, Phatthakan Rd,
Khwaeng Phatthakan, Khet Suan Luang,
Bangkok 10250 Thailand

Procedure used: Calibration were conducted using In-house calibration procedure CP-PH01 by measuring against luminous-intensity standard lamp (source-based method) According to the inverse square law measurement method.

Condition of this result of calibration

1. Reference standards instruments:

Instrument	Model	Serial No.	Certificate No.	Due Date
1) Photometry & Encoder	LMguide 9.6 m	120RC003	61-140006-1	30 Apr 2022
2) High-accuracy Irradiance Standard	OL-FELU	F-1472	TP-1045-20	20 Oct 2021

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: 09220284).

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 at-

-National Institute of Metrology (NIMT)

REVIEW BY	<i>Natthakorn P.</i>
APPROVED BY	<i>Ch. L.</i>
NEXT CAL DATE	14/9/22

Calibrated by: Nuntawat Khamchai
Issue Date: 18 September 2021

Approved Signatory: *Ch. L.*
| Phalinee Prabpaiak
| Chatchawan Khunpikul

B 0269821



Cert. No.: 21PH447
Page: 2 of 2

Result of calibration: (*) Without adjustment () After adjustment
Function: Illuminance Measurement Range: Aulorange

Standard Value (lx)	UUC* Reading (lx)	Error (lx)	Uncertainty (± lx)
0	0.00	0.00	0.060
15	15.00	0.00	0.20
100	100.01	0.01	1.3
500	500.0	0.0	6.5
1000	1001.4	1.4	13
2000	2004	4	26
3000	3004	4	39
4000	4000	0	52
5000	5001	1	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 %

Calibration with probe sensor s/n. 17014097

UUC* = Unit Under Calibration.

-000-

SITHIPORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

451-451/1 Sirinthorn Rd, Bangbunru, Bangplud Bangkok 10700 THAILAND
Tel:0-2435-8800 Fax:0-2433-1679 e-mail:center@sithiporn.com http://www.sithiporn.com



Cert. No.: ACL21105
Pages: 1 of 8

Calibration Certificate

Equipment: SOUND LEVEL METER
Manufacturer: RION
Model: NL-42/ Microphone UC-52 / Preamplifier NH-24
Serial No.: 01000341 / 188644 / 02004
ID No.:

Condition As Found: GOOD

Customer: ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHAKAN 40, PHATTHAKAN ROAD,
KHWAENG PHATTHAKAN, 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: 31 AUGUST 2021
Calibration Date: 16-17 SEPTEMBER 2021
Date of Issue: 20 SEPTEMBER 2021

REVIEW BY	<i>Natthakorn P.</i>
APPROVED BY	<i>Ch. L.</i>
NEXT CAL DATE	16/9/22

Calibrated by: Natthakorn 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.

QT-TS12-01-04 020664

a 1071785

Continuation of Calibration Certificate

Cert. No. : ACL21105
Job No. : VC64AC0064
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by based 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-0012-21	10-Feb-22
Waveform Generator	33511B	MY52302742	EF-0011-21	10-Feb-22
Digital Multimeter	33461A	MY53220104	EEL_BP_05/0264	10-Feb-22
Digital Multimeter	33461A	MY53220076	EEL_BP_03/0264	08-Feb-22
Digital Multimeter	8846A	1997025	EEL_BP_06/0264	05-Feb-22
Programmable Attenuator	MAT-1070	62100114	1500-07774E	08-Mar-22
Condenser Microphone	4180	2977900	AA-1008-21	05-Feb-22
Measuring Amplifier	NA-42KA1	34560495	AA-3003-21	16-Feb-22

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).

QF-TS12-04-04-020664

Continuation of Calibration Certificate

Cert. No. : ACL21105
Job No. : VC64AC0064
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Pass	Fail	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	-	-	-	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

QF-TS12-04-04-020664

Continuation of Calibration Certificate

Cert. No. : ACL21105
Job No. : VC64AC0064
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.96)	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	Measured value (dB)
A - weight	12.6
C - weight	18.4
Flat	23.9

3. Acoustical signal tests of frequency weightings

Meter free-field acoustic response at a level of 84 dB

Frequency (Hz)	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.1	0.1	0.1	± 1.5
1000	0.0	0.0	-0.1	± 1.0
8000	0.4	0.5	0.5	± 5.0

QF-TS12-04-04-020664

Continuation of Calibration Certificate

Cert. No. : ACL21105
Job No. : VC64AC0064
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	-0.1	±2.0
125	0.0	0.0	0.0	±1.5
250	0.0	0.0	0.0	±1.5
500	0.0	0.1	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	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	0.0	-
C - weight	94.0	0.0	± 0.2
Flat	94.0	0.0	± 0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	0.0	-
Slow	94.0	0.0	± 0.1
Lcq	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

QF-TS12-04-04-020664

Continuation of Calibration Certificate

Cert. No. : ACL21105
Job No. : VC64AC0064
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	±1.1
136.0	136.0	0.0	±1.1
135.0	135.0	0.0	±1.1
134.0	134.0	0.0	±1.1
133.0	133.0	0.0	±1.1
132.0	132.0	0.0	±1.1
131.0	131.0	0.0	±1.1
129.0	129.0	0.0	±1.1
124.0	124.0	0.0	±1.1
119.0	119.0	0.0	±1.1
114.0	114.0	0.0	±1.1
109.0	109.0	0.0	±1.1
104.0	104.0	0.0	±1.1
99.0	99.0	0.0	±1.1
94.0	94.0	0.0	±1.1
89.0	89.0	0.0	±1.1
84.0	84.0	0.0	±1.1
79.0	79.0	0.0	±1.1
74.0	74.0	0.0	±1.1
69.0	69.0	0.0	±1.1
64.0	64.0	0.0	±1.1
59.0	59.0	0.0	±1.1
54.0	54.0	0.0	±1.1
49.0	49.0	0.0	±1.1
44.0	44.0	0.0	±1.1
39.0	39.0	0.0	±1.1
34.0	34.0	0.0	±1.1
30.0	30.0	0.0	±1.1
29.0	29.1	0.1	±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

QF-TS12-04-04-020664

T. Petchur

Continuation of Calibration Certificate

Cert. No. : ACL21105
Job No. : VC64AC0064
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)
Auto	94.0	94.0	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

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L _{peak} (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	-
One	136.4	135.6	-0.8	±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	-
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

QF-TS12-04-04-020664

T. Petchur

Continuation of Calibration Certificate

Cert. No. : ACL21105
Job No. : VC64AC0064
Pages : 8 of 8

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

QF-TS12-04-04-020664

T. Petchur

451-451/1 Sirinthon Rd, Bangbunru, Banglud Bangkok 10700 THAILAND
Tel:0-2435-8800 Fax:0-2433-1679 e-mail:cal-center@sithiporn.com http://www.sithiporn.comCert. No. : ACL21104
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : RION
Model : NL-42/ Microphone UC-52 / Preamplifier NH-24
Serial No. : 01000340 / 188643 / 02003
ID No. : -

Condition As Found : GOOD

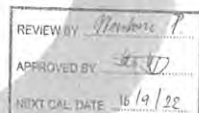
Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,
KHWAENG PHATTHANAKAN, KHET SUAN LUANG
BANGKOK, 10250 THAILAND.

Location : -
Ambient Temperature : (23.0 ± 3) °C
Pressure : (101.3 ± 3) kPa
Relative Humidity : (50.0 ± 20) %

Received Date : 31 AUGUST 2021
Calibration Date : 16-17 SEPTEMBER 2021
Date of Issue : 20 SEPTEMBER 2021

Calibrated by : Nathakorn Pisutpaisan

Approved by : T. Petchur
(Thanakul Petchurai)



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QF-TS12-04-04-020664

Continuation of Calibration Certificate

Cert. No. : ACL21104
Job No. : VC64AC0064
Pages : 2 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by based 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 Anéchoic 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-0012-21	10-Feb-22
Waveform Generator	33511B	MY52302742	EF-0011-21	10-Feb-22
Digital Multimeter	33461A	MY53220104	EEL.BP. 03/0264	10-Feb-22
Digital Multimeter	33461A	MY53220076	EEL.BP. 03/0264	08-Feb-22
Digital Multimeter	8846A	1997025	EEL.BP. 06/0264	05-Feb-22
Programmable Attenuator	MAT-1070	62100114	1500-07774E	08-Mar-22
Condenser Microphone	4180	2977900	AA-1008-21	05-Feb-22
Measuring Amplifier	NA-42KA1	34560495	AA-3003-21	16-Feb-22

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).

QF-TS12-04-04-020664

S. Petch

Continuation of Calibration Certificate

Cert. No. : ACL21104
Job No. : VC64AC0064
Pages : 3 of 8

Summary of Measurement Result :

Parameter	Pass	Fail	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	-	-	-	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

QF-TS12-04-04-020664

S. Petch

Continuation of Calibration Certificate

Cert. No. : ACL21104
Job No. : VC64AC0064
Pages : 4 of 8

Result of calibration :

1. Absolute sensitivity

Reference Acoustic Signal (dB)	Measured Value (dB)	Deviation (dB)	Acceptance Limit (dB)
93.9 (93.96)	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	Measured value (dB)
A - weight	12.0
C - weight	18.1
Flat	23.7

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	0.1	0.2	0.2	± 1.5
1000	0.0	0.0	0.0	± 1.0
8000	0.2	0.3	0.3	±5.0

QF-TS12-04-04-020664

S. Petch

Continuation of Calibration Certificate

Cert. No. : ACL21104
Job No. : VC64AC0064
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	-0.2	-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	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
A - weight	94.0	0.0	-
C - weight	94.0	0.0	±0.2
Flat	94.0	0.0	±0.2

5.2 Time weighting at 1 kHz

Frequency Weighting	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	94.0	0.0	-
Slow	94.0	0.0	±0.1
Leq	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

QF-TS12-04-04-020664

S. Petch

Continuation of Calibration Certificate

Cert. No. : ACL21104
Job No. : VC64AC0064
Pages : 6 of 8

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
137.0	137.0	0.0	± 1.1
136.0	136.0	0.0	± 1.1
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 1.1
133.0	133.0	0.0	± 1.1
132.0	132.0	0.0	± 1.1
131.0	131.0	0.0	± 1.1
129.0	129.0	0.0	± 1.1
124.0	124.0	0.0	± 1.1
119.0	119.0	0.0	± 1.1
114.0	114.0	0.0	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.0	0.0	± 1.1
99.0	99.0	0.0	± 1.1
94.0	94.0	0.0	± 1.1
89.0	89.0	0.0	± 1.1
84.0	84.0	0.0	± 1.1
79.0	79.0	0.0	± 1.1
74.0	74.0	0.0	± 1.1
69.0	69.0	0.0	± 1.1
64.0	64.0	0.0	± 1.1
59.0	59.0	0.0	± 1.1
54.0	54.0	0.0	± 1.1
49.0	49.0	0.0	± 1.1
44.0	44.0	0.0	± 1.1
39.0	39.0	0.0	± 1.1
34.0	34.0	0.0	± 1.1
30.0	30.1	0.1	± 1.1
29.0	29.1	0.1	± 1.1
28.0	28.1	0.1	± 1.1
27.0	27.1	0.1	± 1.1
26.0	26.2	0.2	± 1.1
25.0	25.2	0.2	± 1.1

QF-TS12-04-04-020664

T. R. R. R.

Continuation of Calibration Certificate

Cert. No. : ACL21104
Job No. : VC64AC0064
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)
Auto	94.0	94.0	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

10. Peak C sound level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, L _{peak} (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	-
One	136.4	135.4	-1.0	±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	-
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.1	-0.3	±2.0

QF-TS12-04-04-020664

T. R. R. R.

Continuation of Calibration Certificate

Cert. No. : ACL21104
Job No. : VC64AC0064
Pages : 8 of 8

11. Overload indication

Measured value (dB)		Deviated Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	Negative one-half cycle	0.1	±1.5
89.5	89.6		

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

QF-TS12-04-04-020664

T. R. R. R.

CERTIFICATE OF CALIBRATION

ISSUED BY Cirrus Research plc

DATE OF ISSUE 24/01/22

CERTIFICATE NUMBER 168891

REVIEW BY: *Monique P.*
APPROVED BY: *Rebecca Thomas*
EFFECTIVE DATE: 24/1/23

Cirrus Research plc
Acoustic House
Bridlington Road
Hunnamby
North Yorkshire
YO14 0PH
United Kingdom

Page 1 of 1
Test engineer:
Rebecca Thomas
Electronically signed:
R. Thomas

doseBadge Reader

Instrument

Manufacturer: Cirrus Research plc
Model Number: RC110ASerial Number: 79623
Notes: *1.5 mPa*

Calibration Procedure

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

Date of Calibration: 24 January 2022

Functionality Results

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

Calibration Results

	Level (dB)	Frequency (Hz)	Distortion (% THD + Noise)
Initial	114.08	999.2	0.25
Adjusted	114.00	999.2	0.23
Uncertainty	± 0.11	± 0.14	± 0.10
Tolerances	± 0.60	± 2.00	± 4.00

Environmental Conditions

Pressure: 102.43 kPa
Temperature: 23.0 °C
Humidity: 33.3 %

Notes

This certificate provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory. The results within this certificate relate only to the items calibrated. The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a coverage probability of approximately 95%.



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-3000-27 FAX. 0-2719-9444



Cert. No.: 21TM331
Page.: 1 of 3

Certificate of Calibration

Equipment : Incubator
Manufacturer : Memmert
Model : ICP 750
Serial No. : F816.0063
ID No. : SGK_CL0028
Submitted by : ALS Laboratory Group (Thailand) Co., Ltd. Songkhla Branch
114/1 Moo 8 Kanjanavanij Rd.,
Banphru, Hatyai,
Songkhla 90250 Thailand
Location : BOD Room
Received Order : 10 February 2021
Calibration Date : 11 February 2021
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %
Calibrated by : Khiti Rutanaprapachai
Approved by :
() Pornthippa Tamayakul
() Malee Bulkruea
() Suwit Imjai
Issue Date : 19 February 2021

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

A 0024671



Equipment : Incubator
Condition As-Received : Used Item
Reference : 2102-0248OC-3

Cert. No.: 21TM331
Page.: 2 of 3

Procedure Used :-

Calibration were conducted using calibration procedure CP-OT02 according to direct measurement method with Data Acquisition which connected with Resistance Temperature Detector (RTD).
The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument	Serial No.	Cert. No.	Traceable	Due Date
1) Data Acquisition	MY48023932	20LM8	NIST, NIMT	20 Apr 2021

2. This certification is traceable to the SI unit.

3. This certificate is valid only to the item calibrated on date and place of calibration.

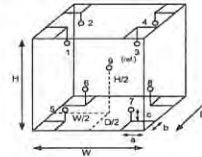
Remark : NIST : National Institute of Standards and Technology, The United State of America.

NIMT : National Institute of Metrology Thailand.

Result of Calibration :- (*) Without Adjustment

Function of UUC* : Temperature Source

Fresh air setting : Not Available



Probe Installation Details :

a = 10 cm
b = 10 cm
c = 10 cm

Dimension of Chamber :

D = 0.60 m
W = 1.0 m
H = 1.2 m
Capacity = 0.72 m³

Environment during calibration		
	Beginning	Finished
Temp. (°C)	21	22
REL Humid. (%)	46	48
AC Supply (Volt)	220	221

Position :	Ref. Std./ID No.:
1	20-16RTD-01
2	20-16RTD-02
3	20-16RTD-03
4	20-16RTD-04
5	20-16RTD-05
6	20-16RTD-06
7	20-16RTD-07
8	20-16RTD-08
9 (ref.)	20-16RTD-09

a 1041642



Equipment : Incubator
Condition As-Received : Used Item
Reference : 2102-0248OC-3
Result of Calibration :- (*) Without Adjustment
Function of UUC* : Temperature Source

Cert. No.: 21TM331
Page.: 3 of 3

Calibration Point (°C)	UUC* Setting (°C)	UUC* Reading (°C)	Temperature stability (± °C)	Temperature uniformity (°C)	Overall Variation (°C)	Uncertainty (± °C)	Coverage Factor k
20.0	20.0	20.0	0.10	0.32	0.62	0.30	2

Calibration Point (°C)	Measured Temperature (°C)								
	1	2	3	4	5	6	7	8	9 (ref.)
20.0	20.294	20.186	20.327	20.313	20.058	20.105	20.008	19.863	20.109

Average* : The average of 30 values in each position.

Temperature stability : One-half of the greatest maximum difference of measured temperature at any one sensor.
Temperature uniformity : The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time or at as close an observation time as possible to determine the temperature pattern or homogeneity within the chamber under steady-state conditions.

Overall Variation : The Difference of the maximum and minimum measured temperatures throughout observation.

UUC* : Unit Under Calibration

Note : The reported uncertainty of measurement was included stability and excluded uniformity.

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

-000-

a 1041641



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-3000 FAX. 0-2719-9444

Cert.No.: 21TW256
Page.: 1 of 2

Certificate of Testing

Equipment : DO Meter
Manufacturer : YSI
Model : 5000
Serial No. : 17B101473
ID No. : SGK_CL0073
Received Date : 01 December 2021
Test Date : 02 December 2021
Reference : 2112-0025DSC-1
Submitted by : ALS Laboratory Group (Thailand) Co., Ltd.
Songkhla Branch.
114/1 Moo 8 Kanchanawanich Rd., T.Ban Phru,
A.Hat Yai, Songkhla 90250 Thailand
Laboratory Condition : Temperature (25 ± 5) °C
Humidity (50 ± 20) %
Test Procedure : In - house method : CP-CHS
by Comparison Technique with Azide Modification Method
Tested by : Walalak Sirithean
Approved by :
(/) Malee Bulkruea
() Saitip Meangmai
() Warakorn Lenggrakul
Issue Date : 6 December 2021

REVIEW BY
APPROVED BY
NEXT CAL. DATE : 1/15/2022

B 0276229



Cert.No.: 21TW256
Page.: 2 of 2

Result : Dissolved Oxygen Meter Adjustment With Air 100 %
Dissolved Oxygen Probe No.: 17B100103

Titration Method (Azide Modification Method) (mg/L)	DO Meter Reading (mg/L)	Standard Deviation (mg/L)
8.12	8.11	0.0055

This report was certified only for the instrument we tested. It is allowable to use for study the system efficiency. The environmental impact control and present to organization it may concerned intend to use for advertising and referral purpose is prohibited. This report may not be reproduced other in full, without written approval of the laboratory.

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a 1084082



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
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534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL.: 0-2717-3005-27 FAX: 0-2710-9454



Cert. No.: 21LM26
Page.: 1 of 2

Certificate of Calibration

Equipment : DO Meter with Sensor
Manufacturer : YSI
Model : 5000
Serial No. : 17B101473
ID No. : SGK_CL0073
Submitted by : ALS Laboratory Group (Thailand) Co., Ltd. Songkhla Branch
114/1 Moo 8 Kamchanawanich Rd.,
T. Ban Phur, A. Hat Yai,
Songkhla 90250 Thailand
Location : On Site Calibration Service Laboratory
Received Order : 1 December 2021
Calibrated Date : 6 December 2021
Ambient Temperature : (26 ± 10) °C
Relative Humidity : (50 ± 30) %
AC Line Voltage : (220 ± 22) V
Calibrated by : Man Pattanapongpalboon
Approved by :
() Pornthippa Tameysakul
(x) Malee Butkrua
() Suwit Imjai
Issue Date : 9 December 2021

The Uncertainties are for a confidence probability of approximately 95%

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A 0032821



Equipment : DO Meter with Sensor
Condition As-Received : Used Item
Reference : 2112-0025DSC-1

Cert. No.: 21LM26
Page.: 2 of 2

Procedure Used :-

Calibration were conducted using in-house calibration procedure CP-OT01 according to comparison with Industrial Platinum Resistance Thermometer (IPRT) into Temperature Bath.

The temperature scale used was based on ITS-90.

Condition of this result of calibration

1. Reference standard instrument:-

Instrument	Model	Serial No.	Cert. No.	Due Date
1) Digital Thermometer	1502A	A52847	21H1144	20 Oct 2022

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.

Result of Calibration :- (*) Without Adjustment

Function : Temperature measurement.

This instrument was connected with temperature sensor, S/N.: 17B100103

Calibration Point (°C)	Immersion Depth (mm)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty (± °C)	Coverage Factor k
20.00	60	20.001	19.98	-0.041	0.15	2.00

UUC* : Unit Under Calibration

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

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a 1085890



PENTA
CALIBRATION

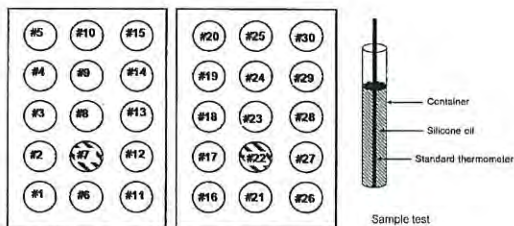
PENTA CALIBRATION CO., LTD.
66/124 The Connect 33 Village Kanchanaphisek Road
Dokmai Prawat Bangkok 10250
Tel: +66 (0) 2065-8773
www.pentacal.com

Certificate of Calibration

Certificate No.: PTC/10/22004 **Page:** 1 of 4
Equipment: Cod Reactor **Condition:** New
Manufacturer: Hach **Serial No.:** 2112001313
Model: DRB200 **ID No.:** -
Covers: None **Holes:** 30
Environment Condition: Temperature: 25.2 °C ± 0.1 °C
Humidity: 49.5 %RH ± 1.1 %RH
Voltage: 221.8 VAC ± 0.6 VAC
Customer: ALS LABORATORY GROUP (THAILAND)
114/1 Moo.8, Kamchanawanich Rd., T. Ban Phru,
A. Hat Yai, Songkhla 90250 Thailand.
Calibration Place: Penta Calibration Co., Ltd. (Temperature Laboratory)
66/124 The connect 34 Village, Kanchanaphisek Road,
Dokmai, Prawat Bangkok 10250 Thailand
The Method used: In house method, PTC-WI-10, based on Compare with Standard Thermometer
Traceability: This certificate is traceable to the SI Units through Quality Reborn Co., Ltd.,
NSC-ONSAC Accreditation No.: Calibration 0292
Date Received: February 08, 2022
Date Calibrated: February 08, 2022
Date Issued: February 08, 2022
Calibrated By: Mr. Todsapol Moolsuang

(Mr. Kiangsak Kalasin)
Reviewed by

(Mr. Keattisak Kerdto)
Laboratory Manager


Standard Installation Position:

Module	1									
Position of Std	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10
Probe No.	1	2	3	4	5	6	7	8	9	10

Module	2									
Position of Std	#11	#12	#13	#14	#15	#16	#17	#18	#19	#20
Probe No.	1	2	3	4	5	6	7	8	9	10

Module	2									
Position of Std	#21	#22	#23	#24	#25	#26	#27	#28	#29	#30
Probe No.	1	2	3	4	5	6	7	8	9	10

This certificate is issued the units of measurement according to the International System of Units (SI). It provides traceability of measurement to international or national standard or other recognised national standard laboratories.

The measurement uncertainty stated is the expanded uncertainty which is obtained from the standard uncertainty multiplied by the coverage factor ($k=2$) to provide a level of confidence of approximately 95%. It is determined in accordance with the Guide to Expression of Uncertainty in Measurement (GUM). The effect that the results relate only to the items calibrated.

This calibration certificate shall not be reproduced except in full only, without written approval from penta calibration co., ltd.

PTC-FM-C10-01-19 DEC 2017

Measurement Results:
Without adjustment

Position heating block	Calibration point (°C)	Setting (°C)	UUC Reading (°C)
Left	150	150	150

Measurement Temperature (°C) @ Probe No.			
Position	Standard Reading (°C)	Correction of UUC. (°C)	Uncertainty (± °C)
#1	150.77	0.77	0.64
#2	149.49	-0.51	0.63
#3	150.38	0.38	0.63
#4	150.28	0.28	0.63
#5	149.74	-0.26	0.63
#6	150.94	0.94	0.64
#7	149.01	-0.99	0.64
#8	150.82	0.82	0.64
#9	149.49	-0.51	0.63
#10	149.11	-0.89	0.63
#11	149.31	-0.69	0.64
#12	150.73	0.73	0.64
#13	150.48	0.48	0.64
#14	149.13	-0.87	0.63
#15	149.19	-0.81	0.64

UUC Characterization

UUC Setting (°C)	UUC Reading (°C)	Measured Uniformity (°C)	Measured Stability (± °C)
150	150	1.55	0.12

Note: UUC = Unit Under Calibration

Definitions

UUC Reading: The average reading of indicating device which forms the integral part of UUC.

Standard Reading: The average reading of standards at any positions or location.

Measured Uniformity: The maximum difference of measured temperatures between of any probes and the measured temperature at the reference location which are observed at same time or at close observation time as possible to determine the temperature pattern or homogeneity with any holes of UUC at steady-state. The reference probe is preferably located in the geometric center of UUC.

Measured Stability: The one-half of greatest maximum difference of measured temperatures at any one probe.

PTC-FM-C10-01-19 DEC 2017

Measurement Results:
Without adjustment

Position heating block	Calibration point (°C)	Setting (°C)	UUC Reading (°C)
Right	150	150	150

Measurement Temperature (°C) @ Probe No.			
Position	Standard Reading (°C)	Correction of UUC. (°C)	Uncertainty (± °C)
#16	149.46	-0.54	0.64
#17	149.79	-0.21	0.64
#18	149.27	-0.73	0.64
#19	150.14	0.14	0.64
#20	149.38	-0.62	0.64
#21	150.81	0.81	0.64
#22	150.80	0.80	0.65
#23	150.71	0.71	0.64
#24	149.86	-0.14	0.64
#25	149.23	-0.77	0.64
#26	150.61	0.61	0.64
#27	149.10	-0.90	0.64
#28	150.71	0.71	0.64
#29	149.10	-0.90	0.64
#30	150.74	0.74	0.64

UUC Characterization

UUC Setting (°C)	UUC Reading (°C)	Measured Uniformity (°C)	Measured Stability (± °C)
150	150	1.55	0.12

Note: UUC = Unit Under Calibration

Definitions

UUC Reading: The average reading of indicating device which forms the integral part of UUC.

Standard Reading: The average reading of standards at any positions or location.

Measured Uniformity: The maximum difference of measured temperatures between of any probes and the measured temperature at the reference location which are observed at same time or at close observation time as possible to determine the temperature pattern or homogeneity with any holes of UUC at steady-state. The reference probe is preferably located in the geometric center of UUC.

Measured Stability: The one-half of greatest maximum difference of measured temperatures at any one probe.

The End of Certificate

PTC-FM-C10-01-19 DEC 2020



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
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 534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
 TEL: 0-2717-3000-27 FAX: 0-2710-6484



Cert.No.: 22CHO32
 Page: 1 of 3

Certificate of Calibration

Equipment: UV-VIS Spectrophotometer
Manufacturer: Hach
Model: DR 3900
Serial No.: 1687645
ID No.: SGK_CL0038
Condition As-Received: Used Item
Received Date: 24 January 2022
Calibration Date: 24 January 2022
Reference: 2201-0517OC-1
Submitted by: ALS Laboratory Group (Thailand) Co., Ltd.
 Songkhla Branch
 114/1 Moo 8, Kanjanavanij Rd., Banphru, Hatyai,
 Songkhla 90250, Thailand
Calibration Place: Chemistry Room
Ambient Temperature: (24.9 - 25.2) °C (On-Site)
Relative Humidity: (39.2 - 45.2) % (On-Site)
Calibration Procedure: In-house method :
 CP-0CH4 based on ASTM E 275-01
Calibrated by: Kunchit Promprat

REVIEW BY: Ananta B.
 APPROVED BY: Kanika H.
 NEXT CAL DATE: 24/1/23

Approved by: 
 Approved Signatory

(/) Males Bulkruea
 (/) Sathip Meangmai
 (/) Warakorn Lernagatrakul

Issue Date: 7 February 2022

The Uncertainties are for a confidence probability of approximately 95%

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A 0037403



Cert. No. : 22CHO32
Page : 2 of 3

Condition of calibration result

1. Reference Standard Material :

Material	Serial No.	Certificate No.	Due date
1. Absorbance Standard set	8331	86623	08 Sep 2022
2. Wavelength Standard set	29829	94776	02 Sep 2023
3. Wavelength Standard set	29829	94777	02 Sep 2023

2. This certificate is valid only to the item calibrated on date and place of calibration.
3. This certificate is traceable to the International System of Unit maintained at :
- National Physical Laboratory (NPL), The United Kingdom of Great Britain and Northern Ireland
- National Institute of Standards and Technology (NIST), The United States of America

4. Spectral Bandwidth : 5 nm
Scan Speed : - nm/min

Calibration Results : without adjustment

Wavelength Accuracy

Certified Values of Reference Material (nm)	UUC Reading (nm)	Uncertainty of Measurement (\pm nm)	Coverage Factor k
418.40	418	0.59	2.00
479.88	480	0.59	2.00
513.75	514	0.59	2.00
537.00	536	0.59	2.00
638.00	638	0.59	2.00
747.61	748	0.59	2.00
807.04	807	0.59	2.00

Malee

a 1093315



Cert. No. : 22CHO32
Page : 3 of 3

Calibration Results : without adjustment

Photometric Accuracy

Wavelength (nm)	Certified Values of Reference Material (Abs)	UUC Reading (Abs)	Uncertainty of Measurement (\pm Abs)	Coverage Factor k
420.0	Zero	0.000	0.0028	2.00
	0.5723	0.572	0.0033	2.00
	0.7522	0.751	0.0031	2.00
	1.0907	1.090	0.0033	2.00
440.0	Zero	0.000	0.0028	2.00
	0.5616	0.560	0.0034	2.00
	0.7345	0.732	0.0032	2.00
	1.0646	1.063	0.0033	2.00
465.0	Zero	0.000	0.0028	2.00
	0.5116	0.514	0.0034	2.00
	0.6773	0.679	0.0031	2.00
	0.9809	0.984	0.0033	2.00
546.1	Zero	0.000	0.0028	2.00
	0.5228	0.522	0.0030	2.00
	0.6861	0.684	0.0030	2.00
	0.9941	0.993	0.0030	2.00
590.0	Zero	0.000	0.0028	2.00
	0.5546	0.552	0.0029	2.00
	0.7159	0.712	0.0030	2.00
	1.0359	1.033	0.0030	2.00
635.0	Zero	0.000	0.0028	2.00
	0.5401	0.538	0.0029	2.00
	0.6835	0.680	0.0029	2.00
	0.9889	0.986	0.0030	2.00

Remark

- Each individual filter is measured against the empty filter holder (blank) used to zero the spectrophotometer

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 %.

-00-

Malee

a 1093314



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES & EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD, SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2719 3500-27 FAX. 0-2719 9484



Cert.No.: 22CHO33
Page.: 1 of 4

Certificate of Calibration

Equipment : UV-VIS Spectrophotometer
Manufacturer : Agilent Technologies
Model : Cary 60 UV-Vis
Serial No. : MY16510028
ID No. : SGK_CL0040
Condition As-Received : Used Item
Received Date : 24 January 2022
Calibration Date : 24 January 2022
Reference : 2201-0617OC-2
Submitted by : ALS Laboratory Group (Thailand) Co., Ltd.
Songkhla Branch
114/1 Moo 8, Kanjanavanij Rd., Banphru, Hatyai,
Songkhla 90250, Thailand

Calibration Place : Chemistry Room
Ambient Temperature : (24.1 - 24.8) °C (On-Site)
Relative Humidity : (43.9 - 45.9) % (On-Site)
Calibration Procedure : In-house method :
CP-OCH4 based on ASTM E 275-01
Calibrated by : Kunchit Promprat

REVIEW BY : Ananias
APPROVED BY : Kanchana P.
NEXT CAL. DATE : Sep 11/23

Approved by : Malee
(/) Malee Butkruea
() Saitthip Meangmai
() Warakorn Lemgagtrakul
Issue Date : 7 February 2022

The Uncertainties are for a confidence probability of approximately 95%

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Approval of the head of Corporate Services & Equipment Calibration and Testing Services.

A 0037404



Cert. No. : 22CHO33
Page : 2 of 4

Condition of calibration result

1. Reference Standard Material :

Material	Serial No.	Certificate No.	Due date
1. Absorbance Standard set	32587	85662	17 July 2022
2. Absorbance Standard set	32590	85625	08 Sep 2022
3. Absorbance Standard set	8331	86623	08 Sep 2022
4. Wavelength Standard set	29829	94776	02 Sep 2023
5. Wavelength Standard set	29829	94777	02 Sep 2023

2. This certificate is valid only to the item calibrated on date and place of calibration.
3. This certificate is traceable to the International System of Unit maintained at :
- National Physical Laboratory (NPL), The United Kingdom of Great Britain and Northern Ireland
- National Institute of Standards and Technology (NIST), The United States of America

4. Spectral Bandwidth : 1.5 nm
Scan Speed : 20 nm/min

Calibration Results : without adjustment

Wavelength Accuracy

Certified Values of Reference Material (nm)	UUC Reading (nm)	Uncertainty of Measurement (\pm nm)	Coverage Factor k
241.72	241.1	0.13	2.00
334.06	333.5	0.13	2.00
418.59	418.2	0.13	2.00
573.17	573.4	0.18	2.11
879.29	878.9	0.13	2.00

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a 1093313



Cert. No. : 22CHO33
Page : 3 of 4

Calibration Results : without adjustment
Photometric Accuracy

Wavelength (nm)	Certified Values of Reference Material (Abs)	UUC Reading (Abs)	Uncertainty of Measurement (±Abs)	Coverage Factor k
235.0	Zero	0.0000	0.0046	2.00
	0.4970	0.4929	0.0046	2.00
	Zero	0.0000	0.0050	2.00
	0.7418	0.7364	0.0050	2.00
257.0	Zero	0.0000	0.0046	2.00
	0.5759	0.5710	0.0046	2.00
	Zero	0.0000	0.0050	2.00
	0.8534	0.8558	0.0050	2.00
313.0	Zero	0.0000	0.0046	2.00
	0.1932	0.1924	0.0046	2.00
	Zero	0.0000	0.0050	2.00
	0.2888	0.2877	0.0050	2.00
350.0	Zero	0.0000	0.0046	2.00
	0.4281	0.4249	0.0046	2.00
	Zero	0.0000	0.0050	2.00
	0.6406	0.6362	0.0050	2.00

Remark

- The Potassium Dichromate filled cells are measured against a Perchloric acid blank.

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a 1093312



Cert. No. : 22CHO33
Page : 4 of 4

Calibration Results : without adjustment
Photometric Accuracy

Wavelength (nm)	Certified Values of Reference Material (Abs)	UUC Reading (Abs)	Uncertainty of Measurement (±Abs)	Coverage Factor k
420.0	Zero	0.0000	0.0028	2.00
	0.5723	0.5693	0.0033	2.00
	0.7522	0.7486	0.0031	2.00
	1.0907	1.0865	0.0032	2.00
440.0	Zero	0.0000	0.0028	2.00
	0.5616	0.5593	0.0033	2.00
	0.7345	0.7319	0.0031	2.00
	1.0646	1.0619	0.0033	2.00
465.0	Zero	0.0000	0.0028	2.00
	0.5118	0.5099	0.0034	2.00
	0.6773	0.6751	0.0030	2.00
	0.9809	0.9786	0.0033	2.00
546.1	Zero	0.0000	0.0028	2.00
	0.5228	0.5208	0.0029	2.00
	0.6861	0.6834	0.0029	2.00
	0.9941	0.9907	0.0029	2.00
590.0	Zero	0.0000	0.0028	2.00
	0.5546	0.5525	0.0029	2.00
	0.7159	0.7130	0.0029	2.00
	1.0369	1.0330	0.0029	2.00
635.0	Zero	0.0000	0.0028	2.00
	0.5401	0.5387	0.0028	2.00
	0.6835	0.6810	0.0029	2.00

Remark

- Each individual filter is measured against the empty filter holder (blank) used to zero the spectrophotometer

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 %.

-00-

Mdu

a 1093311



Southern Calibration Service Co., Ltd.

669/35 Kamjanavanit Rd., Banpru, Hatyai, Songkhla 90250 Thailand
Tel: 081 599 0417 Fax: 074 805 133 Email: s.calibration@gmail.com www.scal-lab.com



CALIBRATION CERTIFICATE

Issued Date : 19-Aug-2021

Certificate No. : 21OV449
CSR No. : A078/3892
Page : 1 of 3

Customer : ALS Laboratory Group (Thailand) Co., Ltd.
114/1 Moo 8 Kamchanawanich Rd. T.Ban Phru,
A. Hat Yai, Songkhla 90250 TH

Calibration Place : Chemical Laboratory
Instrument Name : Cold Room Water
Manufacturer : MODULAR
Model : N/A
Serial No. : N/N
ID No. : SGK_CL0065
Resolution : 0.1 °C
Received Date : 16-Aug-2021
Calibrated Date : 16-Aug-2021
Ambient Temperature : (30 ± 10) °C
Relative Humidity : (50 ± 30) %

REVIEW BY : *Suthinuk P.*
APPROVED BY : *Kanitha H.*
NEXT CAL DATE : 16/08/2025

Calibration Method Used :

This instrument was calibrated using the Calibration In-house method : SCAL.WI.012 based on G-20
The Southern Calibration Service Co., Ltd. calibration control system complies with requirement of ISO/IEC 17025:2017

Traceability of measurement :

This Certificate is traceable to the International and/or national standards which realize the units of measurement according to the International System of Unit (SI) through :

- Q Reborn : Quality Reborn Co., Ltd.

Calibrated by : Ibrorhim Saleemini

Approved by : *Sakeereen*
Sakeereen Hecmlad / Technical Manager

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Certificate No. : 21OV449
CSR No. : A078/3892
Page : 2 of 3

Details of Calibration

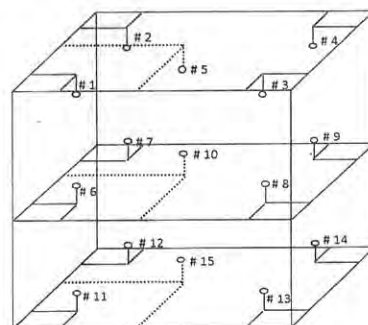
Reference Standard Equipment Used:

Equipment	Model	Serial No.	Cert. no.	Due Date
Data logger With Sensor	34970A	MY44064411	QR21-0314	9-Feb-2022

- The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of instrument.
- This certificate is not certified any commercial transaction
- Condition of Item : normal condition , no indication for any damage or malfunction

Result of Calibration : (✓) Without Adjustment () After Adjustment

1. Sensor Installation Diagram



Sensor Installation Details

a = 5.0 cm
b = 5.0 cm
c = 5.0 cm

Dimension of the chamber

W = 370.0 cm
H = 250.0 cm
D = 540.0 cm



Certificate No. : 21OV449

CSR No. : A078/3892

Page : 3 of 3

Result of Calibration:**2. Temperature Measurement Accuracy Test**

The measurement results of the Cold Room Water and associates are reported in the manner as shown below

Cal point (°C)	Measured Standard Temperature At Spread Locations (°C)														
	#1	#2	#3	#4	#5	#6	#7	#8	#9	Ref.10	#11	#12	#13	#14	#15
4	3.63	3.35	3.58	3.80	4.14	3.76	3.77	3.72	3.82	3.80	3.62	3.88	3.67	3.80	3.61

The uncertainty of measurement was ± 0.38 °C

3. Performance Result

The performance of the Cold Room Water are reported as shown below

Cal point (°C)	UUC Setting (°C)	UUC Reading (°C)	Temperature Stability (±°C)	Temperature Uniformity (°C)	Overall Variation (°C)
4	4.0	4.0	1.23	0.69	3.33

* UUC = Unit Under Calibration

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

... End ...

**Southern Calibration Service Co., Ltd.**

669/35 Kamjanavanit Rd., Banphu, Hatyai, Songkhla 90250 Thailand

Tel: 081 599 0417 Fax: 074 805 133 Email: s.calibration@gmail.com www.scaL-lab.com

**CALIBRATION CERTIFICATE**

Issued Date : 12-Nov-2021

Certificate No. : 21PH192

CSR No. : A012/00583

Page : 1 of 2

Customer : ALS Laboratory Group (Thailand) Co., Ltd

114/1 Moo 8 Kamchanawanich Rd. T.Ban Phru,

A. Hat Yai, Songkhla 90250 TH

Calibration Place : Chemical Laboratory

Instrument Name : pH meter

Manufacturer : Mettler Toledo

Model : S220

Serial No. : B625631849

ID No. : SGK_CL0030

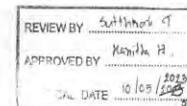
Electrode No. : 6404000

Received Date : 9-Nov-2021

Calibrated Date : 9-Nov-2021

Ambient Temperature : (25 ± 3) °C

Relative Humidity : (55 ± 15) %

**Calibration Method Used :**

This instrument was calibrated using the Calibration In - house method : SCAL.W1.008 based on direct measurement by using certified reference Material (CRM)

The Southern Calibration Service Co.,Ltd.calibration control system complies with requirement of ISO/IEC 17025:2017

Traceability of measurement :

This Certificate is traceable to the International and/or national standards which realize the units of measurement according to the International System of Unit (SI) through :

- HACH : LANGE United For Water Quality

- WK : WK Electric Co., Ltd.

- Q Reborn : Quality Reborn Co.,Ltd.

Calibrated by : Jessadagon Lemhud

Approved by :

Sakreem Heemhad / Technical Manager

The uncertainties are for a confidence probability of approximately 95%

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



Certificate No. : 21PH192

CSR No. : A012/00583

Page : 2 of 2

Details of Calibration**1. Reference Standard Equipment Used:**

Equipment	Model	Serial No.	Cert. no.	Due Date
Standard Solution	4.005	C02840	1617	24-Aug-2022
Standard Solution	7.000	C02841	1618	24-Aug-2022
Standard Solution	10.012	C02843	1619	24-Aug-2022
Temperature/Electrical Calibrator	MC2-MF	23642	WK2102-006-229	21-Feb-2022
Digital Thermometer With Sensor	1529	B4C223	QR21-2009	15-Sep-2022

2. The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the longterm stability of instrument

3. This certificate is not certified any commercial transaction

4. Condition of Item : normal condition , no indication for any damage or malfunction

Result of Calibration : (✓) Without Adjustment () After Adjustment

1. Electrical Measurement

Applied Voltage (mV)	pH meter Reading (mV)	Correction (mV)	Uncertainty (± mV)
177.48	177.5	-0.02	0.17
0.00	0.0	0.00	0.13
-177.48	-177.5	0.02	0.17

2. Sample Test Measurement

Standard Buffer Solutions (pH)	pH meter Reading (pH)	Correction (pH)	Uncertainty (± pH)
4.007	3.99	0.017	0.011
6.999	7.02	-0.021	0.014
10.011	10.01	0.001	0.036

3. Temperature Measurement

Cal Point (°C)	Standard Temperature (°C)	UUC Reading (°C)	Correction (°C)	Uncertainty (±°C)
25	24.93	25.0	-0.07	0.11

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

... End ...

**Southern Calibration Service Co., Ltd.**

669/35 Kamjanavanit Rd., Banphu, Hatyai, Songkhla 90250 Thailand

Tel: 081 599 0417 Fax: 074 805 133 Email: s.calibration@gmail.com www.scaL-lab.com

**CALIBRATION CERTIFICATE**

Issued Date : 8-Feb-2022

Certificate No. : 22EB149

CSR No. : A023/01122

Page : 1 of 3

Customer : ALS Laboratory Group (Thailand) Co., Ltd

114/1 Moo 8 Kamchanawanich Rd. T.Ban Phru,

A. Hat Yai, Songkhla 90250 TH

Calibration Place : Chemical Laboratory

Instrument Name : Electronic Balance

Manufacturer : Sartorius

Model : MSE224S-100 DU

Serial No. : 34705158

ID No. : SGK_CL0045

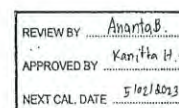
Resolution : 0.0001 g

Received Date : 5-Feb-2022

Calibrated Date : 5-Feb-2022

Ambient Temperature : (30 ± 10) °C

Relative Humidity : (50 ± 20) %

**Calibration Method Used :**

This instrument was calibrated using the Calibration In - house method : SCAL.W1.001 based on UKAS LAB 14 : 2015

The Southern Calibration Service Co.,Ltd.calibration control system complies with requirement of ISO/IEC 17025:2017

Traceability of measurement :

This Certificate is traceable to the International and/or national standards which realize the units of measurement according to the International System of Unit (SI) through :

- Tcs : Thai Calibration Service Co.,Ltd.

Calibrated by : Imnon Rattanaaylum

Approved by :

Sakreem Heemhad / Technical Manager

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Certificate No. : 22EB149
 CSR No. : A02301123
 Page. : 2 of 3

Details of Calibration

1. Reference Standard Equipment Used:

Equipment	Model	Serial No.	Cert. no.	Due Date
Standard Weight Set	2mg-2kg	1111951401	M2107051S	6-Jul-2022

2. The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of instrument.

3. This certificate is not certified any commercial transaction

4. Condition of item : normal condition , no indication for any damage or malfunction

Result of Calibration : (✓) Without Adjustment () After Adjustment

1. Repeatability

Nominal Value (g)	Standard Deviation (g)
200	0.00000

2. Effect of tare

Nominal Value (g)	Standard Value (g)	Balance Reading (g)	Correction (g)
20	20.0000	20.0000	0.0000
40	40.0001	40.0000	0.0001
60	60.0000	60.0001	-0.0001
80	80.0001	80.0001	-0.0001
100	100.0000	100.0000	0.0000



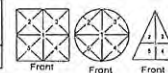
Certificate No. : 22EB149
 CSR No. : A02301123
 Page. : 3 of 3

Result of Calibration :

3. Off-centre loading

A mass approximately 50g was placed on a pan and moved to various position.
 The balance reading obtained are given in the table.

Position					Maximum Difference (g)
1	2	3	4	5	
50.0000	50.0000	50.0000	50.0000	50.0000	0.0000



4. Departure from nominal value

Nominal Value (g)	Standard Value (g)	UUC Reading (g)	Correction (g)	Uncertainty (±g)	Coverage Factor (k)
0.01	0.0100	0.0100	0.0000	0.00008	2.0
0.1	0.1000	0.1000	0.0000	0.00008	2.0
0.5	0.5000	0.5000	0.0000	0.00008	2.0
1	1.0000	1.0000	0.0000	0.00008	2.0
2	2.0000	2.0000	0.0000	0.00008	2.0
5	5.0000	5.0000	0.0000	0.00009	2.0
10	10.0000	10.0000	0.0000	0.00009	2.0
20	20.0000	20.0000	0.0000	0.00009	2.0
50	50.0000	50.0000	0.0000	0.00011	2.0
100	100.0000	100.0000	0.0000	0.00016	2.0
120	120.0000	120.0000	0.0000	0.00024	2.0
140	140.0001	140.0000	0.0001	0.00024	2.0
160	160.0000	160.0000	0.0000	0.00026	2.0
180	180.0000	180.0000	0.0000	0.00029	2.0
200	200.0000	200.0000	0.0000	0.00030	2.0

- UUC = Unit Under Calibration

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

...End...



Southern Calibration Service Co., Ltd.

669/35 Kamjanavanit Rd., Banpru, Hatyai, Songkhla 90250 Thailand
 Tel: 081 599 0417 Fax: 074 805 133 Email: s.calibration@gmail.com www.scaL-lab.com



CALIBRATION CERTIFICATE

Issued Date : 12-Nov-2021

Certificate No. : 21OV733
 CSR No. : A012/00583
 Page. : 1 of 3

Customer : ALS Laboratory Group (Thailand) Co., Ltd.
 114/1 Moo 8 Kamchanawanich Rd. T. Ban Phru,
 A. Hat Yai, Songkhla 90250 TH

Calibration Place : Chemical Laboratory
 Instrument Name : Hot Air Oven
 Manufacturer : Memmert
 Model : UF110
 Serial No. : B416.3387
 ID No. : SGK_CL0024
 Resolution : 0.1 °C
 Received Date : 9-Nov-2021
 Calibrated Date : 9-Nov-2021
 Ambient Temperature : (30 ± 10) °C
 Relative Humidity : (50 ± 30) %

REVIEW BY : *[Signature]*
 APPROVED BY : *[Signature]*
 NEXT CAL DATE : 10/09/2025

Calibration Method Used :

This instrument was calibrated using the Calibration In-house method : SCAL-W1.012 based on G-20
 The Southern Calibration Service Co., Ltd. calibration control system complies with requirement of ISO/IEC 17025:2017.

Traceability of measurement :

This Certificate is traceable to the International and/or national standards which realize the units of measurement according to the International System of Unit (SI) through :

- Q Reborn Quality Reborn Co., Ltd.

Calibrated by : Ibrorhim Salemin

Approved by : *[Signature]*
 Sakeerun Heemad Technical Manager

The uncertainties are for a confidence probability of approximately 95%

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Certificate No. : 21OV733
 CSR No. : A012/00583
 Page. : 2 of 3

Details of Calibration

1. Reference Standard Equipment Used:

Equipment	Model	Serial No.	Cert. no.	Due Date
Data logger With Sensor	34970A	MY44064411	QR21-0314	9-Feb-2022

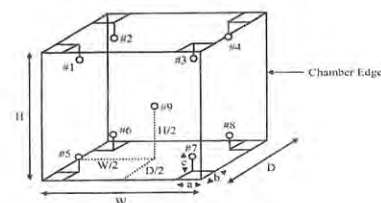
2. The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of instrument.

3. This certificate is not certified any commercial transaction

4. Condition of item : normal condition , no indication for any damage or malfunction

Result of Calibration : (✓) Without Adjustment () After Adjustment

1. Sensor Installation Diagram



Sensor Installation Details

a = 5.0 cm
 b = 5.0 cm
 c = 5.0 cm

Dimension of the chamber

W = 40.0 cm
 H = 40.0 cm
 D = 33.0 cm



Certificate No. : 21OV733
CSR No. : A012/00583
Page : 3 of 3

Result of Calibration :

2. Temperature Measurement Accuracy Test

The measurement results of the Hot Air Oven and associates are reported in the manner as shown below

Cal point (°C)	Measured Standard Temperature At Spread Locations (°C)								Ref. 9	Uncertainty (±°C)
	#1	#2	#3	#4	#5	#6	#7	#8		
40	39.85	39.81	39.68	39.57	39.94	39.80	39.81	39.93	39.69	0.36
70	70.53	70.23	70.08	69.74	70.51	70.37	70.43	69.79	70.15	0.36
103	103.47	102.96	102.95	102.77	103.40	103.46	103.33	102.73	102.83	0.36
104	104.47	103.92	103.95	103.77	104.33	104.46	104.30	103.73	103.80	0.36
105	105.34	104.85	104.85	104.67	105.16	105.27	105.07	104.81	105.06	0.36
180	180.04	180.03	179.99	179.86	180.11	180.28	180.27	180.16	180.26	0.41

3. Performance Result

The performance of the Hot Air Oven are reported as shown below

Cal point (°C)	UUC Setting (°C)	UUC Reading (°C)	Temperature Stability (±°C)	Temperature Uniformity (°C)	Overall Variation (°C)
40	40.0	40.0	0.10	0.34	0.47
70	70.0	70.0	0.10	0.48	0.82
103	103.0	103.0	0.10	0.71	0.74
104	104.0	104.0	0.10	0.71	0.74
105	105.0	105.0	0.20	0.39	0.70
180	180.0	180.0	0.20	0.53	0.62

- UUC = Unit Under Calibration

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

... End ...



Southern Calibration Service Co., Ltd.
669/35 Karnjanavanit Rd., Banpui, Hatyai, Songkhla 90250 Thailand
Tel: 081 599 0417 Fax: 074 805 133 Email: s.calibration@gmail.com www.scal-lab.com



CALIBRATION CERTIFICATE

Issued Date : 8-Feb-2022

Certificate No. : 22WB004

CSR No. : A0223/01123

Page : 1 of 3

Customer : ALS Laboratory Group (Thailand) Co., Ltd
114/1 Moo 8 Karnchanawanich Rd. T.Ban Phru,
A. Hat Yai, Songkhla 90250 TH

Calibration Place : Chemical Laboratory
Instrument Name : Water Bath
Manufacturer : Memmert
Model : WNE29
Serial No. : L616.0538
ID No. : SGK_CL0035
Resolution : 0.1 °C
Received Date : 5-Feb-2022
Calibrated Date : 5-Feb-2022
Ambient Temperature : (30 ± 10) °C
Relative Humidity : (50 ± 30) %

REVIEW BY : *Athena B.*
APPROVED BY : *Kan Hye H.*
NEXT CAL. DATE : 6/07/2023

Calibration Method Used :

This instrument was calibrated using the Calibration In - house method : SCAL.W1.014 based on ASTM E 715 : 1980 (reapproved 2001)

The Southern Calibration Service Co., Ltd. calibration control system complies with requirement of ISO/IEC 17025:2017

Traceability of measurement :

This Certificate is traceable to the International and/or national standards which realize the units of measurement according to the International System of Unit (SI) through :

- Q Reborn : Quality Reborn Co., Ltd.

Calibrated by : Imron Rattanyulm

Approved by :

Sekereen Hoemlad / Technical Manager

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Certificate No. : 22WB004
CSR No. : A0223/01123
Page : 2 of 3

Details of Calibration

1. Reference Standard Equipment Used:

Equipment	Model	Serial No.	Cert. no.	Due Date
Data logger With Sensor	34970A	MY44064411	QR21-0314	9-Feb-2022

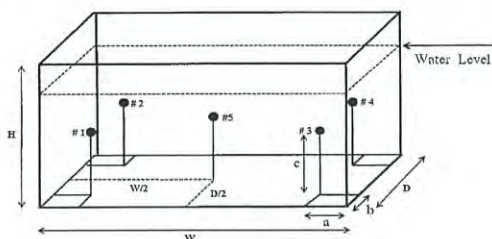
2. The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the long-term stability of instrument.

3. This certificate is not certified any commercial transaction

4. Condition of Item : normal condition, no indication for any damage or malfunction

Result of Calibration : (✓) Without Adjustment () After Adjustment

1. Sensor Installation Diagram



Sensor Installation Details

a = 5 cm
b = 5 cm
c = 5 cm

Dimension of the chamber

W = 45 cm
H = 30 cm
D = 35 cm



Certificate No. : 22WB004
CSR No. : A0223/01123
Page : 3 of 3

Result of Calibration :

2. Temperature Measurement Accuracy Test

The measurement results of the Water Bath and associates are reported in the manner as shown below

Cal point (°C)	Measured Standard Temperature At Spread Locations (°C)					Ref.5	Uncertainty (±°C)
	#1	#2	#3	#4	#5		
80	79.95	80.07	79.95	79.99	80.03	80.03	0.14

3. Performance Result

The performance of the Water Bath are reported as shown below

Cal point (°C)	UUC Setting (°C)	UUC Reading (°C)	Temperature Stability (±°C)	Temperature Uniformity (°C)	Overall Variation (°C)
80	81.0	81.0	0.10	0.19	0.19

- UUC = Unit Under Calibration

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

... End ...

บริษัท ดับเบิล เอส ไดแอกโนสติกส์ จำกัด
DOUBLE S DIAGNOSTICS CO., LTD.

100 หมู่ 10 ต.บ้านใหม่ อ.เมือง จ.นนทบุรี 11000 โทร: 02-551-7000 โทรสาร: 02-551-7001
100 หมู่ 10 ต.บ้านใหม่ อ.เมือง จ.นนทบุรี 11000 โทร: 02-551-7000 โทรสาร: 02-551-7001

Maintenance Plan YEAR : 2021

เดือน	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
10												

Periodical maintenance check list for Konelab

	6M	12M	Note
1. Instrument with holding change	<input type="checkbox"/>	<input type="checkbox"/>	
2. ISE tubing change	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Syringe check/change	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4. Dispensing check/change	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
5. Waste tubing change when necessary	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
6. Pump check/change	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
7. Meter paddle/saddle change(not Konelab20)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
8. ISE needles check/change	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
9. Pump tubing check/change	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
10. Probe/sensor out part check/change	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
11. Peristaltic pump check/cleaning/lubrication	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
12. Heating check	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
13. Cooling check	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
14. Dispenser mechanic check/adjustment	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
15. Gvette transfer mechanic check/adjustment	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
16. Dispenser movement check/adjustment	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
17. Sample/reagent register check/adjustment	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
18. Dispensing tubing tightness check	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
19. Photometer and optics cleaning/check/adjustment	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
20. Verification PC cleaning if necessary	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
21. Machine cleaning/lubrication	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
22. Instrument cleaning if necessary	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
23. Complete analyzer testing with waterblank/QC or sample	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
24. Test parameters/Adjustment/config. Save to USB key	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
25. IIS Test	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Place: ALS Lab Instrument: Konelab 20
Date/Time: 12/12/2021 Serial no: 20781
Operator: Mr. Thitipong Piromkriput Install date: 10/01/21
Signature of customer: Mr. Thitipong Piromkriput Date/Time: 10/01/21



REVIEW BY: Autichawan S.
APPROVED BY: Somarat M.
NEXT CAL. DATE: 12/30/22

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.

Operator Signature: Mr. Thitipong Piromkriput Date: Jan 12, 2022

(Mr. Thitipong Piromkriput)

Applications Chemist



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
53/4 PATTANAKARN ROAD SOI 18, SUANLIANG, SUANLIANG BANGKOK 10250
TEL: 0-2717-3000-27 FAX: 02-719 9484



Cert.No.: 21CH626/1
Page.: 1 of 2

Certificate of Calibration

This Certificate was issued to replace to the Certificate No. 21CH626

Equipment: Conductivity Meter
Manufacturer: Mettler Toledo
Model: SevenCompact S230
Serial No.: B008134488
ID No.: SGK_CL0032
Condition As-Received: Used Item
Received Date: 07 May 2021
Calibration Date: 15 May 2021
Reference: 2105-0170DSC-1
Submitted by: ALS Laboratory Group (Thailand) Co., Ltd. Songkhla Branch, 114/1 Moo 8 Kamchansawanich Rd., T.Ban Phru, A.Hai Yai, Songkhla 90250 Thailand
Ambient Temperature: (25 ± 2.5) °C
Relative Humidity: (25 ± 15) %
Calibration Procedure: In-house method :
- CP-CH6 : based on direct measurement by using certified reference material (CRM)
Calibrated by: Sathip Meangmal
Approved by: Sathip Meangmal
Approved Signatory
Issue Date: 23 June 2021

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.

A 0029216



Cert.No.: 21CH626/1
Page.: 2 of 2

Condition of this result of calibration

1. Reference Standard Instrument :-

Instrument	Serial No.	ID No.	Certificate No.	Due date
1) Ref. Std. Thermometer	2188080	130RC044	2011389	19 Nov 2021

This certification is traceable to the International System of Unit maintained at:-
- Traceable to National Institute of Metrology (Thailand), NIMT

2. Certified Reference Materials :-

- Conductivity calibration solution, CPA chem Ltd., The measurement results are traceable to SI through CPA chem Ltd., ANSI-ASQ National Accreditation Board, Accredited No. AR-1835

Conductivity Solution	Manufacturer	Lot No.	Exp. date
*84.001 µS/cm	CPA chem	725921	12 Jan 2022
1413.0 µS/cm	CPA chem	706699	06 Sep 2021
12.880 mS/cm	CPA chem	693951	12 Jun 2021

- Control Conductivity calibration solution temperature by Water bath (25±0.1) °C

3. This certificate is valid only to the item calibrated on date and place of calibration.

Calibration results

Function: Conductivity Measurement

(*) After Adjustment at 1413.0 µS/cm

Conductivity Electrode Serial No.: 5816340155

Standard Conductivity Solution	Before Adjustment UUC* Reading	After Adjustment UUC* Reading	Uncertainty of Measurement (±)	Coverage factor k
*84.001 µS/cm	863 µS/cm	87.8 µS/cm	0.63 µS/cm	2.00
1413.0 µS/cm	13.55 mS/cm	1412 µS/cm	9.2 µS/cm	2.00
12.880 mS/cm	98.70 mS/cm	10.30 mS/cm	± 0.085 mS/cm	2.00

Remark : Cell constant = 0.104305 cm⁻¹

(*) After Adjustment at 1413.0 µS/cm

Conductivity Electrode Serial No.: 5820120321

Standard Conductivity Solution	Before Adjustment UUC* Reading	After Adjustment UUC* Reading	Uncertainty of Measurement (±)	Coverage factor k
*84.001 µS/cm	86.6 µS/cm	85.0 µS/cm	0.59 µS/cm	2.00
1413.0 µS/cm	1410 µS/cm	1413 µS/cm	9.0 µS/cm	2.00
12.880 mS/cm	12.82 mS/cm	12.84 mS/cm	0.082 mS/cm	2.00

Remark : Cell constant = 0.588597 cm⁻¹

- UUC* = Unit Under Calibration

- *: Not NSC - ONSC Accredited

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

-000-

a 1060266



Southern Calibration Service Co., Ltd.

669/35 Kamjanavanit Rd., Banpru, Hatyai, Songkhla 90250 Thailand
Tel: 081 599 0417 Fax: 074 805 133 Email: s.calibration@gmail.com www.scal-lab.com



CALIBRATION CERTIFICATE

Issued Date : 8-Jul-2021

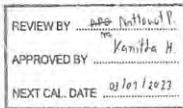
Certificate No. : 21ATC051

CSR No. : A047/2301

Page : 1 of 3

Customer : ALS Laboratory Group (Thailand) Co., Ltd
114/1 Moo 8 Kamchanawanich Rd. T.Ban Phru,
A. Hat Yai, Songkhla 90250 TH

Calibration Place : Microbiological Laboratory
Instrument Name : Autoclave
Manufacturer : TOMY
Model : SX-700
Serial No. : 52134079
ID No. : SGK_ML0001
Resolution : 1 °C
Received Date : 5-Jul-2021
Calibrated Date : 5-Jul-2021
Ambient Temperature : (30 ± 10) °C
Relative Humidity : (50 ± 30) %



Calibration Method Used :

This instrument was calibrated using the Calibration In - house method : SCAL.W1.16.013 based on BS 2646 : 1993 (part 5)
The Southern Calibration Service Co.,Ltd.calibration control system complies with requirement of ISO/IEC 17025:2017

Traceability of measurement :

This Certificate is traceable to the International and/or national standards which realize the units of measurement according to the International System of Unit (SI) through :
- SCAL : Southern Calibration Service Co., Ltd.,

Calibrated by : Ibrorhim Saleemin

Approved by :

Adull Lemsoh / Laboratory Manager

The uncertainty are for a confidence probability of approximately 95%

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Certificate No. : 21ATC051

CSR No. : A047/2301

Page : 2 of 3

Details of Calibration

1. Reference Standard Equipment Used:

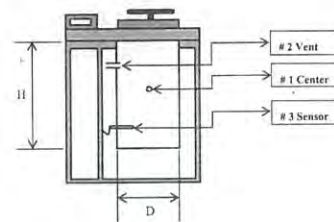
Equipment	Model	Serial No.	Cert. no.	Due Date
Data logger With Sensor	GL220	H11119557	21SDAT001	7-May-2022

- The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the longterm stability of instrument.
- This certificate is not certified any commercial transaction
- Condition of Item : normal condition ,no indication for any damage or malfunction

Result of Calibration :

(✓) Without Adjustment () After Adjustment

1. Sensor Installation Diagram



Chamber Diameter (D) : 30 cm

Chamber Height (H) : 70 cm



Certificate No. : 21ATC051

CSR No. : A047/2301

Page : 3 of 3

Result of Calibration :

2. Temperature Measurement Accuracy Test

The measurement results of the Autoclave and associates are reported in the manner as shown below

Cal point (°C)	Measured Standard Temperature At Spread Locations (°C)			Pressure Reading	Operating Time (sec)	Uncertainty (±°C)
	Center #1	Vent #2	Sensor #3			
115	116.2	115.9	116.3	0.8 MPa	1800.18	0.76
118	119.2	118.9	119.3	0.1 MPa	1800.26	0.76
121	121.5	121.2	121.6	0.12 MPa	1800.34	0.76

3. Performance Result

The performance of the Autoclave are reported as shown below

Cal point (°C)	UUC Setting (°C)	UUC Reading (°C)	Temperature Stability (±°C)	Temperature Uniformity (°C)	Overall Variation (°C)
115	115	115	0.10	0.50	0.50
118	118	118	0.10	0.50	0.50
121	121	121	0.00	0.40	0.40

* UUC = Unit Under Calibration

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

... End ...



Southern Calibration Service Co., Ltd.

669/35 Kamjanavanit Rd., Banpru, Hatyai, Songkhla 90250 Thailand
Tel: 081 599 0417 Fax: 074 805 133 Email: s.calibration@gmail.com www.scal-lab.com



CALIBRATION CERTIFICATE

Issued Date : 11-Feb-2021

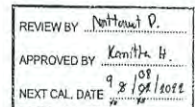
Certificate No. : 21OV108

CSR No. : A029/1431

Page : 1 of 3

Customer : ALS Laboratory Group (Thailand) Co., Ltd
114/1 Moo 8 Kamchanawanich Rd. T.Ban Phru,
A. Hat Yai, Songkhla 90250 TH

Calibration Place : Microbiological Laboratory
Instrument Name : Incubator
Manufacturer : Memmert
Model : ICP750
Serial No. : F816.0061
ID No. : SGK_ML0013
Resolution : 0.1 °C
Received Date : 8-Feb-2021
Calibrated Date : 8-Feb-2021
Ambient Temperature : (30 ± 10) °C
Relative Humidity : (50 ± 30) %



Calibration Method Used :

This instrument was calibrated using the Calibration In - house method : SCAL.W1.012 based on G-20

The Southern Calibration Service Co.,Ltd.calibration control system complies with requirement of ISO/IEC 17025:2017

Traceability of measurement :

This Certificate is traceable to the International and/or national standards which realize the units of measurement according to the International System of Unit (SI) through :
- Q Reborn : Quality Reborn Co.,Ltd.

Calibrated by : Ibrorhim Saleemin

Approved by :

Sakeerren Heemhad / Laboratory Manager

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Certificate No. : 21OV108
CSR No. : A029/1431
Page : 2 of 3

Details of Calibration

1. Reference Standard Equipment Used:

Equipment	Model	Serial No.	Cert. no.	Due Date
Data logger With Sensor	34970A	MY44064411	QR20-0166	11-Feb-2021

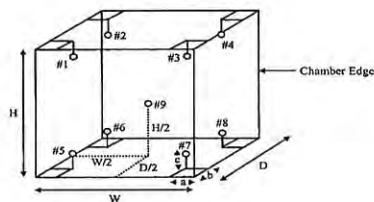
2. The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the longterm stability of instrument.

3. This certificate is not certified any commercial transaction

4. Condition of Item : normal condition , no indication for any damage or malfunction

Result of Calibration : (✓) Without Adjustment () After Adjustment

1. Sensor Installation Diagram



Sensor Installation Details

a = 5.0 cm
b = 5.0 cm
c = 5.0 cm

Dimension of the chamber

W = 104.0 cm
H = 120.0 cm
D = 60.0 cm



Certificate No. : 21OV108
CSR No. : A029/1431
Page : 3 of 3

Result of Calibration :

2. Temperature Measurement Accuracy Test

The measurement results of the Incubator and associates are reported in the manner as shown below

Cal point (°C)	Measured Standard Temperature At Spread Locations (°C)									Uncertainty (±°C)
	#1	#2	#3	#4	#5	#6	#7	#8	Ref. 9	
35	35.07	35.07	35.00	35.06	35.13	35.06	35.01	35.08	35.09	0.38

3. Performance Result

The performance of the Incubator are reported as shown below

Cal point (°C)	UUC Setting (°C)	UUC Reading (°C)	Temperature Stability (±°C)	Temperature Uniformity (°C)	Overall Variation (°C)
35	35.0	35.0	0.10	0.14	0.22

* UUC = Unit Under Calibration

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

... End ...



Southern Calibration Service Co., Ltd.

609/35 Kamjanavanit Rd., Banpru, Hatyai, Songkhla 90250 Thailand
Tel 081 599 0417 Fax: 074 895 133 Email: s.calibration@gmail.com www.scaL-lab.com



CALIBRATION CERTIFICATE

Issued Date : 8-Jul-2021

Certificate No. : 21PH098
CSR No. : A047/2301
Page : 1 of 2

Customer : ALS Laboratory Group (Thailand) Co., Ltd.
114/1 Moo 8 Kanchanawachin Rd. T. Ban Phru,
A. Hat Yai, Songkhla 90250 TH

Calibration Place : Microbiological Laboratory
Instrument Name : pH meter
Manufacturer : Sartorius
Model : Basic pH Meter PB-10
Serial No. : C07160695
ID No. : SGK_ML0016
Electrode No. : N/A
Received Date : 5-Jul-2021
Calibrated Date : 5-Jul-2021
Ambient Temperature : (25 ± 3) °C
Relative Humidity : (55 ± 15) %

REVIEW BY : *[Signature]*
APPROVED BY : *[Signature]*
NEXT CAL. DATE : 03/01/2023

Calibration Method Used :

This instrument was calibrated using the Calibration In-house method : SCAL.W1.008 based on direct measurement by using certified reference Material (CRM)

The Southern Calibration Service Co., Ltd. calibration control system complies with requirement of ISO/IEC 17025:2017

Traceability of measurement :

This Certificate is traceable to the International and/or national standards which realize the units of measurement according to the International System of Unit (SI) through :

- HACH : LANGE United For Water Quality
- WK : WK Electric Co., Ltd.

Calibrated by : Jessadagon Lemhud

Approved by : *[Signature]*
Adull Lemhud / Laboratory Manager

The uncertainties are for a confidence probability of approximately 95%

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Certificate No. : 21PH098
CSR No. : A047/2301
Page : 2 of 2

Details of Calibration

1. Reference Standard Equipment Used:

Equipment	Model	Serial No.	Cert. no.	Due Date
Standard Solution	4.005	C02730	1503	22-May-2022
Standard Solution	7.000	C02775	1551	20-Oct-2022
Standard Solution	10.012	C02770	1545	17-Sep-2022
Temperature/Electrical Calibrator	MC2-MF	23642	WK2102-006-229	21-Feb-2022

2. The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the longterm stability of instrument.

3. This certificate is not certified any commercial transaction

4. Condition of Item : normal condition , no indication for any damage or malfunction

Result of Calibration : (✓) Without Adjustment () After Adjustment

1. Electrical Measurement

Applied Voltage (mV)	pH meter Reading (mV)	Correction (mV)	Uncertainty (±mV)
177.48	177.4	0.08	0.17
0.00	0.0	0.00	± 0.13
-177.48	-177.4	-0.08	0.17

2. Sample Test Measurement

Standard Buffer Solutions (pH)	pH meter Reading (pH)	Correction (pH)	Uncertainty (±pH)
4.006	3.99	0.016	0.012
6.997	7.01	-0.013	0.015
10.012	9.98	0.032	0.036

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

... End ...



Southern Calibration Service Co., Ltd.

669/35 Kampanavanit Rd., Banphru, Hatyai, Songkhla 90250 Thailand
Tel: 081 599 0417 Fax: 074 805 133 Email: s.calibration@gmail.com www.scal-lab.com



CALIBRATION CERTIFICATE

Issued Date : 9-Aug-2021

Certificate No. : 21WB064

CSR No. : A047/2346

Page : 1 of 3

Customer : ALS Laboratory Group (Thailand) Co., Ltd.
114/1 Moo 8 Kamchanawanich Rd. T.Ban Phru,
A. Hat Yai, Songkhla 90250 TH
Calibration Place : Microbiological Laboratory
Instrument Name : Water Bath
Manufacturer : Memmert
Model : WPE45
Serial No. : L716.0558
ID No. : SGK_ML0021
Resolution : 0.1 °C
Received Date : 6-Aug-2021
Calibrated Date : 6-Aug-2021
Ambient Temperature : (30 ± 10) °C
Relative Humidity : (50 ± 30) %

REVIEW BY *Kanittha H.*
APPROVED BY *Kanittha H.*
NEXT CAL DATE *8/08/2025*

Calibration Method Used :

This instrument was calibrated using the Calibration In - house method : SCAL.W1.014 based on ASTM E 715 : 1980 (reapproved 2001)

The Southern Calibration Service Co., Ltd. calibration control system complies with requirement of ISO/IEC 17025:2017

Traceability of measurement :

This Certificate is traceable to the International and /or national standards which realize the units of measurement according to the International System of Unit (SI) through :

- Q Reborn : Quality Reborn Co., Ltd.

Calibrated by : Ibrohim Saleemin

Approved by :

Sakereen Hoemhad / Technical Manager

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

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Certificate No. : 21WB064

CSR No. : A047/2346

Page : 2 of 3

Details of Calibration

1. Reference Standard Equipment Used:

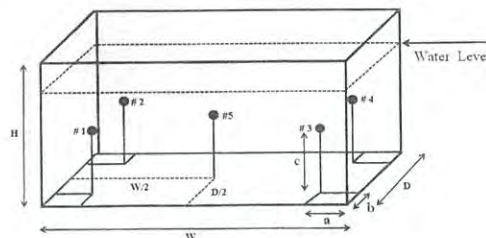
Equipment	Model	Serial No.	Cert. no.	Due Date
Data logger With Sensor	34970A	MY44064411	QR21-0314	9-Feb-2022

- The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the longterm stability of instrument.
- This certificate is not certified any commercial transaction
- Condition of Item : normal condition , no indication for any damage or malfunction

Result of Calibration :

(✓) Without Adjustment () After Adjustment

1. Sensor Installation Diagram



Sensor Installation Details

a = 5 cm
b = 5 cm
c = 5 cm

Dimension of the chamber

W = 45 cm
H = 30 cm
D = 35 cm



Certificate No. : 21WB064

CSR No. : A047/2346

Page : 3 of 3

Result of Calibration :

2. Temperature Measurement Accuracy Test

The measurement results of the Water Bath and associates are reported in the manner as shown below

Cal point (°C)	Measured Standard Temperature At Spread Locations (°C)					Uncertainty (±°C)
	#1	#2	#3	#4	Ref.5	
44.5	44.49	44.55	44.48	44.51	44.47	0.14

3. Performance Result

The performance of the Water Bath are reported as shown below

Cal point (°C)	UUC Setting (°C)	UUC Reading (°C)	Temperature Stability (±°C)	Temperature Uniformity (°C)	Overall Variation (°C)
44.5	44.6	44.6	0.20	0.24	0.24

- UUC = Unit Under Calibration

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

... End ...

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Agilent CrossLab Compliance Services



Agilent CrossLab Compliance

Qualification Type: ICPMS-OQ

System ID: JP16511669

EQP Name: AgilentRecommended

EQP Revision: ICPMS.02.50

EQP Publish Date: March 2020

Date: February 8, 2022 11:47:17 AM
Report Type: Report

Org. Name: ALS laboratory Group (Thailand) Co., Ltd.

Org. Location: 114/1 Moo8, Kamchanawanich Rd., T.Ban Phru,
A.Hatyai, Songkhla 90250

REVIEW BY *Athanasia B.*
APPROVED BY *Kanittha H.*
NEXT CAL DATE *8/12/2023*

Date: February 8, 2022 11:47:17 AM
System ID: JP16511669

Page 1 / 34

Certificate of System Qualification

ICPMS-OQ

System ID: JP16511669
Organization Name: ALS Laboratory Group (Thailand) Co., Ltd.
Organization Location: 114/1 Moo8, Kanchanaswini Rd., T.Ban Phru, A.Hatyai, Songkhla 90250

Date: February 8, 2022 11:39:47 AM
EQP Name: Agilent/Recommended
EQP Revision: ICPMS.02.50
Overall Qualification Status: Pass

Autosampler Check

Overall Autosampler Check Test Status

Pass

Integrated Sample Introduction System (ISIS) Check

Overall Integrated Sample Introduction System (ISIS) Check Test Status

Pass

Autotune

Peakwidth Mass 7	Pass
Peakwidth Mass 89	Pass
Peakwidth Mass 205	Pass
Mass Axis 7	Pass
Mass Axis 89	Pass
Mass Axis 205	Pass
Mass 7 Sensitivity No Gas	Pass
Mass 89 Sensitivity No Gas	Pass
Mass 205 Sensitivity No Gas	Pass
Mass 59 Sensitivity He	Pass
Mass 59 Sensitivity H2	Pass
Oxide Ratio 156/140	Pass
Doubly Charged Species Ratio 70/140	Pass

Date: February 8, 2022 11:39:47 AM
System ID: JP16511669

Page 1 / 9

Overall Autotune Test Status

Pass

Background (No Gas Mode)

Setpoint Status:

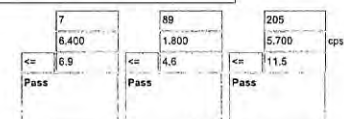
Pass

Masses (AMU):

Measured Value:

Agilent Recommended:

Status:



Overall Background (No Gas Mode) Test Status

Pass

Background (Gas Mode)

Gas Mode:

Helium

Setpoint Status:

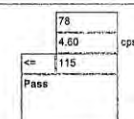
Pass

Mass (AMU):

Measured Value:

Agilent Recommended:

Status:



Gas Mode:

Hydrogen

Setpoint Status:

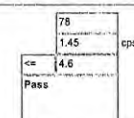
Pass

Mass (AMU):

Measured Value:

Agilent Recommended:

Status:



Overall Background (Gas Mode) Test Status

Pass

Date: February 8, 2022 11:39:47 AM
System ID: JP16511669

Page 2 / 9

20-Minute Stability (No Gas Mode)

Masses (AMU):

Stability RSD:

Agilent Recommended:

Status:



Overall 20-Minute Stability (No Gas Mode) Test Status

Pass

Date: February 8, 2022 11:39:47 AM
System ID: JP16511669

Page 3 / 9

Instrument Details

Purpose

This section describes the as found system configuration.

Details

ICP-MS 1

Manufacturer	Agilent Technologies
Name	7900
Model Number	G6403A
Installed Options	#100-H: Standard Package with Hydrogen option
Detector Type	SQ
Nebulizer	Mira Mist (G3161)
Spray Chamber	Quartz
Torch	Quartz
Sampler Cone	Ni
Skimmer Cone	Ni
Serial Number	JP16511669
Firmware Revision	4.00.02

ISIS 1

Manufacturer	Agilent Technologies
Name	ISIS3
Model Number	G6411A
Type	Peristaltic pump system
Serial Number	JP16510376

Autosampler 1

Manufacturer	Agilent Technologies
Name	SPS4
Model Number	G6410A
Serial Number	AU16351647

Date: February 8, 2022 11:39:47 AM
System ID: JP16511669

Page 4 / 9

Chiller 1

Manufacturer Agilent Technologies
Name Chiller
Model Number G3292A
Serial Number 701711328

Date: February 8, 2022 11:39:47 AM
System ID: JP16511669

Page 5 / 9

Electronic Signature

Purpose

This signature page was created and published because the ACE sign-off action was executed, which is valid for the entire document, including attachments. The ACE sign-off is an electronic signature that requires two distinct identification components: unique username and personal password. The Agilent representative who has delivered this service understands the meaning and legal status of an electronic signature. As a trained official operator, the Agilent representative has a unique password and login to access ACE and electronically sign this document. (Other e-signatures can be applied to this document using a Document Content Management or other suitable method defined in your data access and control procedures.)

Details

Full Name of Signer: Burin Ngamvijit
Logged On User Name: Burin_ngamvijit@agilent.com
Signature Creation Date: February 8, 2022
Reason for Signature: Published this original version of document

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Date: February 8, 2022 11:39:47 AM
System ID: JP16511669

Page 6 / 9

User Name: burin_ngamvijit
Hostname: ASSGKWX019
System ID: JP16511669
Print Date: February 8, 2022 11:39:49 AM

DQ HW 7900CPMS ALB Transaction log:

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
February 8, 2022 9:19:25 AM	Audit	SessionCreated	Session	None
February 8, 2022 9:19:55 AM	Start	Configuration	Session	None
February 8, 2022 9:19:55 AM	Audit	Entitlement	Licensing	User is FluidEngineer and does not require an unlock code
February 8, 2022 9:23:56 AM	Audit	Exploaded	Session	EOP details for primary technique (topMa) - File path: [ProtocolPacks\topMa\Config\wakeup02_30topMa_62.50.eap] EOP File Name: [topMa_62.50.eap] EOP Name: [AgilentRecommended]
February 8, 2022 9:24:00 AM	End	Configuration	Session	None
February 8, 2022 9:24:09 AM	Start	Qualification	Session	DQ
February 8, 2022 9:24:59 AM	Start	Execution	Autosampler Check : SP5A: Autosampler Check	None
February 8, 2022 9:24:54 AM	End	Execution	Autosampler Check : SP5A: Autosampler Check	Run Count : 1
February 8, 2022 9:24:57 AM	Start	Execution	Integrated Sample Introduction System (ISIS) Check : ISIS3: Integrated Sample Introduction System (ISIS) Check	None
February 8, 2022 10:52:47 AM	End	Execution	Integrated Sample Introduction System (ISIS) Check : ISIS3: Integrated Sample Introduction System (ISIS) Check	Run Count : 1

Page 1 / 3

Date: February 8, 2022 11:39:47 AM
System ID: JP16511669

Page 7 / 9

User Name: burin_ngamvijit
Hostname: ASSGKWX019
System ID: JP16511669
Print Date: February 8, 2022 11:39:49 AM

DQ HW 7900CPMS ALB Transaction log:

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
February 8, 2022 10:52:58 AM	Start	Execution	Autokine : G8403A: Autokine 1	None
February 8, 2022 10:56:26 AM	End	Execution	Autokine : G8403A: Autokine 1	Run Count : 1
February 8, 2022 10:56:34 AM	Start	Execution	Background (No Gas Mode) : G8403A: No Gas Mode Background 1	None
February 8, 2022 10:56:36 AM	End	Execution	Background (No Gas Mode) : G8403A: No Gas Mode Background 1	Run Count : 1
February 8, 2022 10:56:00 AM	Start	Execution	Background (Gas Mode) : G8403A: Gas Mode Background : Helium	None
February 8, 2022 10:56:22 AM	End	Execution	Background (Gas Mode) : G8403A: Gas Mode Background : Helium	Run Count : 1
February 8, 2022 10:56:24 AM	Start	Execution	Background (Gas Mode) : G8403A: Gas Mode Background : Hydrogen	None
February 8, 2022 10:59:40 AM	End	Execution	Background (Gas Mode) : G8403A: Gas Mode Background : Hydrogen	Run Count : 1
February 8, 2022 10:59:43 AM	Start	Execution	20-Minute Stability (No Gas Mode) : G8403A: 20 Minute Stability (No Gas Mode) 1	None
February 8, 2022 11:01:33 AM	End	Execution	20-Minute Stability (No Gas Mode) : G8403A: 20 Minute Stability (No Gas Mode) 1	Run Count : 1
February 8, 2022 11:07:37 AM	End	Qualification	Session	DQ
February 8, 2022 11:07:37 AM	Start	Reporting	Session	None

Page 2 / 3

Date: February 8, 2022 11:39:47 AM
System ID: JP16511669

Page 8 / 9

User Name: borin_ngamvjit
Hostname: ASSGKWX819

System ID: JP16511669
Print Date: February 8, 2022 11:38:48 AM

OQ HW 7960CPMS ALS Transaction Log:

Time	Transaction State	Activity Performed	Type of Transaction	Optional Information
February 8, 2022 11:38:19 AM	Audit	Reporting	Session	Report Generated : Certificate

ภาคผนวก จ

สำเนาหนังสืออนุญาตขึ้นทะเบียนห้องปฏิบัติการ
วิเคราะห์เอกชนจากกรมโรงงานอุตสาหกรรม

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 Method ⁽⁴⁾
22	4,4'-DDD	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
23	2,4'-DDE	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
24	4,4'-DDE	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
25	2,4'-DDT	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
26	4,4'-DDT	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
27	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
28	Endosulfan Sulfate	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
29	Endosulfan I	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
30	Endosulfan II	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
31	Endrin	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
32	Endrin Aldehyde	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
33	Formaldehyde	Distillation, Colorimetric Method ⁽³⁾
34	Free Chlorine	1) DPD Ferrous Titrimetric Method ⁽⁴⁾ 2) Iodometric Method ⁽⁴⁾
35	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
36	Heptachlor epoxide	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
37	Hexavalent Chromium	Filtration, 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	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 Method ⁽⁴⁾

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กระทรวงพาณิชย์

44 Methomyl...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
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 °C ⁽⁴⁾
55	Total Kjeldahl Nitrogen	Semi-Micro Kjeldahl Method ⁽⁴⁾
56	Total Suspended Solids	Dried at 103-105 °C ⁽⁴⁾
57	Toxaphene	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
58	Trivalent Chromium	1) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Colorimetric Method; Calculation ⁽⁴⁾
59	Zinc	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ⁽⁴⁾

น้ำได้ดื่ม 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⁾

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3 Aldrin...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
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[ghi]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⁾

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
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	Equilibrium Headspace, 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⁾

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34 Chromium (III)...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
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	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⁾


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
51 cis-1,2-Dichloroethylene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
53	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
57	Dieldrin	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⁾


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
68 Fluorene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
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	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) Cold Vapor Atomic Absorption Spectrometric Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾


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84 Methanol...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
84	Methanol	1) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾ 2) Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
85	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
86	Methyl Bromide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
87	Methylene Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
88	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
89	2-Methylnaphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
90	Methyl tert-Butyl Ether	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
91	Naphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
92	Nickel	1) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ⁽⁴⁾
93	Nitrobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ⁽⁴⁾
94	N-Nitrosodiphenylamine	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⁾


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97 Pentachlorophenol...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
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, Direct Photometric Method ⁽⁴⁾ 2) 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 ^(1,2,4)
110	TPH (C ₉ -C ₁₆)	Solvent Extraction, Gas Chromatographic Method ^(9,21)
111	TPH (C ₁₅ -C ₃₅)	Solvent Extraction, Gas Chromatographic Method ^(9,21)
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⁾

วิมล

114 1,1,2-Trichloroethane...

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และทะเบียนข้อมูลปฏิกูล

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
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⁾

จากคดี (ปตอ.ร.น.ว.) จำนวน 16 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Antimony	Isokinetic, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
2	Arsenic	Isokinetic, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾

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3 Carbon Monoxide...

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
3	Carbon Monoxide	1) Sampling Bag Non-Dispersive Infrared Method ⁽⁵⁾ 2) Non-Dispersive Infrared Method ⁽⁵⁾ 3) Instrumental Analyzer Method ⁽⁵⁾
4	Chlorine	1) Absorption Sampling, Ion Chromatographic Method ⁽⁵⁾ 2) Isokinetic Sampling, Ion Chromatographic Method ⁽⁵⁾
5	Copper	Isokinetic, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
6	Dioxins	Isokinetic Sampling, Analysis by ISO/IEC 17025 Accredited Laboratory or Analysis by Department of Industrial Works Registered Laboratory (Dioxins/Furans Analysis Approved) ⁽⁵⁾
7	Hydrogen Chloride	1) Absorption Sampling, Ion Chromatographic Method ⁽⁵⁾ 2) Isokinetic Sampling, Ion Chromatographic Method ⁽⁵⁾
8	Hydrogen Sulfide	Absorption Sampling, Iodometric Method ⁽⁵⁾
9	Lead	Isokinetic, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
10	Mercury	1) Isokinetic Sampling, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽⁵⁾ 2) Isokinetic, Digestion, Inductively Coupled Plasma Method ⁽⁵⁾
11	Opacity	Ringelmann's Method ⁽⁴⁾
12	Oxides of Nitrogen	1) Absorption Sampling, Phenoldisulfonic Acid Method ⁽⁵⁾ 2) Chemiluminescence Method ⁽⁵⁾ 3) Instrumental Analyzer Method ⁽⁵⁾
13	Sulfur Dioxide	1) Absorption Sampling, Barium-Thorin Titrimetric Method ⁽⁵⁾ 2) UV Fluorescence Method ⁽⁵⁾ 3) Instrumental Analyzer Method ⁽⁵⁾
14	Sulfuric Acid	Isokinetic Sampling, Barium-Thorin Titrimetric Method ⁽⁵⁾
15	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method ⁽⁵⁾
16	Xylene	Adsorption Sampling, Gas Chromatographic Method ⁽⁵⁾

วิมล

สิ่งปฏิกูล...

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และทะเบียนข้อมูลปฏิกูล

สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว จำนวน 35 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,23) 2) Soxhlet Extraction, Gas Chromatographic Method ^(16,22) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22,31)
2	Antimony	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,15) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,6,16) 3) Digestion, Inductively Coupled Plasma Method ^(7,13) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,16)
3	Arsenic	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,15) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,6,16) 3) Digestion, Inductively Coupled Plasma Method ^(7,13) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,16)
4	Barium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,15) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,6,16) 3) Digestion, Inductively Coupled Plasma Method ^(7,13) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,16)
5	Beryllium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,15) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,6,16) 3) Digestion, Inductively Coupled Plasma Method ^(7,13) 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,16)

วิมล

6 Cadmium...

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และทะเบียนข้อมูลปฏิกูล

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
6	Cadmium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6.15) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6.14) 3) Digestion, Inductively Coupled Plasma Method ^(7.15) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.14)
7	Chlordane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.25) 2) Soxhlet Extraction, Gas Chromatographic Method ^(10.22) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22.31)
8	Chromium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6.15) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6.14) 3) Digestion, Inductively Coupled Plasma Method ^(7.15) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.14)
9	Chromium (III)	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction, Colorimetric Method; Calculation Method ^(1.6.15.17) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Waste Extraction, Colorimetric Method; Calculation Method ^(1.6.16.17) 3) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(7.15.17) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(7.16.17)
10	Chromium (VI)	1) Waste Extraction, Colorimetric Method ^(1.6.17) 2) Alkaline Digestion, Colorimetric Method ^(1.6.17)

วิธีแปล
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กรมส่งเสริมการค้าระหว่างประเทศ
กระทรวงพาณิชย์

11 Cobalt...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
11	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6.15) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6.14) 3) Digestion, Inductively Coupled Plasma Method ^(7.15) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.14)
12	Copper	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6.15) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6.14) 3) Digestion, Inductively Coupled Plasma Method ^(7.15) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.14)
13	2,4-D	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.25) 2) Soxhlet Extraction, Gas Chromatographic Method ^(10.22) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22.31)
14	DDD	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.25) 2) Soxhlet Extraction, Gas Chromatographic Method ^(10.22) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22.31)
15	DDE	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.25) 2) Soxhlet Extraction, Gas Chromatographic Method ^(10.22) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22.31)
16	DDT	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.25)

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กระทรวงพาณิชย์

2) Soxhlet...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
17	Dieldrin	2) Soxhlet Extraction, Gas Chromatographic Method ^(10.22) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22.31) 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.25) 2) Soxhlet Extraction, Gas Chromatographic Method ^(10.22) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22.31)
18	Endrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.25) 2) Soxhlet Extraction, Gas Chromatographic Method ^(10.22) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22.31)
19	Heptachlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.25) 2) Soxhlet Extraction, Gas Chromatographic Method ^(10.22) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22.31)
20	Lead	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6.15) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6.14) 3) Digestion, Inductively Coupled Plasma Method ^(7.15) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.14)
21	Lindane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.25) 2) Soxhlet Extraction, Gas Chromatographic Method ^(10.22) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22.31)
22	Mercury	1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^(1.6.18)

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กระทรวงพาณิชย์


2) Waste Extraction...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
23	Methoxychlor	2) Waste Extraction, Thermal Decomposition Amalgamation and Atomic Absorption Spectrometric Method ^(1.6.19) 3) Waste Extraction, Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ^(1.6.20) 4) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^(2.8) 5) Thermal Decomposition Amalgamation and Atomic Absorption Spectrometric Method ^(1.9) 6) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ⁽²⁰⁾
24	Mirex	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1.9.25) 2) Soxhlet Extraction, Gas Chromatographic Method ^(10.22) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22.31)
25	Molybdenum	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6.15) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6.14) 3) Digestion, Inductively Coupled Plasma Method ^(7.15) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.14)
26	Nickel	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1.6.15) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1.6.14) 3) Digestion, Inductively Coupled Plasma Method ^(7.15) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7.14)

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กรมส่งเสริมการค้าระหว่างประเทศ
กระทรวงพาณิชย์


27 Polychlorinated...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
27	Polychlorinated biphenyls (PCBs) - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260 - 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	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(1,5,23) 2) Soxhlet Extraction, Gas Chromatographic Method ^(10,23) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22,31)


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28 Pentachlorophenol...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
28	Pentachlorophenol	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,25) 2) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22,31)
29	pH	Electrometric Method ^(23,30)
30	Selenium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,15) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,6,16) 3) Digestion, Inductively Coupled Plasma Method ^(7,15) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,16)
31	Silver	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,15) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,6,16)
32	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,15) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,6,16) 3) Digestion, Inductively Coupled Plasma Method ^(7,15) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,16)
33	Toxaphene	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^(1,9,25) 2) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^(22,31)
34	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,15) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,6,16) 3) Digestion, Inductively Coupled Plasma Method ^(7,15)



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4) Digestion...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
35	Zinc	4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,16) 1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(1,6,15) 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(1,6,16) 3) Digestion, Inductively Coupled Plasma Method ^(7,15) 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,16)


สืบ จำนวน 125 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
2	Acetone	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(14,24)
3	Aldrin	1) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
4	Anthracene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
5	Antimony	1) Digestion, Inductively Coupled Plasma Method ^(7,15) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,16)
6	Arsenic	1) Digestion, Inductively Coupled Plasma Method ^(7,15) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,16)
7	Atrazine	1) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
8	Barium	1) Digestion, Inductively Coupled Plasma Method ^(7,15) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,16)


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9 Benz(a)anthracene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
9	Benz(a)anthracene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
10	Benzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(14,24)
11	Benzo(b)fluoranthene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
12	Benzo(k)fluoranthene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
13	Benzoic acid	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
14	Benzo(a)pyrene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
15	Benzo(g,h,i)perylene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
16	Beryllium	1) Digestion, Inductively Coupled Plasma Method ^(7,15) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,16)
17	Bis(2-chloroethyl)ether	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
18	Bis(2-ethylhexyl)phthalate	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(14,24)
20	Bromoform	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(14,24)
21	Butanol	Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(12,24)
22	Butyl Benzyl Phthalate	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
23	Cadmium	1) Digestion, Inductively Coupled Plasma Method ^(7,15) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,16)
24	Carbazole	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
25	Carbon Disulfide	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(14,24)


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26 Carbon tetrachloride...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(14,24)
27	Chlordane	1) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
28	p-Chloroaniline	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(14,24)
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(14,24)
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(14,24)
32	2-Chlorophenol	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
33	Chromium	1) Digestion, Inductively Coupled Plasma Method ^(7,15) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,16)
34	Chromium (III)	1) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(7,15,17) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^(7,16,17)
35	Chromium (VI)	Alkaline Digestion, Colorimetric Method ^(8,17)
36	Chrysene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
37	Cyanide	Extraction, Distillation, Colorimetric Method ^(26,27,28)
38	2,4-D	1) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
39	DDD	1) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)

40 DDE...

สำเนา
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ผู้อำนวยการศูนย์มาตรฐานวิชาการวิเคราะห์สิ่งแวดล้อม

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
40	DDE	1) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
41	DDT	1) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
42	Dibenz(a,h)anthracene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
43	Di-n-Butyl Phthalate	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
44	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(14,24)
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(14,24)
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(14,24)
47	3,3-Dichlorobenzidine	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
48	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(14,24)
49	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(14,24)
50	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(14,24)
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(14,24)
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(14,24)
53	2,4-Dichlorophenol	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(14,24)
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(14,24)
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(14,24)

57 Dieldrin...

สำเนา
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ผู้อำนวยการศูนย์มาตรฐานวิชาการวิเคราะห์สิ่งแวดล้อม

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
57	Dieldrin	1) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
58	Diethyl Phthalate	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
59	2,4-Dimethylphenol	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
60	2,4-Dinitrophenol	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
61	2,4-Dinitrotoluene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
62	2,6-Dinitrotoluene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
63	Di-n-Octyl Phthalate	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
64	Endosulfan	1) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
65	Endrin	1) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
66	Ethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(14,24)
67	Fluoranthene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
68	Fluorene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
69	Heptachlor	1) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
70	Heptachlor Epoxide	1) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)

71 Hexachlorobenzene...

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
71	Hexachlorobenzene	1) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(14,24)
73	n-Hexane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^(14,24)
74	α-HCH	1) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
75	β-HCH	1) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
76	γ-HCH	1) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
77	Hexachlorocyclopentadiene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
78	Hexachloroethane	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
79	Indeno(1,2,3-cd)pyrene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
80	Isophorone	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^(25,31)
81	Lead	1) Digestion, Inductively Coupled Plasma Method ^(7,15) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,16)
82	Manganese	1) Digestion, Inductively Coupled Plasma Method ^(7,15) 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^(7,16)
83	Mercury	1) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽¹⁸⁾

2) Thermal...

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ลำดับที่	สารเคมี	วิธีวิเคราะห์
84	Methanol	2) Thermal Decomposition, Amalgamation, and Atomic Absorption Spectrophotometry ⁽¹³⁾ 3) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ⁽²⁰⁾ Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(12,24)
85	Methoxychlor	1) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
86	Methyl Bromide	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(14,24)
87	Methylene Chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(14,24)
88	2-methylphenol	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
89	2-Methylnaphthalene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
90	Methyl tert-Butyl Ether	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(14,24)
91	Naphthalene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
92	Nickel	1) Digestion, Inductively Coupled Plasma Method ^(7,15) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,14)
93	Nitrobenzene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
94	N-Nitrosodiphenylamine	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
95	N-Nitrosodi-n-propylamine	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
96	Polychlorinated biphenyls (PCBs) - Aroclor 1016 - Aroclor 1221 - Aroclor 1232	1) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 2) Automated Soxhlet Extraction, Gas Chromatographic Method ^(25,31)

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- Aroclor 1242...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
	- 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',5,5',6'-Heptachlorobiphenyl - 2,2',3,4,4',5,5',6'-Heptachlorobiphenyl - 2,2',3,3',4,4',5,5',6'-Nonachlorobiphenyl	
97	Pentachlorophenol	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
98	Phenanthrene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
99	Phenol	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
100	Pyrene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)

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101 Selenium...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
101	Selenium	1) Digestion, inductively Coupled Plasma Method ^(7,15) 2) Digestion, inductively Coupled Plasma/Mass Spectrometric Method ^(7,14)
102	Silver	1) Digestion, inductively Coupled Plasma Method ^(7,15) 2) Digestion, inductively Coupled Plasma/Mass Spectrometric Method ^(7,14)
103	Styrene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(14,24)
104	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(14,24)
105	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(14,24)
106	Toluene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(14,24)
107	Toxaphene	1) Soxhlet Extraction, Gas Chromatographic Method ^(10,22) 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
108	TPH (C ₅ -C ₆)	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(14,24)
109	TPH (C ₈ -C ₁₆)	1) Solvent Extraction, Gas Chromatographic Method ^(11,21) 2) Automated Soxhlet Extraction, Gas Chromatographic Method ^(21,31)
110	TPH (C ₁₆ -C ₃₃)	1) Solvent Extraction, Gas Chromatographic Method ^(11,21) 2) Automated Soxhlet Extraction, Gas Chromatographic Method ^(21,31)
111	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(14,24)
112	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(14,24)
113	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(14,24)
114	Trichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(14,24)
115	2,4,5-Trichlorophenol	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)

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116 2,4,6-Trichlorophenol...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
116	2,4,6-Trichlorophenol	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^(25,31)
117	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(14,24)
118	Vanadium	1) Digestion, inductively Coupled Plasma Method ^(7,15) 2) Digestion, inductively Coupled Plasma/Mass Spectrometric Method ^(7,14)
119	Vinyl Acetate	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(14,24)
120	Vinyl Chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(14,24)
121	m-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(14,24)
122	o-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(14,24)
123	p-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(14,24)
124	Xylene (Total)	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(14,24)
125	Zinc	1) Digestion, Inductively Coupled Plasma Method ^(7,15) 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^(7,14)

เอกสารอ้างอิง

- กระทรวงอุตสาหกรรม, ประกาศกระทรวงอุตสาหกรรม, พ.ศ. 2548. เรื่อง การกำจัดสิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว.ราชกิจจานุเบกษา. 25 มกราคม 2549. เล่มที่ 123 ตอนพิเศษ 114.
- กระทรวงอุตสาหกรรม, ประกาศกระทรวงอุตสาหกรรม, พ.ศ. 2549. เรื่อง กำหนดค่าปริมาณเคมีภัณฑ์ที่เจือปนในอากาศที่ระบายออกจากปล่องของหม้อน้ำโรงสีข้าวที่ขึ้นทะเบียนเชื้อเพลิง.ราชกิจจานุเบกษา. 4 ธันวาคม 2549. เล่มที่ 123 ตอนพิเศษ 1254.
- สมาคมวิศวกรรมสิ่งแวดล้อมแห่งประเทศไทย. คู่มือวิเคราะห์น้ำเสีย. พิมพ์ครั้งที่ 4. กรุงเทพฯ: เรือนแก้วการพิมพ์, 2547.
- APHA, AWWA, WEF. Standard Methods for the Examination of Water and Wastewater. 23rd ed. Washington, DC: APHA, 2017.
- United States Environmental Protection Agency. Standards of Performance for New Stationary Sources. 40 CFR 60. Appendix A, 2019.
- United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. SW-846, 1997.
- United States...

วิมล
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7. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Acid Digestion of Sludges and Sediments and Soils. SW-846 Method 3050B, 1996.
8. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Alkaline Digestion for Hexavalent Chromium. SW-846 Method 3060A, 1996.
9. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Separatory Funnel Liquid-Liquid Extraction. SW-846 Method 3510C, 1996.
10. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Soxhlet Extraction. SW-846 Method 3540C, 1996.
11. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Microscale Solvent Extraction (MSE). SW-846 Method 3570, 2002.
12. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Volatile Organic Compounds (VOCs) in Various Sample Matrices Using Equilibrium Headspace Analysis. SW-846 Method 5021A, 2014.
13. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Purge-and-Trap for Aqueous Samples. SW-846 Method 5030B, 1996.
14. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Closed-System Purge-and-Trap and Extraction for Volatile Organics in Soil and Waste Samples. SW-846 Method 5035, 1996.
15. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Inductively Coupled Plasma- Atomic Emission Spectrometry. SW-846 Method 6010B, 1996.
16. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Inductively Coupled Plasma-Mass Spectrometry. SW-846 Method 6020A, 2007.
17. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Chromium, Hexavalent (Colorimetric). SW-846 Method 7196A, 1992.
18. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Mercury in Solid or Semisolid Waste (Manual Cold-Vapor Technique). SW-846 Method 7471B, 2007.
19. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Mercury in Solids and Solutions by Thermal Decomposition, Amalgamation, and Atomic Absorption Spectrophotometry. SW-846 Method 7473, 2007.

(นางกาญจน์ อัครกุลกิจ)

ผู้อำนวยการศูนย์บริหารมลพิษทางอากาศ
กรมโรงงานอุตสาหกรรม
ถนนพหลโยธิน ๒๕๖๕

20. United States...

20. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Mercury in Sediment and Tissue Sample by Atomic Fluorescence Spectrometry. SW-846 Method 7474, 2007.
21. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Nonhalogenated Organics Using GC/FID. SW-846 Method 8015B, 1996.
22. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Organochlorine Pesticides by Gas Chromatography. SW-846 Method 8081B, 2007.
23. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Polychlorinated Biphenyls (PCBs) by Gas Chromatography. SW-846 Method 8082, 1996.
24. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS). SW-846 Method 8260D, 2018.
25. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS). SW-846 Method 8270E, 2018.
26. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Total and Amenable Cyanide: Distillation SW-846 Method 9010B, 1996.
27. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Cyanide Extraction Procedure for Solids and Oil. SW-846 Method 9013A, 1996.
28. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Cyanide in Waters and Extracts Using Titrimetric and Manual Spectrophotometric Procedures. SW-846 Method 9014, 2014.
29. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. pH Electrometric Measurement. SW-846 Method 9040C, 2004.
30. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Soil and Waste pH. SW-846 Method 9045D, 2004.
31. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Automated Soxhlet Extraction. SW-846 Method 3541, 1994.

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ผู้อำนวยการศูนย์บริหารมลพิษทางอากาศ
กรมโรงงานอุตสาหกรรม
ถนนพหลโยธิน ๒๕๖๕

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและประเมินผลกระทบต่อสิ่งแวดล้อม การวิจัยและพัฒนาระบบการตรวจวัด การเฝ้าระวังและติดตามผลกระทบจากมลพิษทางอากาศ



ที่ บก.๔๓๓๐(๒)/ ๒๕๕๗

กรมโรงงานอุตสาหกรรม
ถนนพหลโยธิน ๒ แขวงพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๒๕ มิถุนายน ๒๕๖๕

เรื่อง ขันทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด
อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และขณิสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๒๕ เมษายน ๒๕๖๔

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด จำนวน ๒ แผ่น

ตามที่หนังสืออ้างอิง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ขอขึ้นทะเบียน
ห้องปฏิบัติการวิเคราะห์เอกชน พร้อมรายชื่อผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ เจ้าหน้าที่ประจำ
ห้องปฏิบัติการวิเคราะห์ และรายการสารมลพิษที่จะทำการวิเคราะห์ ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป
(ประเทศไทย) จำกัด ขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน มีเลขทะเบียน ๗-๒๒๒ สดแทนที่เลขที่
๒๒๒/๑๐ หมู่ที่ ๕ ตำบลแม่ไม้ อำเภอลำปาง จังหวัดลำปาง โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์

- ๑) นายเดช ช้างชน
- ๒) นางสิริวิมล บริรักษ์
- ๓) นายสุพจน์ สลามเต๊ะ

ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๕๒
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๕๓
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๕๔

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์

- ๑) นางสาวณัฐพร บรรจงกิจ
- ๒) นางสาวณัฐพร บรรจงกิจ
- ๓) นางสาวณัฐพร บรรจงกิจ
- ๔) นายพิทยา ทองแดง
- ๕) นางอริยา สุบงกช
- ๖) ว่าที่ ร.ต.ณัฐชัย ม่วงมา
- ๗) นายวราวุธ พันพา
- ๘) นายศักดิ์รินทร์ จรัสกาย
- ๙) นายสุรศักดิ์ สากิน
- ๑๐) นางสาวพรพรรณ ภาณุตานนท์
- ๑๑) นายสุภากร ภาณุแก้ว
- ๑๒) นายสุวิทย์ดำรง โชคดีนิรันดร์

ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๕๕
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๕๖
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๕๗
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๕๘
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๕๙
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๖๐
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๖๑
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๖๒
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๖๓
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๖๔
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๖๕
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๖๖

๑๓) นายวิไล...

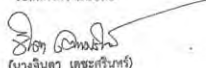
- ๑๓) นายวิไล หันไชยเนาว์
- ๑๔) นางสาวณัฐพร บรรจงกิจ
- ๑๕) นางสาวณัฐพร บรรจงกิจ
- ๑๖) นายณัฐพร บรรจงกิจ
- ๑๗) นายณัฐพร บรรจงกิจ
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- ๒๐) นายณัฐพร บรรจงกิจ
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- ๔๓) นายณัฐพร บรรจงกิจ
- ๔๔) นายณัฐพร บรรจงกิจ

ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๕๗
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๕๘
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๕๙
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๖๐
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๖๑
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๖๒
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๖๓
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ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๖๕
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๖๖
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๖๗
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๖๘
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๖๙
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ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๗๑
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๗๒
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๗๓
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ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๗๖
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๗๗
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๗๘
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๗๙
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๘๐
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๘๑
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๘๒
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๘๓
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๘๔
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๘๕
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๘๖
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๘๗
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๘๘
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๘๙
ทะเบียนเลขที่ ๗-๒๒๒-๗-๒๕๙๐

ก. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์มีไม่เสีย จำนวน ๑๔ รายการ
อากาศเสีย (ปล่อยระเหย) จำนวน ๗ รายการ และน้ำใต้ดิน จำนวน ๓ รายการ รวมทั้งสิ้นจำนวน ๒๔ รายการ
ตามสิ่งที่ส่งมาด้วย

หนังสือฉบับนี้มีอายุ ๓ ปี นับจากวันที่กรมโรงงานอุตสาหกรรมออกหนังสือ หากประสงค์จะต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อกรมโรงงานอุตสาหกรรมภายใน ๓๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ซึ่งคำขอต่ออายุดังกล่าวขอรับได้ที่กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นางจินดา เกษะกรีนทร์)
ผู้อำนวยการกองวิเคราะห์และควบคุมมลพิษ
ปฎิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม
๒๔ มิ.ย. ๒๕๖๕

กองวิจัยและเตือนภัยมลพิษโรงงาน
ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก
โทร. ๐ ๒๘๐๕ ๗๒๖๓-๓
ไปรษณีย์อิเล็กทรอนิกส์ eww@dw.mae.go.th

เอกสารแนบท้ายหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ๖-๒๒๓
ที่ ๑๓๑๐(๓)/ ๖๔๗๐ ลงวันที่ ๒๔ มิถุนายน ๒๕๖๕

ขอประชาสัมพันธ์ที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๒๔ รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Biochemical Oxygen Demand	1) 5 Day BOD Test, Membrane Electrode Method ⁽²⁾
2	Chemical Oxygen Demand	2) 5 Day BOD Test, Azide Modification Method ⁽²⁾ 1) Open Reflux, Titrimetric Method ⁽²⁾ 2) Closed Reflux, Colorimetric Method ⁽²⁾ 3) Closed Reflux, Titrimetric Method ⁽²⁾
3	Color	ADMI Weighted - Ordinate Spectrophotometric Method ⁽²⁾
4	Cyanide	Distillation, Colorimetric Method ⁽²⁾
5	Formaldehyde	Distillation, Colorimetric Method ⁽²⁾
6	Free Chlorine	DPD-Ferrous Titrimetric Method ⁽²⁾
7	Oil and Grease	Liquid-Liquid Partition-Gravimetric Method ⁽²⁾
8	pH	Electrometric Method ⁽²⁾
9	Phenols	1) Distillation, Chloroform Extraction Method ⁽²⁾ 2) Distillation, Direct Photometric Method ⁽²⁾
10	Sulfide	ZnS Precipitation, Iodometric Method ⁽²⁾
11	Temperature	Laboratory and Field Method ⁽²⁾
12	Total Dissolved Solids	Dried at 180 °C ⁽²⁾
13	Total Kjeldahl Nitrogen	Semi-Micro Kjeldahl Method ⁽²⁾
14	Total Suspended Solids	Dried at 103-105 °C ⁽²⁾

อากาศเสีย (ต่อเนื่องราย) จำนวน 7 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Carbon Monoxide	1) Sampling Bag, Non-Dispersive Infrared Method ⁽³⁾ 2) Instrumental Analyzer Method ⁽⁴⁾
2	Hydrogen Sulfide	Absorption Sampling, Iodometric Method ⁽³⁾
3	Opacity	Ringelmann's Method ^(3,4)
4	Oxide of Nitrogen	1) Absorption Sampling, Phenoldisulfonic Acid Method ⁽⁴⁾ 2) Instrumental Analyzer Method ⁽⁴⁾
5	Sulfur Dioxide	1) Absorption Sampling, Barium-Thorin Titrimetric Method ⁽³⁾ 2) Instrumental Analyzer Method ⁽⁴⁾

วิศ. สัมฤทธิ์
(นางสาววิชุดา สัมฤทธิ์)
ผู้อำนวยการ
ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก Sulfuric Acid...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
6	Sulfuric Acid	Isokinetic Sampling, Barium - Thorin Titrimetric Method ⁽⁴⁾
7	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method ⁽⁷⁾

น้ำใต้ดิน จำนวน 3 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Cyanide	Distillation, Colorimetric Method ⁽²⁾
2	pH	Electrometric Method ⁽²⁾
3	Phenols	Distillation, Direct Photometric Method ⁽²⁾

เอกสารอ้างอิง

- ธงชัย พรรณสวัสดิ์ และวิบูลย์ลักษณ์ วิสุมิศักดิ์, บรรณาธิการ. (2547) คู่มือวิเคราะห์น้ำเสีย. พิมพ์ครั้งที่ 4. กรุงเทพฯ: สมาคมวิศวกรรมสิ่งแวดล้อมแห่งประเทศไทย.
- APHA, AWWA, WEF. Standard Methods for the Examination of Water and Wastewater. 23rd ed. Washington, DC : APHA, 2017
- กระทรวงอุตสาหกรรม. ประกาศกระทรวงอุตสาหกรรม, พ.ศ. 2549. เรื่อง กำหนดค่าปริมาณเคมีภัณฑ์ที่เจือปนในอากาศที่ระบายออกจากปล่องของหม้อน้ำโรงไฟฟ้าใช้แม่เหล็บนเป็นเชื้อเพลิง.ราชกิจจานุเบกษา. 4 ธันวาคม 2549. เล่มที่ 123 ตอนพิเศษ 1254.
- กระทรวงอุตสาหกรรม. ประกาศกระทรวงอุตสาหกรรม, พ.ศ. 2549. เรื่อง กำหนดค่าปริมาณเคมีภัณฑ์ที่เจือปนในอากาศที่ระบายออกจากปล่องของหม้อน้ำโรงไฟฟ้าใช้แม่เหล็บนเป็นเชื้อเพลิง.ราชกิจจานุเบกษา. 4 ธันวาคม 2549. เล่มที่ 123 ตอนพิเศษ 1254.
- United States Environmental Protection. Standards of Performance for New Stationary Sources. 40 CFR 60. Appendix A, 2017.
- United States Environmental Protection. Standards of Performance for New Stationary Sources. 40 CFR 60. Appendix A, 2019.
- United States Environmental Protection. Standards of Performance for New Stationary Sources. 40 CFR 60. Appendix A, 2020.
- United States Environmental Protection Agency. Determination of Carbon Monoxide Emissions from Stationary Sources; Instrumental Analyzer Procedure. 40 CFR 60. Appendix A Method 10, 2017.
- United States Environmental Protection Agency. Determination of Oxide of Nitrogen Emissions from Stationary Sources; Instrumental Analyzer Procedure. 40 CFR 60. Appendix A Method 7E, 2019.
- United States Environmental Protection Agency. Determination of Sulfur Dioxide Emissions from Stationary Sources; Instrumental Analyzer Procedure. 40 CFR 60. Appendix A Method 6C, 2017.

วิศ. สัมฤทธิ์
(นางสาววิชุดา สัมฤทธิ์)
ผู้อำนวยการ
ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก
ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคตะวันออก กองวิจัยและเตือนภัยมลพิษโรงงาน กรมโรงงานอุตสาหกรรม โทร ๐ ๒๘๐๕ ๗๒๖๓-๓



ที่ ๑๓๑๐(๔)/ ๑๑๖๒๒

กรมโรงงานอุตสาหกรรม
ถนนพหลโยธินที่ ๖ เขตราชเทวี
กรุงเทพมหานคร ๑๐๔๐๐

๑๕ ตุลาคม ๒๕๖๕

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงผลการ และนิสสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน ลงวันที่ ๓๐ สิงหาคม ๒๕๖๓

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด จำนวน ๓ แผ่น

ตามหนังสือที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ขอต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๒๒๓ สถานที่ตั้งเลขที่ ๑๓๑๐(๓) หมู่ที่ ๘ ถนนพหลโยธิน ตำบลบ้านบุ อำเภอหาดใหญ่ จังหวัดสงขลา ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยไม่ต้องประกอบดังนี้

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์

นางสาวกัญญา เหมประสาพร ทะเบียนเลขที่ ๖-๒๒๓-จ-๗๒๖๖

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์

๑) นางสาวปริยา พงษ์ปาน ทะเบียนเลขที่ ๖-๒๒๓-จ-๗๒๖๘

๒) นางสาวสุวิภา พิธีรัตน์ ทะเบียนเลขที่ ๖-๒๒๓-จ-๗๒๖๙

๓) นางสาววิลา นฤมิตร ทะเบียนเลขที่ ๖-๒๒๓-จ-๗๒๗๐

๔) นางสาวชัญญา กักดี ทะเบียนเลขที่ ๖-๒๒๓-จ-๗๒๗๑

๕) นายวุฒิชัย หว่องเจริญ ทะเบียนเลขที่ ๖-๒๒๓-จ-๗๒๗๒

๖) นายณัฐศิลป์ รังษี ทะเบียนเลขที่ ๖-๒๒๓-จ-๗๒๗๓

๗) นางสาวกมลลา บัณฑิต ทะเบียนเลขที่ ๖-๒๒๓-จ-๗๒๗๔

๘) นายอภิวัฒน์ อินทะ ทะเบียนเลขที่ ๖-๒๒๓-จ-๗๒๗๕

๙) นายศิริชัย เกสียงเกิด ทะเบียนเลขที่ ๖-๒๒๓-จ-๗๒๗๖

๑๐) นายสมศักดิ์ จันทร์รงค์ ทะเบียนเลขที่ ๖-๒๒๓-จ-๗๒๗๗

๑๑) นางสาวพิชญา สุวรรณนท์ ทะเบียนเลขที่ ๖-๒๒๓-จ-๗๒๗๘

๑๒) นายปัญญา เกียรติพิริยรักษ์ ทะเบียนเลขที่ ๖-๒๒๓-จ-๗๒๗๙

๑๓) นางสาวชัญญา เพชรเนติเขต ทะเบียนเลขที่ ๖-๒๒๓-จ-๗๒๘๐

๑๔) นางสาวศศิณิกา สิงห์มาตย์กุล ทะเบียนเลขที่ ๖-๒๒๓-จ-๗๒๘๑

๑๕) นางสาวจุฑามาศ สุขสวัสดิ์ ทะเบียนเลขที่ ๖-๒๒๓-จ-๗๒๘๒

๑๖) นางสาวจันทิมา กอนทะ ทะเบียนเลขที่ ๖-๒๒๓-จ-๗๒๘๓


๑๗) นางสาวสมฤดี...

๑๗) นางสาวสมฤดี ชูบัว ทะเบียนเลขที่ ๖-๒๖๗-๖-๘๔๔๔
๑๘) นายสรวิทย์ ติเลิศ ทะเบียนเลขที่ ๖-๒๖๗-๖-๘๔๔๔
ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนไว้วิเคราะห์ในน้ำเสีย จำนวน ๒๖ รายการ
อากาศเสีย จำนวน ๑๒ รายการ รวมทั้งสิ้น ๓๘ รายการ ตามสิ่งที่ส่งมาด้วย

หนังสือฉบับนี้จะหมดอายุในวันที่ ๑๖ สิงหาคม ๒๕๖๖ หากประสงค์จะต่ออายุหนังสือขึ้น
ทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อกรมโรงงาน
อุตสาหกรรมภายใน ๓๐ วัน ก่อนวันสิ้นอายุของหนังสือขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ซึ่งคำขอ
ต่ออายุดังกล่าวขอรับได้ที่กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ


(นางนงนุช ศรีรงค์)
ผู้อำนวยการศูนย์วิจัยและเฝ้าระวังมลพิษโรงงาน
ผู้ตรวจราชการเขตภาคใต้ กรมโรงงานอุตสาหกรรม

กองวิจัยและเฝ้าระวังมลพิษโรงงาน
ศูนย์วิจัยและเฝ้าระวังมลพิษโรงงานภาคใต้
โทร. ๐ ๙๔๓๒ ๕๐๖๔๔ - ๓๓
ไปรษณีย์อิเล็กทรอนิกส์ sirw@dw.mail.go.th

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท เอแอลเอส แล็บอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ๖-๒๖๗/
ที่ ๐๓๑๐(๕)/ ๑๑ ๖ ๓ ๒ ลงวันที่ ๑๔ ตุลาคม ๒๕๖๓

ขอบข่ายสารมลพิษที่ได้รับการขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๘ รายการ
น้ำเสีย จำนวน ๒๖ รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Arsenic	Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[2]
2	Barium	Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[2]
3	Biochemical Oxygen Demand	1) 5-Day BOD Test, Azide Modification Method ^[2] 2) 5-Day BOD Test, Membrane Electrode Method ^[2]
4	Cadmium	Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[2]
5	Chemical Oxygen Demand	Closed Reflux, Colorimetric/Titrimetric Method ^[2]
6	Chromium	Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[2]
7	Color	ADMI Weighted-Ordinate Spectrophotometric Method ^[2]
8	Copper	Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[2]
9	Cyanide	Distillation, Colorimetric Method ^[2]
10	Formaldehyde	Distillation, Colorimetric Method ^[2]
11	Free Chlorine	DPD Ferrous Titrimetric Method ^[2]
12	Hexavalent Chromium	Filtration, Colorimetric Method ^[2]
13	Lead	Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[2]
14	Manganese	Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[2]
15	Mercury	Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[2]

(นางนงนุช ศรีรงค์)
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ภาคใต้ กรมโรงงานอุตสาหกรรม
16 Nickel

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
16	Nickel	Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[2]
17	Oil and Grease	Liquid-Liquid, Partition-Gravimetric Method ^[2]
18	pH	Electrometric Method ^[2]
29	Phenol	Distillation, Direct Photometric Method ^[2]
20	Selenium	Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[2]
21	Sulfide	ZnS Precipitation, Iodometric Method ^[2]
22	Temperature	Laboratory and Field Methods ^[2]
23	Total Dissolved Solids	Dried at 180 °C ^[2]
24	Total Suspended Solids	Dried at 103-105 °C ^[2]
25	Trivalent Chromium	Digestion, Inductively Coupled Plasma/Mass Spectrometric Method, Colorimetric Method, Calculation ^[2]
26	Zinc	Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[2]

อากาศเสีย (ปล่องระบาย) จำนวน 12 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Antimony	Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1]
2	Arsenic	Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1]
3	Carbon Monoxide	Sampling Bag, Non-Dispersive Infrared Method ^[1]
4	Copper	Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1]
5	Dioxins	Isokinetic Sampling, Analysis by ISO/IEC 17025 Accredited Laboratory ^[1]
6	Hydrogen Sulfide	Absorption, Iodometric Method ^[1]
7	Lead	Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1]

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8 Opacity...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
8	Opacity	Ringelmann's Method ^[1]
9	Oxides of Nitrogen	Absorption Sampling, Phenoldisulfonic Acid Method ^[1]
10	Sulfur Dioxide	Absorption Sampling, Barium-Thorin Titrimetric Method ^[1]
11	Sulfuric Acid	Isokinetic Sampling, Barium-Thorin Titrimetric Method ^[1]
12	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method ^[1]

เอกสารอ้างอิง

- กระทรวงอุตสาหกรรม, ประกาศกระทรวงอุตสาหกรรม, พ.ศ. 2549 เรื่อง กำหนดค่าปริมาณ
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ราชกิจจานุเบกษา, 4 ธันวาคม 2549, เล่มที่ 123 ตอนพิเศษ 125ง
- APHA, AWWA, WEF, Standard Methods for the Examination of Water and
Wastewater, 23rd ed, Washington, DC: APHA, 2017
- United States Environmental Protection Agency Standards of Performance for
New Stationary Sources, 40 CFR 60, Appendix A, 2013

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