ภาคผนวก ค

ใบรับรองผลการตรวจวัดและวิเคราะห์คุณภาพสิ่งแวดล้อม

ใบรับรองผลการตรวจวัดและวิเคราะห์คุณภาพอากาศ
จากปล่องระบายอากาศ

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STACK EMISSION ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	**REFERENCE NO.**	: 225003-STK-2509-0230
SAMPLING BY	: SECOT Co., Ltd.	**REGISTRATION NO.**	: -
SAMPLING DATE	: 16/09/2025	**SAMPLING TIME**	: 09.00-09.30 a.m.
RECEIVED DATE	: 17/09/2025	**ANALYTICAL DATE**	: 23/09/2025
REPORT DATE	: 29/09/2025	**SAMPLE CONDITION**	: Normal
SOURCE DESCRIPTION	: Asphalt Tank	**SITE OPERATOR**	: Mr. Pisanu Seenampeng
STACK LOCATION	: Tank Free Vent of Asphalt Tank	**REGISTRATION NO.**	: -

STACK DESCRIPTION

Height	: 5.0	m	**Flow Rate**[1]	: 135.00	Ncu.m/min
Diameter	: 0.46	m	**Excess Oxygen**	: 20.50	%
Temperature	: 32.00	^{o}C	**Moisture Content**	: 3.79	%
Gas Velocity	: 14.47	m/s			

PARAMETER	UNIT	ND (Non-detectable)	RESULT[1]	ASSIGN VALUE[2]	STANDARD	REFERENCE METHOD
Total Hydrocarbon (THC)	ppm	<0.10	20.95	125	-	Flame Ionization Detector

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

(Miss Narisa Poowasanpetch)

Technical Management Team

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

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

3. [1] At standard pressure of 760 mmHg and temperature of 25 ^{o}C, dry basis.

4. [2/] Assigned value in Environmental Impact Assessment Report (EIA) No.4 of Star Petroleum Refining Public Co., Ltd., Marine Terminal, Letter No. อก 5102.3.1/1266 dated May 7, 2019.

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STACK EMISSION ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	**REFERENCE NO.**	: 225003-STK-2509-0230
SAMPLING BY	: SECOT Co., Ltd.	**REGISTRATION NO.**	: -
SAMPLING DATE	: 16/09/2025	**SAMPLING TIME**	: 09.00-09.30 a.m.
RECEIVED DATE	: 17/09/2025	**ANALYTICAL DATE**	: 26/09/2025
REPORT DATE	: 29/09/2025	**SAMPLE CONDITION**	: Normal
SOURCE DESCRIPTION	: Asphalt Tank	**SITE OPERATOR**	: Mr. Pisanu Seenampeng
STACK LOCATION	: Tank Free Vent of Asphalt Tank	**REGISTRATION NO.**	: -

STACK DESCRIPTION

Height	: 5.0	m	**Flow Rate**[1]	: 135.00	Ncu.m/min
Diameter	: 0.46	m	**Excess Oxygen**	: 20.50	%
Temperature	: 32.00	^{o}C	**Moisture Content**	: 3.79	%
Gas Velocity	: 14.47	m/s			

PARAMETER	UNIT	ND (Non-detectable)	RESULT[1]	ASSIGN VALUE[2]	STANDARD	REFERENCE METHOD
Hydrogen Sulfide (H_2S)	ppm	<0.30	ND	0.75	-	US. EPA Method 16

Sudaporn S.

(Miss Sudaporn Soonthorn)

Analyst

Narisa Poowasanpetch

(Miss Narisa Poowasanpetch)

Technical Management Team

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3. [1] At standard pressure of 760 mmHg and temperature of 25 ^{o}C, dry basis.

4. [2/] Assigned value in Environmental Impact Assessment Report (EIA) No.4 of Star Petroleum Refining Public Co., Ltd., Marine Terminal, Letter No. อก 5102.3.1/1266 dated May 7, 2019.

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	**REQUEST SERVICE No.**	: 0030/69
SAMPLING BY	: SECOT Co., Ltd.	**REGISTRATION No.**	: ว-239
SAMPLING DATE	: 08/01/2026	**SAMPLING METHOD**	: Grab
RECEIVED DATE	: 09/01/2026	**SAMPLING TIME**	: 12:24
ANALYTICAL DATE	: 09-17/01/2026	**SITE OPERATOR**	: Mr. Baworn Deechaiya
REPORT DATE	: 17/01/2026		: ว-239-จ-0005
SAMPLE CONDITION	: เหลืองใสมีตะกอน	**FILE CODE**	: 226003_Marine_January

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION
				Before discharging to Refinery WWTP
pH	-	4500-H^+ B	< 0.10	7.53
Total Dissolved Solids	mg/l	2540 C	< 25	452
Suspended Solids	mg/l	2540 D	< 2.5	18
Sulfide as H_2S	mg/l	4500-S^{2-} F	< 0.20	ND
Fat Oil & Grease	mg/l	5520 B	< 2.0	ND
BOD_5	mg/l	5210 B	< 1.0	54.0
TKN	mg/l	4500-N_{org} B	< 0.20	35.9

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 24th ED.,2023 (AWWA,APHA, WEF)

(Miss Pornnapa Budthum)
Analyst
REG. NO. ว-239-จ-0018

(Miss Khemchuda Insorn)
Technical Management Team
REG. NO. ว-239-ค-0005

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

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	**REQUEST SERVICE No.**	: 0207/69
SAMPLING BY	: SECOT Co., Ltd.	**REGISTRATION No.**	: ว-239
SAMPLING DATE	: 06/02/2026	**SAMPLING METHOD**	: Grab
RECEIVED DATE	: 07/02/2026	**SAMPLING TIME**	: 11:20
ANALYTICAL DATE	: 07-17/02/2026	**SITE OPERATOR**	: Mr. Jeerawat Khothamhan
REPORT DATE	: 17/02/2026		: ว-239-จ-0025
SAMPLE CONDITION	: เหลืองขุ่นมีตะกอน	**FILE CODE**	: 226003_Marine_February

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION
				Before discharging to Refinery WWTP
pH	-	4500-H^+ B	< 0.10	7.26
Total Dissolved Solids	mg/l	2540 C	< 25	374
Suspended Solids	mg/l	2540 D	< 2.5	13
Sulfide as H_2S	mg/l	4500-S^{2-} F	< 0.20	0.22
Fat Oil & Grease	mg/l	5520 B	< 2.0	ND
BOD_5	mg/l	5210 B	< 1.0	67.4
TKN	mg/l	4500-N_{org} B	< 0.20	41.1

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 24th ED.,2023 (AWWA,APHA, WEF)

(Miss Pornnapa Budthum)
Analyst
REG. NO. ว-239-จ-0018

(Miss Khemchuda Insorn)
Technical Management Team
REG. NO. ว-239-ค-0005

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	**REQUEST SERVICE No.**	: 0403/69
SAMPLING BY	: SECOT Co., Ltd.	**REGISTRATION No.**	: ว-239
SAMPLING DATE	: 06/03/2026	**SAMPLING METHOD**	: Grab
RECEIVED DATE	: 07/03/2026	**SAMPLING TIME**	: 11:43
ANALYTICAL DATE	: 07-17/03/2026	**SITE OPERATOR**	: Mr. Jeerawat Khothamhan
REPORT DATE	: 17/03/2026		: ว-239-จ-0025
SAMPLE CONDITION	: เหลืองขุ่น	**FILE CODE**	: 226003_Marine_March

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION
				Before discharging to Refinery WWTP
pH	-	4500-H^+ B	< 0.10	7.53
Total Dissolved Solids	mg/l	2540 C	< 25	352
Suspended Solids	mg/l	2540 D	< 2.5	22
Sulfide as H_2S	mg/l	4500-S^{2-} F	< 0.20	ND
Fat Oil & Grease	mg/l	5520 B	< 2.0	ND
BOD_5	mg/l	5210 B	< 1.0	69.1
TKN	mg/l	4500-N_{org} B	< 0.20	33.8

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 24th ED.,2023 (AWWA,APHA, WEF)

(Miss Pornnapa Budthum)
Analyst
REG. NO. ว-239-จ-0018

(Miss Khemchuda Insorn)
Technical Management Team
REG. NO. ว-239-ค-0005

Remark : 1. Reported analysis refers to submitted sample only.
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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	**REQUEST SERVICE No.**	: 0555/69
SAMPLING BY	: SECOT Co., Ltd.	**REGISTRATION No.**	: ว-239
SAMPLING DATE	: 03/04/2026	**SAMPLING METHOD**	: Grab
RECEIVED DATE	: 04/04/2026	**SAMPLING TIME**	: 11:20
ANALYTICAL DATE	: 04-20/04/2026	**SITE OPERATOR**	: Mr. Aniwat Pimwanna
REPORT DATE	: 20/04/2026		: ว-239-จ-0007
SAMPLE CONDITION	: เหลืองขุ่น	**FILE CODE**	: 226003_Marine_April

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION
				Before discharging to Refinery WWTP
pH	-	4500-H^+ B	< 0.10	7.19
Total Dissolved Solids	mg/l	2540 C	< 25	390
Suspended Solids	mg/l	2540 D	< 2.5	20
Sulfide as H_2S	mg/l	4500-S^{2-} F	< 0.20	ND
Fat Oil & Grease	mg/l	5520 B	< 2.0	ND
BOD_5	mg/l	5210 B	< 1.0	57.7
TKN	mg/l	4500-N_{org} B	< 0.20	38.2

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 24th ED.,2023 (AWWA,APHA, WEF)

(Miss Pornnapa Budthum)
Analyst
REG. NO. ว-239-จ-0018

(Miss Khemchuda Insorn)
Technical Management Team
REG. NO. ว-239-ค-0005

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	**REQUEST SERVICE No.**	: 0766/69
SAMPLING BY	: SECOT Co., Ltd.	**REGISTRATION No.**	: ว-239
SAMPLING DATE	: 08/05/2026	**SAMPLING METHOD**	: Grab
RECEIVED DATE	: 09/05/2026	**SAMPLING TIME**	: 11:05
ANALYTICAL DATE	: 09-16/05/2026	**SITE OPERATOR**	: Miss Thipsuda Wannakran
REPORT DATE	: 18/05/2026		: ว-239-จ-0027
SAMPLE CONDITION	: เหลืองขุ่น	**FILE CODE**	: 226003_Marine_May

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION
				Before discharging to Refinery WWTP
pH	-	4500-H^+ B	< 0.10	6.63
Total Dissolved Solids	mg/l	2540 C	< 25	444
Suspended Solids	mg/l	2540 D	< 2.5	27
Sulfide as H_2S	mg/l	4500-S^{2-} F	< 0.20	ND
Fat Oil & Grease	mg/l	5520 B	< 2.0	ND
BOD_5	mg/l	5210 B	< 1.0	82.3
TKN	mg/l	4500-N_{org} B	< 0.20	66.0

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 24th ED.,2023 (AWWA,APHA, WEF)

(Miss Pornnapa Budthum)
Analyst
REG. NO. ว-239-จ-0018

(Miss Khemchuda Insorn)
Technical Management Team
REG. NO. ว-239-ค-0005

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	**REQUEST SERVICE No.**	: 0965/69
SAMPLING BY	: SECOT Co., Ltd.	**REGISTRATION No.**	: ว-239
SAMPLING DATE	: 05/06/2026	**SAMPLING METHOD**	: Grab
RECEIVED DATE	: 06/06/2026	**SAMPLING TIME**	: 11:00
ANALYTICAL DATE	: 06-17/06/2026	**SITE OPERATOR**	: Miss Thipsuda Wannakran
REPORT DATE	: 17/06/2026		: ว-239-จ-0027
SAMPLE CONDITION	: เหลืองมีตะกอน	**FILE CODE**	: 226003_Marine_June

PARAMETER	UNIT	ANALYSIS METHODS	ND (non-detectable)	STATION
				Before discharging to Refinery WWTP
pH	-	4500-H^+ B	< 0.10	5.80
Total Dissolved Solids	mg/l	2540 C	< 25	484
Suspended Solids	mg/l	2540 D	< 2.5	8.0
Sulfide as H_2S	mg/l	4500-S^{2-} F	< 0.20	ND
Fat Oil & Grease	mg/l	5520 B	< 2.0	ND
BOD_5	mg/l	5210 B	< 1.0	19.6
TKN	mg/l	4500-N_{org} B	< 0.20	32.3

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 24th ED.,2023 (AWWA,APHA, WEF)

(Miss Pornnapa Budthum)
Analyst
REG. NO. ว-239-จ-0018

(Miss Khemchuda Insorn)
Technical Management Team
REG. NO. ว-239-ค-0005

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	**REQUEST SERVICE No.**	: 0276/69
SAMPLING BY	: SECOT Co., Ltd.	**REGISTRATION No.**	: -
SAMPLING DATE	: 16/02/2026	**SAMPLING METHOD**	: Integrate
RECEIVED DATE	: 17/02/2026	**SAMPLING TIME**	: 10:38
ANALYTICAL DATE	: 17-26/02/2026	**SITE OPERATOR**	: Mr. Baworn Deechaiya
REPORT DATE	: 26/02/2026		:
SAMPLE CONDITION	: ใส	**FILE CODE**	: 226003_CW_February

PARAMETER	UNITS	ANALYSIS METHODS	ND (non-detectable)	SATATION 500 เมตรด้านทิศเหนือ ของ SPM (ที่ระดับ 1 เมตร)	STANDARD[1/]
Depth	m.	Measurement	-	21.7	-
Temperature	^{o}C	2550 B	< 0.5	29.1	△≤ 2
Transparency	m.	Secchi Disc	-	3.5	△≤ 10 %
pH	-	4500-H^{+} B	< 0.10	7.78	7.0-8.5
Fat Oil & Grease	mg/l	5520 B	< 2.0	ND	-
Fat Oil & Grease	-	Visual Testing	-	NV	NV
Suspended Solid (SS)	mg/l	2540 D	< 2.5	5.2	[2/]
Ammonia Nitrogen	µg/l	4500-NH_3 F	< 10.0	ND	-
Dissolved Oxygen	mg/l	4500-O G	< 0.10	5.46	≥ 4
Salinity	ppt	2520 B	< 0.10	25.7	△≤ 10 %
Total Petroleum Hydrocarbon	µg/l	IOC/GGE(MSI)-III/3	< 0.10	ND	≤ 5
TOC*	mg/l	5310 B	< 0.01	1.85	-
Arsenic (As)	µg/l	3114 C	< 0.10	0.62	≤ 10
Nickel (Ni)	µg/l	3113 B	< 5.00	ND	-
Vanadium (V)	µg/l	3120 B	< 10.00	ND	-

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 24th ED.,2023 (AWWA,APHA, WEF)

REFERENCE : Intergovermental Occanographic Commission of UNESCO (IOC),1981

(Miss Pornnapa Budthum)
Analyst

(Miss Khemchuda Insorn)
Technical Management Team

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

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3. [1/] Notification of the National Environmental Board B.E.2564 (2021) (Class 5).

△ : Change from natural condition, ≤ : Not more than, NV : Not visible, ≥ : Not less than.

[2/] The results should not be changed by more than the sum of daily average and the standard diviation.

Daily average was calculated from hourly measurement or at least 5 samples taken at equal time interval within one day.

4. *TOC analysis was performed by The Office of Public Health and Environmental Technology Services, Faculty of Public Health, Mahidol University.

5. - Not available .

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	**REQUEST SERVICE No**	: 0276/69
SAMPLING BY	: SECOT Co., Ltd.	**REGISTRATION No.**	: -
SAMPLING DATE	: 16/02/2026	**SAMPLING METHOD**	: Integrate
RECEIVED DATE	: 17/02/2026	**SAMPLING TIME**	: 10:58
ANALYTICAL DATE	: 17-26/02/2026	**SITE OPERATOR**	: Mr. Baworn Deechaiya
REPORT DATE	: 26/02/2026		: -
SAMPLE CONDITION	: ใส	**FILE CODE**	: 226003_CW_February

PARAMETER	UNITS	ANALYSIS METHODS	ND (non-detectable)	SATATION 500 เมตรด้านทิศใต้ ของ SPM (ที่ระดับ 1 เมตร)	STANDARD 1/
Depth	m.	Measurement	-	27.7	-
Temperature	^{o}C	2550 B	< 0.5	28.9	△≤ 2
Transparency	m.	Secchi Disc	< 0.10	3.5	△≤ 10 %
pH	-	4500-H^{+} B	-	7.73	7.0-8.5
Fat Oil & Grease	mg/l	5520 B	< 2.0	ND	-
Fat Oil & Grease	-	Visual Testing	-	NV	NV
Suspended Solid (SS)	mg/l	2540 D	< 2.5	3.2	2/
Ammonia Nitrogen	µg/l	4500-NH_3 F	< 10.0	ND	-
Dissolved Oxygen	mg/l	4500-O G	< 0.10	5.25	≥ 4
Salinity	ppt	2520 B	< 0.10	33.2	△≤ 10 %
Total Petroleum Hydrocarbon	µg/l	IOC/GGE(MSI)-III/3	< 0.10	ND	≤ 5
TOC*	mg/l	5310 B	< 0.01	1.48	-
Arsenic (As)	µg/l	3114 C	< 0.10	0.84	≤ 10
Nickel (Ni)	µg/l	3113 B	< 5.00	ND	-
Vanadium (V)	µg/l	3120 B	< 10.00	ND	-

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 24th ED.,2023 (AWWA,APHA, WEF)

REFERENCE : Intergovermental Occanographic Commission of UNESCO (IOC),1981

(Miss Pornnapa Budthum)
Analyst

(Miss Khemchuda Insorn)
Technical Management Team

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

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3. 1/ Notification of the National Environmental Board B.E.2564 (2021) (Class 5).

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4. *TOC analysis was performed by The Office of Public Health and Environmental Technology Services, Faculty of Public Health, Mahidol University.

5. - Not available .

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	**REQUEST SERVICE No**	: 0276/69
SAMPLING BY	: SECOT Co., Ltd.	**REGISTRATION No.**	: -
SAMPLING DATE	: 16/02/2026	**SAMPLING METHOD**	: Integrate
RECEIVED DATE	: 17/02/2026	**SAMPLING TIME**	: 11:14
ANALYTICAL DATE	: 17-26/02/2026	**SITE OPERATOR**	: Mr. Baworn Deechaiya
REPORT DATE	: 26/02/2026		: -
SAMPLE CONDITION	: ใส	**FILE CODE**	: 226003_CW_February

PARAMETER	UNITS	ANALYSIS METHODS	ND (non-detectable)	SATATION 500 เมตรด้านทิศตะวันออก ของ SPM (ที่ระดับ 1 เมตร)	STANDARD 1/
Depth	m.	Measurement	-	25.6	-
Temperature	^{o}C	2550 B	< 0.5	29.3	△≤ 1
Transparency	m.	Secchi Disc	-	3.5	△≤ 10 %
pH	-	4500-H^{+} B	< 0.10	8.14	7.0-8.5
Fat Oil & Grease	mg/l	5520 B	< 2.0	ND	-
Fat Oil & Grease	-	Visual Testing	-	NV	NV
Suspended Solid (SS)	mg/l	2540 D	< 2.5	3.2	2/
Ammonia Nitrogen	µg/l	4500-NH_3 F	< 10.0	ND	-
Dissolved Oxygen	mg/l	4500-O G	< 0.10	5.68	≥ 4
Salinity	ppt	2520 B	< 0.10	30.7	△≤ 10 %
Total Petroleum Hydrocarbon	µg/l	IOC/GGE(MSI)-III/3	< 0.10	ND	≤ 0.5
TOC*	mg/l	5310 B	< 0.01	1.47	-
Arsenic (As)	µg/l	3114 C	< 0.10	1.00	≤ 10
Nickel (Ni)	µg/l	3113 B	< 5.00	ND	-
Vanadium (V)	µg/l	3120 B	< 10.00	ND	-

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 24th ED.,2023 (AWWA,APHA, WEF)

REFERENCE : Intergovermental Occanographic Commission of UNESCO (IOC),1981

(Miss Pornnapa Budthum)
Analyst

(Miss Khemchuda Insorn)
Technical Management Team

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5. - Not available .

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	**REQUEST SERVICE No**	: 0276/69
SAMPLING BY	: SECOT Co., Ltd.	**REGISTRATION No.**	: -
SAMPLING DATE	: 16/02/2026	**SAMPLING METHOD**	: Integrate
RECEIVED DATE	: 17/02/2026	**SAMPLING TIME**	: 10:46
ANALYTICAL DATE	: 17-26/02/2026	**SITE OPERATOR**	: Mr. Baworn Deechaiya
REPORT DATE	: 26/02/2026		: -
SAMPLE CONDITION	: ใส	**FILE CODE**	: 226003_CW_February

PARAMETER	UNITS	ANALYSIS METHODS	ND (non-detectable)	SATATION 500 เมตรด้านทิศตะวันตก ของ SPM (ที่ระดับ 1 เมตร)	STANDARD [1/]
Depth	m.	Measurement	-	24.4	-
Temperature	^{o}C	2550 B	< 0.5	29.4	△≤ 2
Transparency	m.	Secchi Disc	-	3.5	△≤ 10 %
pH	-	4500-H^{+} B	< 0.10	8.17	7.0-8.5
Fat Oil & Grease	mg/l	5520 B	< 2.0	ND	-
Fat Oil & Grease	-	Visual Testing	-	NV	NV
Suspended Solid (SS)	mg/l	2540 D	< 2.5	12.4	[2/]
Ammonia Nitrogen	µg/l	4500-NH_3 F	< 10.0	ND	-
Dissolved Oxygen	mg/l	4500-O G	< 0.10	5.31	≥ 4
Salinity	ppt	2520 B	< 0.10	25.9	△≤ 10 %
Total Petroleum Hydrocarbon	µg/l	IOC/GGE(MSI)-III/3	< 0.10	ND	≤ 5.0
TOC*	mg/l	5310 B	< 0.01	1.33	-
Arsenic (As)	µg/l	3114 C	< 0.10	0.84	≤ 10
Nickel (Ni)	µg/l	3113 B	< 5.00	ND	-
Vanadium (V)	µg/l	3120 B	< 10.00	ND	-

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 24th ED.,2023 (AWWA,APHA, WEF)

REFERENCE : Intergovermental Occanographic Commission of UNESCO (IOC),1981

(Miss Pornnapa Budthum)
Analyst

(Miss Khemchuda Insorn)
Technical Management Team

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5. - Not available .

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	**REQUEST SERVICE No.**	: 0351/69
SAMPLING BY	: SECOT Co., Ltd.	**REGISTRATION No.**	: -
SAMPLING DATE	: 27/02/2026	**SAMPLING METHOD**	: Integrate
RECEIVED DATE	: 28/02/2026	**SAMPLING TIME**	: 14:25
ANALYTICAL DATE	: 28/02/2026-13/03/2026	**SITE OPERATOR**	: Mr. Aniwat Pimwanna
REPORT DATE	: 19/03/2026		: -
SAMPLE CONDITION	: เหลืองใส	**FILE CODE**	: 226003_CW_February

PARAMETER	UNITS	ANALYSIS METHODS	ND (non-detectable)	SATATION 500 เมตรด้านทิศเหนือ ของ SPM (ที่ระดับ 1 เมตร)	STANDARD[1/]
Depth	m.	Measurement	-	24.5	-
Temperature	^{o}C	2550 B	< 0.5	30.0	△≤ 2
Transparency	m.	Secchi Disc	-	3.0	△≤ 10 %
pH	-	4500-H^{+} B	< 0.10	7.47	7.0-8.5
Fat Oil & Grease	mg/l	5520 B	< 2.0	ND	-
Fat Oil & Grease	-	Visual Testing	-	NV	NV
Suspended Solid (SS)	mg/l	2540 D	< 2.5	< 2.5	[2/]
Ammonia Nitrogen	µg/l	4500-NH_3 F	< 10.0	ND	-
Dissolved Oxygen	mg/l	4500-O G	< 0.10	6.50	≥ 4
Salinity	ppt	2520 B	< 0.10	33.1	△≤ 10 %
Total Petroleum Hydrocarbon	µg/l	IOC/GGE(MSI)-III/3	< 0.10	0.48	≤ 5
TOC*	mg/l	5310 B	< 0.01	24.91	-
Arsenic (As)	µg/l	3114 C	< 0.10	1.29	≤ 10
Nickel (Ni)	µg/l	3113 B	< 5.00	ND	-
Vanadium (V)	µg/l	3120 B	< 10.00	ND	-

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 24th ED.,2023 (AWWA,APHA, WEF)

REFERENCE : Intergovermental Oceanographic Commission of UNESCO (IOC),1981

(Miss Pornnapa Budthum)
Analyst

(Miss Khemchuda Insorn)
Technical Management Team

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	**REQUEST SERVICE No**	: 0351/69
SAMPLING BY	: SECOT Co., Ltd.	**REGISTRATION No.**	: -
SAMPLING DATE	: 27/02/2026	**SAMPLING METHOD**	: Integrate
RECEIVED DATE	: 28/02/2026	**SAMPLING TIME**	: 14:51
ANALYTICAL DATE	: 28/02/2026-13/03/2026	**SITE OPERATOR**	: Mr. Aniwat Pimwanna
REPORT DATE	: 19/03/2026		: -
SAMPLE CONDITION	: เหลืองใส	**FILE CODE**	: 226003_CW_February

PARAMETER	UNITS	ANALYSIS METHODS	ND (non-detectable)	SATATION 500 เมตรด้านทิศใต้ ของ SPM (ที่ระดับ 1 เมตร)	STANDARD[1/]
Depth	m.	Measurement	-	26.7	-
Temperature	^{o}C	2550 B	< 0.5	29.5	△≤ 2
Transparency	m.	Secchi Disc	< 0.10	3.0	△≤ 10 %
pH	-	4500-H^{+} B	-	8.11	7.0-8.5
Fat Oil & Grease	mg/l	5520 B	< 2.0	ND	-
Fat Oil & Grease	-	Visual Testing	-	NV	NV
Suspended Solid (SS)	mg/l	2540 D	< 2.5	< 2.5	[2/]
Ammonia Nitrogen	µg/l	4500-NH_3 F	< 10.0	ND	-
Dissolved Oxygen	mg/l	4500-O G	< 0.10	6.25	≥ 4
Salinity	ppt	2520 B	< 0.10	33.8	△≤ 10 %
Total Petroleum Hydrocarbon	µg/l	IOC/GGE(MSI)-III/3	< 0.10	ND	≤ 5
TOC*	mg/l	5310 B	< 0.01	1.41	-
Arsenic (As)	µg/l	3114 C	< 0.10	1.50	≤ 10
Nickel (Ni)	µg/l	3113 B	< 5.00	ND	-
Vanadium (V)	µg/l	3120 B	< 10.00	ND	-

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 24th ED.,2023 (AWWA,APHA, WEF)

REFERENCE : Intergovermental Occanographic Commission of UNESCO (IOC),1981

(Miss Pornnapa Budthum)
Analyst

(Miss Khemchuda Insorn)
Technical Management Team

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	**REQUEST SERVICE No**	: 0351/69
SAMPLING BY	: SECOT Co., Ltd.	**REGISTRATION No.**	: -
SAMPLING DATE	: 27/02/2026	**SAMPLING METHOD**	: Integrate
RECEIVED DATE	: 28/02/2026	**SAMPLING TIME**	: 15:00
ANALYTICAL DATE	: 28/02/2026-13/03/2026	**SITE OPERATOR**	: Mr. Aniwat Pimwanna
REPORT DATE	: 19/03/2026		: -
SAMPLE CONDITION	: เหลืองใส	**FILE CODE**	: 226003_CW_February

PARAMETER	UNITS	ANALYSIS METHODS	ND (non-detectable)	SATATION 500 เมตรด้านทิศตะวันออก ของ SPM (ที่ระดับ 1 เมตร)	STANDARD 1/
Depth	m.	Measurement	-	25.8	-
Temperature	°C	2550 B	< 0.5	29.6	△≤ 1
Transparency	m.	Secchi Disc	-	4.0	△≤ 10 %
pH	-	4500-H^+ B	< 0.10	8.14	7.0-8.5
Fat Oil & Grease	mg/l	5520 B	< 2.0	ND	-
Fat Oil & Grease	-	Visual Testing	-	NV	NV
Suspended Solid (SS)	mg/l	2540 D	< 2.5	< 2.5	2/
Ammonia Nitrogen	µg/l	4500-NH_3 F	< 10.0	ND	-
Dissolved Oxygen	mg/l	4500-O G	< 0.10	6.29	≥ 4
Salinity	ppt	2520 B	< 0.10	27.6	△≤ 10 %
Total Petroleum Hydrocarbon	µg/l	IOC/GGE(MSI)-III/3	< 0.10	ND	≤ 0.5
TOC*	mg/l	5310 B	< 0.01	1.58	-
Arsenic (As)	µg/l	3114 C	< 0.10	1.31	≤ 10
Nickel (Ni)	µg/l	3113 B	< 5.00	ND	-
Vanadium (V)	µg/l	3120 B	< 10.00	ND	-

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 24th ED.,2023 (AWWA,APHA, WEF)

REFERENCE : Intergovermental Occanographic Commission of UNESCO (IOC),1981

(Miss Pornnapa Budthum)
Analyst

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Technical Management Team

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	**REQUEST SERVICE No**	: 0351/69
SAMPLING BY	: SECOT Co., Ltd.	**REGISTRATION No.**	: -
SAMPLING DATE	: 27/02/2026	**SAMPLING METHOD**	: Integrate
RECEIVED DATE	: 28/02/2026	**SAMPLING TIME**	: 14:40
ANALYTICAL DATE	: 28/02/2026-13/03/2026	**SITE OPERATOR**	: Mr. Aniwat Pimwanna
REPORT DATE	: 19/03/2026		: -
SAMPLE CONDITION	: เหลืองใส	**FILE CODE**	: 226003_CW_February

PARAMETER	UNITS	ANALYSIS METHODS	ND (non-detectable)	SATATION 500 เมตรด้านทิศตะวันตก ของ SPM (ที่ระดับ 1 เมตร)	STANDARD[1/]
Depth	m.	Measurement	-	27.2	-
Temperature	^{o}C	2550 B	< 0.5	29.7	△≤ 2
Transparency	m.	Secchi Disc	-	2.0	△≤ 10 %
pH	-	4500-H^{+} B	< 0.10	8.01	7.0-8.5
Fat Oil & Grease	mg/l	5520 B	< 2.0	ND	-
Fat Oil & Grease	-	Visual Testing	-	NV	NV
Suspended Solid (SS)	mg/l	2540 D	< 2.5	5.4	[2/]
Ammonia Nitrogen	µg/l	4500-NH_3 F	< 10.0	ND	-
Dissolved Oxygen	mg/l	4500-O G	< 0.10	6.43	≥ 4
Salinity	ppt	2520 B	< 0.10	34.0	△≤ 10 %
Total Petroleum Hydrocarbon	µg/l	IOC/GGE(MSI)-III/3	< 0.10	ND	≤ 5.0
TOC*	mg/l	5310 B	< 0.01	1.64	-
Arsenic (As)	µg/l	3114 C	< 0.10	1.19	≤ 10
Nickel (Ni)	µg/l	3113 B	< 5.00	ND	-
Vanadium (V)	µg/l	3120 B	< 10.00	ND	-

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 24th ED.,2023 (AWWA,APHA, WEF)

REFERENCE : Intergovermental Occanographic Commission of UNESCO (IOC),1981

(Miss Pornnapa Budthum)
Analyst

(Miss Khemchuda Insorn)
Technical Management Team

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	**REQUEST SERVICE No.**	: 0500/69
SAMPLING BY	: SECOT Co., Ltd.	**REGISTRATION No.**	: -
SAMPLING DATE	: 23/03/2026	**SAMPLING METHOD**	: Integrate
RECEIVED DATE	: 24/03/2026	**SAMPLING TIME**	: 11:46
ANALYTICAL DATE	: 24/03/2026-09/04/2026	**SITE OPERATOR**	: Mr. Baworn Deechaiya
REPORT DATE	: 09/04/2026		:
SAMPLE CONDITION	: ใส	**FILE CODE**	: 226003_CW_March

PARAMETER	UNITS	ANALYSIS METHODS	ND (non-detectable)	SATATION 500 เมตรด้านทิศเหนือ ของ SPM (ที่ระดับ 1 เมตร)	STANDARD[1/]
Depth	m.	Measurement	-	24.8	-
Temperature	^{o}C	2550 B	< 0.5	29.7	△≤ 2
Transparency	m.	Secchi Disc	-	3.5	△≤ 10 %
pH	-	4500-H^{+} B	< 0.10	8.20	7.0-8.5
Fat Oil & Grease	mg/l	5520 B	< 2.0	ND	-
Fat Oil & Grease	-	Visual Testing	-	NV	NV
Suspended Solid (SS)	mg/l	2540 D	< 2.5	5.1	[2/]
Ammonia Nitrogen	µg/l	4500-NH_3 F	< 10.0	ND	-
Dissolved Oxygen	mg/l	4500-O G	< 0.10	4.30	≥ 4
Salinity	ppt	2520 B	< 0.10	26.7	△≤ 10 %
Total Petroleum Hydrocarbon	µg/l	IOC/GGE(MSI)-III/3	< 0.10	ND	≤ 5
TOC*	mg/l	5310 B	< 0.01	1.36	-
Arsenic (As)	µg/l	3114 C	< 0.10	ND	≤ 10
Nickel (Ni)	µg/l	3113 B	< 5.00	ND	-
Vanadium (V)	µg/l	3120 B	< 10.00	ND	-

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 24th ED.,2023 (AWWA,APHA, WEF)

REFERENCE : Intergovermental Occanographic Commission of UNESCO (IOC),1981

(Miss Pornnapa Budthum)
Analyst

(Miss Khemchuda Insorn)
Technical Management Team

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	**REQUEST SERVICE No**	: 0500/69
SAMPLING BY	: SECOT Co., Ltd.	**REGISTRATION No.**	: -
SAMPLING DATE	: 23/03/2026	**SAMPLING METHOD**	: Integrate
RECEIVED DATE	: 24/03/2026	**SAMPLING TIME**	: 11:28
ANALYTICAL DATE	: 24/03/2026-09/04/2026	**SITE OPERATOR**	: Mr. Baworn Deechaiya
REPORT DATE	: 09/04/2026		: -
SAMPLE CONDITION	: ใส	**FILE CODE**	: 226003_CW_March

PARAMETER	UNITS	ANALYSIS METHODS	ND (non-detectable)	SATATION 500 เมตรด้านทิศใต้ ของ SPM (ที่ระดับ 1 เมตร)	STANDARD[1/]
Depth	m.	Measurement	-	26.8	-
Temperature	^{o}C	2550 B	< 0.5	29.9	△≤ 2
Transparency	m.	Secchi Disc	< 0.10	4.0	△≤ 10 %
pH	-	4500-H^{+} B	-	8.18	7.0-8.5
Fat Oil & Grease	mg/l	5520 B	< 2.0	ND	-
Fat Oil & Grease	-	Visual Testing	-	NV	NV
Suspended Solid (SS)	mg/l	2540 D	< 2.5	< 2.5	[2/]
Ammonia Nitrogen	µg/l	4500-NH_3 F	< 10.0	ND	-
Dissolved Oxygen	mg/l	4500-O G	< 0.10	5.50	≥ 4
Salinity	ppt	2520 B	< 0.10	28.1	△≤ 10 %
Total Petroleum Hydrocarbon	µg/l	IOC/GGE(MSI)-III/3	< 0.10	ND	≤ 5
TOC*	mg/l	5310 B	< 0.01	1.48	-
Arsenic (As)	µg/l	3114 C	< 0.10	1.21	≤ 10
Nickel (Ni)	µg/l	3113 B	< 5.00	ND	-
Vanadium (V)	µg/l	3120 B	< 10.00	ND	-

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 24th ED.,2023 (AWWA,APHA, WEF)

REFERENCE : Intergovermental Occanographic Commission of UNESCO (IOC),1981

(Miss Pornnapa Budthum)
Analyst

(Miss Khemchuda Insorn)
Technical Management Team

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3. [1/] Notification of the National Environmental Board B.E.2564 (2021) (Class 5).

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[2/] The results should not be changed by more than the sum of daily average and the standard diviation.

Daily average was calculated from hourly measurement or at least 5 samples taken at equal time interval within one day.

4. *TOC analysis was performed by The Office of Public Health and Environmental Technology Services, Faculty of Public Health, Mahidol University.

5. - Not available .

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	**REQUEST SERVICE No**	: 0500/69
SAMPLING BY	: SECOT Co., Ltd.	**REGISTRATION No.**	: -
SAMPLING DATE	: 23/03/2026	**SAMPLING METHOD**	: Integrate
RECEIVED DATE	: 24/03/2026	**SAMPLING TIME**	: 11:40
ANALYTICAL DATE	: 24/03/2026-09/04/2026	**SITE OPERATOR**	: Mr. Baworn Deechaiya
REPORT DATE	: 09/04/2026		: -
SAMPLE CONDITION	: ใส	**FILE CODE**	: 226003_CW_March

PARAMETER	UNITS	ANALYSIS METHODS	ND (non-detectable)	SATATION 500 เมตรด้านทิศตะวันออก ของ SPM (ที่ระดับ 1 เมตร)	STANDARD[1/]
Depth	m.	Measurement	-	25.8	-
Temperature	°C	2550 B	< 0.5	29.8	△≤ 1
Transparency	m.	Secchi Disc	-	3.5	△≤ 10 %
pH	-	4500-H^+ B	< 0.10	8.19	7.0-8.5
Fat Oil & Grease	mg/l	5520 B	< 2.0	ND	-
Fat Oil & Grease	-	Visual Testing	-	NV	NV
Suspended Solid (SS)	mg/l	2540 D	< 2.5	4.9	[2/]
Ammonia Nitrogen	µg/l	4500-NH_3 F	< 10.0	ND	-
Dissolved Oxygen	mg/l	4500-O G	< 0.10	5.60	≥ 4
Salinity	ppt	2520 B	< 0.10	30.1	△≤ 10 %
Total Petroleum Hydrocarbon	µg/l	IOC/GGE(MSI)-III/3	< 0.10	ND	≤ 0.5
TOC*	mg/l	5310 B	< 0.01	1.52	-
Arsenic (As)	µg/l	3114 C	< 0.10	1.20	≤ 10
Nickel (Ni)	µg/l	3113 B	< 5.00	ND	-
Vanadium (V)	µg/l	3120 B	< 10.00	ND	-

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 24th ED.,2023 (AWWA,APHA, WEF)

REFERENCE : Intergovermental Occanographic Commission of UNESCO (IOC),1981

(Miss Pornnapa Budthum)
Analyst

(Miss Khemchuda Insorn)
Technical Management Team

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4. *TOC analysis was performed by The Office of Public Health and Environmental Technology Services, Faculty of Public Health, Mahidol University.

5. - Not available .

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	**REQUEST SERVICE No**	: 0500/69
SAMPLING BY	: SECOT Co., Ltd.	**REGISTRATION No.**	: -
SAMPLING DATE	: 23/03/2026	**SAMPLING METHOD**	: Integrate
RECEIVED DATE	: 24/03/2026	**SAMPLING TIME**	: 11:16
ANALYTICAL DATE	: 24/03/2026-09/04/2026	**SITE OPERATOR**	: Mr. Baworn Deechaiya
REPORT DATE	: 09/04/2026		: -
SAMPLE CONDITION	: ใส	**FILE CODE**	: 226003_CW_March

PARAMETER	UNITS	ANALYSIS METHODS	ND (non-detectable)	SATATION 500 เมตรด้านทิศตะวันตก ของ SPM (ที่ระดับ 1 เมตร)	STANDARD[1/]
Depth	m.	Measurement	-	20.6	-
Temperature	^{o}C	2550 B	< 0.5	29.7	△≤ 2
Transparency	m.	Secchi Disc	-	4.0	△≤ 10 %
pH	-	4500-H^{+} B	< 0.10	8.19	7.0-8.5
Fat Oil & Grease	mg/l	5520 B	< 2.0	ND	-
Fat Oil & Grease	-	Visual Testing	-	NV	NV
Suspended Solid (SS)	mg/l	2540 D	< 2.5	2.8	[2/]
Ammonia Nitrogen	µg/l	4500-NH_3 F	< 10.0	ND	-
Dissolved Oxygen	mg/l	4500-O G	< 0.10	5.60	≥ 4
Salinity	ppt	2520 B	< 0.10	23.9	△≤ 10 %
Total Petroleum Hydrocarbon	µg/l	IOC/GGE(MSI)-III/3	< 0.10	ND	≤ 5.0
TOC*	mg/l	5310 B	< 0.01	1.31	-
Arsenic (As)	µg/l	3114 C	< 0.10	4.43	≤ 10
Nickel (Ni)	µg/l	3113 B	< 5.00	ND	-
Vanadium (V)	µg/l	3120 B	< 10.00	ND	-

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 24th ED.,2023 (AWWA,APHA, WEF)

REFERENCE : Intergovermental Occanographic Commission of UNESCO (IOC),1981

(Miss Pornnapa Budthum)
Analyst

(Miss Khemchuda Insorn)
Technical Management Team

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5. - Not available .

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	**REQUEST SERVICE No.**	: 0850/69
SAMPLING BY	: SECOT Co., Ltd.	**REGISTRATION No.**	: -
SAMPLING DATE	: 16/05/2026	**SAMPLING METHOD**	: Integrate
RECEIVED DATE	: 17/05/2026	**SAMPLING TIME**	: 10:35
ANALYTICAL DATE	: 17-27/05/2026	**SITE OPERATOR**	: Mr.Chanapon Oakkharaplon
REPORT DATE	: 29/05/2026		: -
SAMPLE CONDITION	: ใส	**FILE CODE**	: 226003_CW_May

PARAMETER	UNITS	ANALYSIS METHODS	ND (non-detectable)	SATATION 500 กม. ด้านทิศเหนือ ของ SPM (ที่ระดับ 1 เมตร)	STANDARD 1/
Depth	m.	Measurement	-	25.8	-
Temperature	^{o}C	2550 B	< 0.5	31.5	△≤ 2
Transparency	m.	Secchi Disc	-	7.5	△≤ 10 %
pH	-	4500-H^{+} B	< 0.10	7.99	7.0-8.5
Fat Oil & Grease	mg/l	5520 B	< 2.0	ND	-
Fat Oil & Grease	-	Visual Testing	-	NV	NV
Suspended Solid (SS)	mg/l	2540 D	< 2.5	3.2	2/
Ammonia Nitrogen	µg/l	4500-NH_3 F	< 10.0	ND	-
Dissolved Oxygen	mg/l	4500-O G	< 0.10	5.90	≥ 4
Salinity	ppt	2520 B	< 0.10	29.4	△≤ 10 %
Total Petroleum Hydrocarbon	µg/l	IOC/GGE(MSI)-III/3	< 0.10	ND	≤ 5
TOC*	mg/l	5310 B	< 0.01	1.28	-
Arsenic (As)	µg/l	3114 C	< 0.10	0.99	≤ 10
Nickel (Ni)	µg/l	3113 B	< 5.00	ND	-
Vanadium (V)	µg/l	3120 B	< 10.00	ND	-

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 24th ED.,2023 (AWWA,APHA, WEF)

REFERENCE : Intergovermental Occanographic Commission of UNESCO (IOC),1981

(Miss Pornnapa Budthum)
Analyst

(Miss Khemchuda Insorn)
Technical Management Team

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5. - Not available .

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	**REQUEST SERVICE No**	: 0850/69
SAMPLING BY	: SECOT Co., Ltd.	**REGISTRATION No.**	: -
SAMPLING DATE	: 16/05/2026	**SAMPLING METHOD**	: Integrate
RECEIVED DATE	: 17/05/2026	**SAMPLING TIME**	: 10:10
ANALYTICAL DATE	: 17-27/05/2026	**SITE OPERATOR**	: Mr.Chanapon Oakkharaplon
REPORT DATE	: 29/05/2026		: -
SAMPLE CONDITION	: ใส	**FILE CODE**	: 226003_CW_May

PARAMETER	UNITS	ANALYSIS METHODS	ND (non-detectable)	SATATION 500 กม. ด้านทิศใต้ ของ SPM (ที่ระดับ 1 เมตร)	STANDARD 1/
Depth	m.	Measurement	-	25.5	-
Temperature	^{o}C	2550 B	< 0.5	31.5	△≤ 2
Transparency	m.	Secchi Disc	< 0.10	7.5	△≤ 10 %
pH	-	4500-H^{+} B	-	7.74	7.0-8.5
Fat Oil & Grease	mg/l	5520 B	< 2.0	ND	-
Fat Oil & Grease	-	Visual Testing	-	NV	NV
Suspended Solid (SS)	mg/l	2540 D	< 2.5	< 2.5	2/
Ammonia Nitrogen	µg/l	4500-NH_3 F	< 10.0	ND	-
Dissolved Oxygen	mg/l	4500-O G	< 0.10	6.20	≥ 4
Salinity	ppt	2520 B	< 0.10	29.2	△≤ 10 %
Total Petroleum Hydrocarbon	µg/l	IOC/GGE(MSI)-III/3	< 0.10	ND	≤ 5
TOC*	mg/l	5310 B	< 0.01	1.55	-
Arsenic (As)	µg/l	3114 C	< 0.10	1.00	≤ 10
Nickel (Ni)	µg/l	3113 B	< 5.00	ND	-
Vanadium (V)	µg/l	3120 B	< 10.00	ND	-

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 24th ED.,2023 (AWWA,APHA, WEF)

REFERENCE : Intergovermental Occanographic Commission of UNESCO (IOC),1981

(Miss Pornnapa Budthum)
Analyst

(Miss Khemchuda Insorn)
Technical Management Team

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5. - Not available .

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	**REQUEST SERVICE No**	: 0850/69
SAMPLING BY	: SECOT Co., Ltd.	**REGISTRATION No.**	: -
SAMPLING DATE	: 16/05/2026	**SAMPLING METHOD**	: Integrate
RECEIVED DATE	: 17/05/2026	**SAMPLING TIME**	: 10:00
ANALYTICAL DATE	: 17-27/05/2026	**SITE OPERATOR**	: Mr.Chanapon Oakkharaplon
REPORT DATE	: 29/05/2026		: -
SAMPLE CONDITION	: ใส	**FILE CODE**	: 226003_CW_May

PARAMETER	UNITS	ANALYSIS METHODS	ND (non-detectable)	SATATION 500 กม. ด้านทิศตะวันออก ของ SPM (ที่ระดับ 1 เมตร)	STANDARD[1/]
Depth	m.	Measurement	-	24.5	-
Temperature	^{o}C	2550 B	< 0.5	31.5	△≤ 1
Transparency	m.	Secchi Disc	-	7.5	△≤ 10 %
pH	-	4500-H^{+} B	< 0.10	7.11	7.0-8.5
Fat Oil & Grease	mg/l	5520 B	< 2.0	ND	-
Fat Oil & Grease	-	Visual Testing	-	NV	NV
Suspended Solid (SS)	mg/l	2540 D	< 2.5	2.7	[2/]
Ammonia Nitrogen	µg/l	4500-NH_3 F	< 10.0	10.0	-
Dissolved Oxygen	mg/l	4500-O G	< 0.10	5.85	≥ 4
Salinity	ppt	2520 B	< 0.10	29.1	△≤ 10 %
Total Petroleum Hydrocarbon	µg/l	IOC/GGE(MSI)-III/3	< 0.10	0.14	≤ 0.5
TOC*	mg/l	5310 B	< 0.01	1.42	-
Arsenic (As)	µg/l	3114 C	< 0.10	1.00	≤ 10
Nickel (Ni)	µg/l	3113 B	< 5.00	ND	-
Vanadium (V)	µg/l	3120 B	< 10.00	ND	-

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 24th ED.,2023 (AWWA,APHA, WEF)

REFERENCE : Intergovermental Occanographic Commission of UNESCO (IOC),1981

(Miss Pornnapa Budthum)
Analyst

(Miss Khemchuda Insorn)
Technical Management Team

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd	**REQUEST SERVICE No**	: 0850/69
SAMPLING BY	: SECOT Co., Ltd.	**REGISTRATION No.**	: -
SAMPLING DATE	: 16/05/2026	**SAMPLING METHOD**	: Integrate
RECEIVED DATE	: 17/05/2026	**SAMPLING TIME**	: 10:25
ANALYTICAL DATE	: 17-27/05/2026	**SITE OPERATOR**	: Mr.Chanapon Oakkharaplon
REPORT DATE	: 29/05/2026		: -
SAMPLE CONDITION	: ใส	**FILE CODE**	: 226003_CW_May

PARAMETER	UNITS	ANALYSIS METHODS	ND (non-detectable)	SATATION 500 กม. ด้านทิศตะวันตก ของ SPM (ที่ระดับ 1 เมตร)	STANDARD 1/
Depth	m.	Measurement	-	25.9	-
Temperature	^{o}C	2550 B	< 0.5	31.5	△≤ 2
Transparency	m.	Secchi Disc	-	7.5	△≤ 10 %
pH	-	4500-H^{+} B	< 0.10	7.93	7.0-8.5
Fat Oil & Grease	mg/l	5520 B	< 2.0	ND	-
Fat Oil & Grease	-	Visual Testing	-	NV	NV
Suspended Solid (SS)	mg/l	2540 D	< 2.5	2.7	2/
Ammonia Nitrogen	µg/l	4500-NH_3 F	< 10.0	29.3	-
Dissolved Oxygen	mg/l	4500-O G	< 0.10	6.10	≥ 4
Salinity	ppt	2520 B	< 0.10	29.4	△≤ 10 %
Total Petroleum Hydrocarbon	µg/l	IOC/GGE(MSI)-III/3	< 0.10	ND	≤ 5.0
TOC*	mg/l	5310 B	< 0.01	1.51	-
Arsenic (As)	µg/l	3114 C	< 0.10	1.14	≤ 10
Nickel (Ni)	µg/l	3113 B	< 5.00	ND	-
Vanadium (V)	µg/l	3120 B	< 10.00	ND	-

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 24th ED.,2023 (AWWA,APHA, WEF)

REFERENCE : Intergovermental Occanographic Commission of UNESCO (IOC),1981

(Miss Pornnapa Budthum)
Analyst

(Miss Khemchuda Insorn)
Technical Management Team

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WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	**REQUEST SERVICE No**	: 0770/69
SAMPLING BY	: SECOT Co., Ltd.	**REGISTRATION No.**	: -
SAMPLING DATE	: 08/05/2026	**SAMPLING METHOD**	: Integrate
RECEIVED DATE	: 09/05/2026	**SAMPLING TIME**	: 10:45
ANALYTICAL DATE	: 09-22/05/2026	**SITE OPERATOR**	: Mr. Chanapon Oakkharaplon
REPORT DATE	: 29/05/2026		: -
SAMPLE CONDITION	: เหลืองใสมีตะกอน	**FILE CODE**	: 226003_CW_May

PARAMETER	UNITS	ANALYSIS METHODS	ND (non-detectable)	SATATION Ko Saket	STANDARD 1/
Depth	m.	Measurement	-	2.5	-
Temperature	^{o}C	2550 B	< 0.5	32.0	△≤ 2
Transparency	m.	Secchi Disc	< 0.10	1.2	△≤ 10 %
pH	-	4500-H^{+} B	-	8.17	7.0-8.5
Fat Oil & Grease	mg/l	5520 B	< 2.0	ND	-
Fat Oil & Grease	-	Visual Testing	-	NV	NV
Suspended Solid (SS)	mg/l	2540 D	< 2.5	16.0	2/
Ammonia Nitrogen	µg/l	4500-NH_3 F	< 10.0	15.4	-
Phenols	mg/l	5530 B-C	< 0.001	ND	≤ 0.03
Dissolved Oxygen	mg/l	4500-O G	< 0.10	6.30	≥ 4
BOD_5	mg/l	5210 B	< 1.0	1.8	-
Salinity	ppt	2520 B	< 0.10	27.9	△≤ 10 %
Total Petroleum Hydrocarbon	µg/l	IOC/GGE(MSI)-III/3	< 0.10	ND	≤ 5
TOC*	mg/l	5310 B	< 0.01	1.18	-
Chromium Trivalent (Cr^{3+})	µg/l	3113 B / Calculation	< 1.00	ND	-
Chromium Hexavalent (Cr^{6+})	µg/l	3113 B	< 1.00	ND	≤ 50
Mercury (Hg)	µg/l	3112 B	< 0.05	ND	≤ 0.1

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 24th ED.,2023 (AWWA,APHA, WEF)

REFERENCE : Intergovermental Occanographic Commission of UNESCO (IOC),1981

(Miss Pornnapa Budthum)
Analyst

(Miss Khemchuda Insorn)
Technical Management Team

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

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3. 1/ Notification of the National Environmental Board B.E. 2564 (2021) (Class 5).

△ : Change from natural condition, ≤ : Not more than, NV : Not visible, ≥ : Not less than.

2/ The results should not be changed by more than the sum of daily average and the standard diviation.

Daily average was calculated from hourly measurement or at least 5 samples taken at equal time interval within one day.

4. *TOC analysis was performed by The Office of Public Health and Environmental Technology Services, Faculty of Public Health, Mahidol University.

5. - Not available .

บริษัท ซีคอท จำกัด
SECOT CO., LTD.
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TEL. (662) 959-3600 FAX (662) 959-3535 Website : secot.co.th E-mail : envserv@secot.co.th

WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	**REQUEST SERVICE No**	: 0770/69
SAMPLING BY	: SECOT Co., Ltd.	**REGISTRATION No.**	: -
SAMPLING DATE	: 08/05/2026	**SAMPLING METHOD**	: Integrate
RECEIVED DATE	: 09/05/2026	**SAMPLING TIME**	: 10:20
ANALYTICAL DATE	: 09-22/05/2026	**SITE OPERATOR**	: Mr. Chanapon Oakkharaplon
REPORT DATE	: 29/05/2026		: -
SAMPLE CONDITION	: ใสมีตะกอน	**FILE CODE**	: 226003_CW_May

PARAMETER	UNITS	ANALYSIS METHODS	ND (non-detectable)	SATATION Had Sai Thong Beach	STANDARD[1/]
Depth	m.	Measurement	-	2.7	-
Temperature	^{o}C	2550 B	< 0.5	32.6	△≤ 1
Transparency	m.	Secchi Disc	-	1.0	△≤ 10 %
pH	-	4500-H^{+} B	< 0.10	7.94	7.0-8.5
Fat Oil & Grease	mg/l	5520 B	< 2.0	ND	-
Fat Oil & Grease	-	Visual Testing	-	NV	NV
Suspended Solid (SS)	mg/l	2540 D	< 2.5	24.0	[2/]
Ammonia Nitrogen	µg/l	4500-NH_3 F	< 10.0	48.6	-
Phenols	mg/l	5530 B-C	< 0.001	ND	≤ 0.03
Dissolved Oxygen	mg/l	4500-O G	< 0.10	4.90	≥ 4
BOD_5	mg/l	5210 B	< 1.0	1.7	-
Salinity	ppt	2520 B	< 0.10	28.8	△≤ 10 %
Total Petroleum Hydrocarbon	µg/l	IOC/GGE(MSI)-III/3	< 0.10	0.44	≤ 5
TOC*	mg/l	5310 B	< 0.01	1.24	-
Chromium Trivalent (Cr^{3+})	µg/l	3113 B / Calculation	< 1.00	ND	-
Chromium Hexavalent (Cr^{6+})	µg/l	3113 B	< 1.00	ND	≤ 50
Mercury (Hg)	µg/l	3112 B	< 0.05	ND	≤ 0.1

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 24th ED.,2023 (AWWA,APHA, WEF)

REFERENCE : Intergovermental Occanographic Commission of UNESCO (IOC),1981

(Miss Pornnapa Budthum)
Analyst

(Miss Khemchuda Insorn)
Technical Management Team

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

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△ : Change from natural condition , ≤ : Not more than, NV : Not visible, ≥ : Not less than.

[2/] The results should not be changed by more than the sum of daily average and the standard diviation.

Daily average was calculated from hourly measurement or at least 5 samples taken at equal time interval within one day.

4. *TOC analysis was performed by The Office of Public Health and Environmental Technology Services, Faculty of Public Health, Mahidol University.

5. - Not available .

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

WATER AND WASTEWATER ANALYSIS REPORT

CLIENT NAME	: Star Petroleum Refining Public Co., Ltd.	**REQUEST SERVICE No**	: 0770/69
SAMPLING BY	: SECOT Co., Ltd.	**REGISTRATION No.**	: -
SAMPLING DATE	: 08/05/2026	**SAMPLING METHOD**	: Integrate
RECEIVED DATE	: 09/05/2026	**SAMPLING TIME**	: 10:55
ANALYTICAL DATE	: 09-22/05/2026	**SITE OPERATOR**	: Mr. Chanapon Oakkharaplon
REPORT DATE	: 29/05/2026		: -
SAMPLE CONDITION	: ใสมีตะกอน	**FILE CODE**	: 226003_CW_May

PARAMETER	UNITS	ANALYSIS METHODS	ND (non-detectable)	SATATION Open Coastal Water	STANDARD[1/]
Depth	m.	Measurement	-	4.5	-
Temperature	^{o}C	2550 B	< 0.5	32.1	△≤ 2
Transparency	m.	Secchi Disc	-	1.7	△≤ 10 %
pH	-	4500-H^{+} B	< 0.10	8.17	7.0-8.5
Fat Oil & Grease	mg/l	5520 B	< 2.0	ND	-
Fat Oil & Grease	-	Visual Testing	-	NV	NV
Suspended Solid (SS)	mg/l	2540 D	< 2.5	9.2	[2/]
Ammonia Nitrogen	µg/l	4500-NH_3 F	< 10.0	88.7	-
Phenols	mg/l	5530 B-C	< 0.001	ND	≤ 0.03
Dissolved Oxygen	mg/l	4500-O G	< 0.10	5.30	≥ 4
BOD_5	mg/l	5210 B	< 1.0	1.4	-
Salinity	ppt	2520 B	< 0.10	28.0	△≤ 10 %
Total Petroleum Hydrocarbon	µg/l	IOC/GGE(MSI)-III/3	< 0.10	ND	≤ 5.0
TOC*	mg/l	5310 B	< 0.01	1.16	-
Chromium Trivalent (Cr^{3+})	µg/l	3113 B / Calculation	< 1.00	ND	-
Chromium Hexavalent (Cr^{6+})	µg/l	3113 B	< 1.00	ND	≤ 50
Mercury (Hg)	µg/l	3112 B	< 0.05	ND	≤ 0.1

REFERENCE : STANDARD METHODS FOR EXAMINATION OF WATER AND WASTEWATER 24th ED.,2023 (AWWA,APHA, WEF)

REFERENCE : Intergovermental Occanographic Commission of UNESCO (IOC),1981

(Miss Pornnapa Budthum)
Analyst

(Miss Khemchuda Insorn)
Technical Management Team

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

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[2/] The results should not be changed by more than the sum of daily average and the standard diviation.

Daily average was calculated from hourly measurement or at least 5 samples taken at equal time interval within one day.

4. *TOC analysis was performed by The Office of Public Health and Environmental Technology Services, Faculty of Public Health, Mahidol University.

5. - Not available .

ใบรับรองผลการตรวจวัดระดับเสียง

Noise Monitoring Result : Community Noise
MTR-SPRC PLC-Marine

Location : In front of Marine Control Office
Monitor Period : 17-22 Mar 2026
SLM Model : Cirrus CR161B
Serial No : G303827
Site Operator : Mr. Song Hengchwankun

Calibrator Model : Cirrus CR:515
Serial No : 97097
Calibration Ref dB(A) : 94.0
Certified Date : 14 Oct 2025
SLM Reading / Adjust dB(A) : 93.7/0.0
Expire Date : 13 Oct 2026
Cal Sheet No.: CR-515-2026-064

Time	Equivalent Sound Pressure Level (dB(A))				
	17-18 Mar 2026	18-19 Mar 2026	19-20 Mar 2026	20-21 Mar 2026	21-22 Mar 2026
10:00 - 11:00	59.2	65.0	56.3	55.3	55.5
11:00 - 12:00	58.1	60.4	59.4	54.5	54.8
12:00 - 13:00	59.2	59.5	57.7	55.5	54.7
13:00 - 14:00	59.1	66.4	55.6	54.9	55.6
14:00 - 15:00	59.8	59.0	56.4	53.6	55.5
15:00 - 16:00	61.0	59.6	57.1	54.2	55.6
16:00 - 17:00	61.7	59.5	57.0	56.4	53.5
17:00 - 18:00	61.9	59.2	55.7	54.2	54.5
18:00 - 19:00	61.7	57.0	55.5	54.1	55.1
19:00 - 20:00	61.3	54.8	56.1	54.2	53.6
20:00 - 21:00	61.5	54.9	57.5	53.5	56.0
21:00 - 22:00	61.7	54.3	53.5	53.4	53.5
22:00 - 23:00	61.6	54.4	52.6	53.3	53.2
23:00 - 00:00	61.1	55.1	53.7	53.3	54.5
00:00 - 01:00	61.2	56.3	53.5	54.1	55.0
01:00 - 02:00	61.9	55.3	54.7	53.3	55.1
02:00 - 03:00	61.8	56.0	55.1	53.4	54.3
03:00 - 04:00	61.8	54.8	54.6	53.3	55.3
04:00 - 05:00	62.2	54.8	55.2	53.8	55.0
05:00 - 06:00	62.5	55.3	56.2	54.0	55.0
06:00 - 07:00	61.5	55.8	56.6	54.0	55.6
07:00 - 08:00	65.2	65.1	65.3	54.2	60.1
08:00 - 09:00	64.1	55.8	55.9	54.1	55.8
09:00 - 10:00	60.3	56.0	55.0	53.6	55.7
Leq(24)*	61.6	59.5	57.2	54.2	55.3
Ldn	68.1	63.1	61.9	60.2	61.4
Lmax **	91.2	90.7	92.7	81.8	84.3
Standard-24Hr	70 dB(A)				
Standard-Max	115 dB(A)				

Remark : * Average time between 10:00-10:00
** Maximum Sound Pressure Level between 10:00-10:00

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

Preeda S.
(Miss Preeda Somjai)
Technical Management Team

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Tel:+66(0)2959-3600 Fax:+66(0)2959-3535

Noise Monitoring Result : Background Noise
MTR-SPRC PLC-Marine

Location : In front of Marine Control Office
Monitor Period : 17-22 Mar 2026
SLM Model : Cirrus CR161B
Serial No : G303827
Site Operator : Mr. Song Hengchwankun

Calibrator Model : Cirrus CR:515
Serial No : 97097
Calibration Ref dB(A) : 94.0
Certified Date : 14 Oct 2025
SLM Reading / Adjust dB(A) : 93.7/0.0
Expire Date : 13 Oct 2026
Cal Sheet No.: CR-515-2026-064

Time	L90 (dB(A))				
	17-18 Mar 2026	18-19 Mar 2026	19-20 Mar 2026	20-21 Mar 2026	21-22 Mar 2026
10:00 - 11:00	57.7	59.3	54.9	52.6	52.0
11:00 - 12:00	56.8	59.4	55.0	52.1	52.5
12:00 - 13:00	58.0	58.7	53.2	51.6	51.8
13:00 - 14:00	57.4	58.4	53.1	52.2	53.7
14:00 - 15:00	58.9	58.2	55.1	52.0	52.9
15:00 - 16:00	59.9	58.7	55.4	52.4	54.0
16:00 - 17:00	60.3	58.6	55.4	52.2	50.6
17:00 - 18:00	60.0	57.9	53.7	51.8	52.5
18:00 - 19:00	60.1	53.5	54.0	52.2	52.8
19:00 - 20:00	60.0	53.4	54.4	51.8	52.5
20:00 - 21:00	60.0	53.5	55.5	50.8	53.4
21:00 - 22:00	60.1	52.8	50.8	50.9	52.4
22:00 - 23:00	60.4	52.9	50.2	50.7	52.4
23:00 - 00:00	60.0	53.4	52.6	50.8	52.8
00:00 - 01:00	59.9	55.0	52.7	51.5	53.2
01:00 - 02:00	60.1	54.1	52.8	51.6	53.9
02:00 - 03:00	60.2	54.4	52.3	51.8	53.3
03:00 - 04:00	60.5	53.2	52.8	51.4	53.1
04:00 - 05:00	60.5	53.4	52.8	51.2	53.7
05:00 - 06:00	61.0	53.7	53.9	51.9	53.7
06:00 - 07:00	59.8	54.1	52.8	52.2	53.2
07:00 - 08:00	59.9	53.8	52.6	52.3	54.1
08:00 - 09:00	60.0	53.4	53.0	51.6	54.6
09:00 - 10:00	58.7	54.3	52.4	51.6	53.5
L90(avg)*	59.7	56.0	53.6	51.7	53.1

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

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

Preeda S.

(Miss Preeda Somjai)
Technical Management Team

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Tel:+66(0)2959-3600 Fax:+66(0)2959-3535

Noise Monitoring Result : Community Noise
MTR-SPRC PLC-Marine

Location : Between middle of Asphalt Tank and pipes rack
Monitor Period : 17-22 Mar 2026
SLM Model : Cirrus CR161B
Serial No : G303830
Site Operator : Mr. Song Hengchwankun

Calibrator Model : Cirrus CR:515
Serial No : 97097
Calibration Ref dB(A) : 94.0
Certified Date : 14 Oct 2025
SLM Reading / Adjust dB(A) : 93.7/0.0
Expire Date : 13 Oct 2026
Cal Sheet No.: CR-515-2026-064

Time	Equivalent Sound Pressure Level (dB(A))				
	17-18 Mar 2026	18-19 Mar 2026	19-20 Mar 2026	20-21 Mar 2026	21-22 Mar 2026
10:00 - 11:00	57.5	62.3	62.8	56.4	56.6
11:00 - 12:00	58.5	58.4	61.4	57.8	58.2
12:00 - 13:00	58.0	57.1	56.0	56.8	56.4
13:00 - 14:00	58.7	64.8	56.0	56.7	56.7
14:00 - 15:00	57.4	60.9	54.1	55.5	56.8
15:00 - 16:00	58.2	57.7	60.1	56.2	56.7
16:00 - 17:00	58.2	57.8	56.6	57.0	57.9
17:00 - 18:00	60.6	60.7	59.1	59.4	59.0
18:00 - 19:00	59.6	59.2	57.9	57.9	58.8
19:00 - 20:00	57.5	56.8	56.6	55.9	58.0
20:00 - 21:00	58.1	56.4	55.5	55.2	62.3
21:00 - 22:00	57.7	55.6	55.9	54.7	60.0
22:00 - 23:00	57.5	55.0	54.9	54.6	55.5
23:00 - 00:00	56.9	54.9	54.8	54.8	55.1
00:00 - 01:00	56.8	56.1	54.3	54.3	55.1
01:00 - 02:00	57.8	55.6	54.9	54.5	55.7
02:00 - 03:00	58.2	55.4	54.8	54.3	55.6
03:00 - 04:00	57.9	55.6	54.9	54.7	54.8
04:00 - 05:00	57.5	56.4	54.5	54.2	55.1
05:00 - 06:00	59.8	57.1	56.9	55.0	54.9
06:00 - 07:00	60.8	59.3	57.8	58.6	57.6
07:00 - 08:00	66.9	66.0	65.5	61.2	61.4
08:00 - 09:00	65.5	59.4	58.8	57.3	56.8
09:00 - 10:00	58.2	56.8	56.2	56.0	55.5
Leq(24)*	59.9	59.4	58.3	56.6	57.6
Ldn	65.2	63.7	62.7	62.0	62.5
Lmax **	91.0	90.6	90.2	88.5	87.4
Standard-24Hr	70 dB(A)				
Standard-Max	115 dB(A)				

Remark : * Average time between 10:00-10:00
** Maximum Sound Pressure Level between 10:00-10:00

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

Preeda S.
(Miss Preeda Somjai)
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Noise Monitoring Result : Background Noise
MTR-SPRC PLC-Marine

Location : Between middle of Asphalt Tank and pipes rack
Monitor Period : 17-22 Mar 2026
SLM Model : Cirrus CR161B
Serial No : G303830
Site Operator : Mr. Song Hengchwankun

Calibrator Model : Cirrus CR:515
Serial No : 97097
Calibration Ref dB(A) : 94.0
Certified Date : 14 Oct 2025
SLM Reading / Adjust dB(A) : 93.7/0.0
Expire Date : 13 Oct 2026
Cal Sheet No.: CR-515-2026-064

Time	L90 (dB(A))				
	17-18 Mar 2026	18-19 Mar 2026	19-20 Mar 2026	20-21 Mar 2026	21-22 Mar 2026
10:00 - 11:00	55.4	55.8	54.9	53.7	53.4
11:00 - 12:00	55.0	54.9	55.6	53.6	53.8
12:00 - 13:00	55.2	54.1	51.9	52.8	52.9
13:00 - 14:00	56.5	54.6	51.5	52.7	53.1
14:00 - 15:00	55.0	54.2	51.4	52.9	54.3
15:00 - 16:00	55.8	55.4	52.2	53.4	54.8
16:00 - 17:00	55.6	54.6	52.3	52.7	55.5
17:00 - 18:00	55.6	54.4	52.7	52.7	54.4
18:00 - 19:00	55.2	53.5	52.8	52.7	54.5
19:00 - 20:00	55.1	53.9	53.1	52.7	55.3
20:00 - 21:00	55.9	54.0	52.8	52.4	56.1
21:00 - 22:00	56.1	54.1	53.8	52.7	54.8
22:00 - 23:00	56.1	53.6	53.4	52.6	54.4
23:00 - 00:00	56.0	53.2	53.1	53.4	53.9
00:00 - 01:00	56.0	55.1	52.9	53.4	54.3
01:00 - 02:00	56.5	54.6	53.7	53.3	54.4
02:00 - 03:00	57.4	54.6	53.7	53.3	54.3
03:00 - 04:00	57.2	54.4	53.7	53.3	53.8
04:00 - 05:00	56.5	55.4	53.0	53.0	53.9
05:00 - 06:00	57.5	55.4	53.2	53.3	53.7
06:00 - 07:00	58.6	55.7	53.2	53.5	53.8
07:00 - 08:00	58.3	56.3	54.4	54.4	54.7
08:00 - 09:00	56.9	55.5	53.2	52.6	54.6
09:00 - 10:00	55.7	54.1	53.3	52.4	53.5
L90(avg)*	56.3	54.7	53.3	53.1	54.3

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

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

Preeda S.
(Miss Preeda Somjai)
Technical Management Team

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Bangsue, Bangkok 10800
Tel:+66(0)2959-3600 Fax:+66(0)2959-3535

Noise Monitoring Result : Community Noise
MTR-SPRC PLC-Marine

Location : Wat Takuan Kongka Ram
Monitor Period : 17-22 Mar 2026
SLM Model : Cirrus CR161B
Serial No : G303833
Site Operator : Mr. Song Hengchwankun

Calibrator Model : Cirrus CR:515
Serial No : 97097
Calibration Ref dB(A) : 94.0
Certified Date : 14 Oct 2025
SLM Reading / Adjust dB(A) : 93.7/0.0
Expire Date : 13 Oct 2026
Cal Sheet No.: CR-515-2026-064

Time	Equivalent Sound Pressure Level (dB(A))				
	17-18 Mar 2026	18-19 Mar 2026	19-20 Mar 2026	20-21 Mar 2026	21-22 Mar 2026
11:00 - 12:00	62.9	72.1	70.7	72.3	71.6
12:00 - 13:00	55.8	59.8	52.8	73.2	63.9
13:00 - 14:00	51.4	54.4	48.6	51.6	51.0
14:00 - 15:00	52.6	62.4	50.6	52.5	53.0
15:00 - 16:00	52.1	60.9	52.4	57.9	54.5
16:00 - 17:00	58.2	61.8	49.7	70.3	67.5
17:00 - 18:00	49.7	47.7	73.4	59.5	47.0
18:00 - 19:00	73.8	71.0	73.4	71.1	71.0
19:00 - 20:00	46.9	54.2	55.8	58.8	57.6
20:00 - 21:00	65.7	66.9	67.8	59.8	59.3
21:00 - 22:00	56.2	46.9	67.9	63.0	60.7
22:00 - 23:00	69.4	68.0	61.9	51.0	52.4
23:00 - 00:00	58.9	70.4	72.5	62.3	62.3
00:00 - 01:00	69.9	73.1	64.7	64.4	63.5
01:00 - 02:00	69.9	55.2	42.9	62.8	58.9
02:00 - 03:00	45.5	68.9	73.8	63.7	64.5
03:00 - 04:00	45.5	72.7	45.1	59.3	64.4
04:00 - 05:00	47.5	46.1	46.2	45.0	52.9
05:00 - 06:00	48.0	45.5	49.0	45.7	52.4
06:00 - 07:00	70.0	71.6	70.1	73.3	73.7
07:00 - 08:00	56.3	53.0	55.1	49.8	48.5
08:00 - 09:00	54.7	51.3	54.2	54.4	50.7
09:00 - 10:00	51.6	54.7	53.2	53.8	48.1
10:00 - 11:00	73.7	73.6	70.4	52.5	49.3
Leq(24)*	66.0	67.7	67.6	66.2	64.8
Ldn	72.7	75.5	74.3	72.0	72.0
Lmax **	88.3	85.5	86.2	86.4	87.4
Standard-24Hr	70 dB(A)				
Standard-Max	115 dB(A)				

Remark : * Average time between 11:00-11:00
** Maximum Sound Pressure Level between 11:00-11:00

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

Preeda S.
(Miss Preeda Somjai)
Technical Management Team

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Noise Monitoring Result : Background Noise
MTR-SPRC PLC-Marine

Location : Wat Takuan Kongka Ram
Monitor Period : 17-22 Mar 2026
SLM Model : Cirrus CR161B
Serial No : G303833
Site Operator : Mr. Song Hengchwankun

Calibrator Model : Cirrus CR:515
Serial No : 97097
Calibration Ref dB(A) : 94.0
Certified Date : 14 Oct 2025
SLM Reading / Adjust dB(A) : 93.7/0.0
Expire Date : 13 Oct 2026
Cal Sheet No.: CR-515-2026-064

Time	L90 (dB(A))				
	17-18 Mar 2026	18-19 Mar 2026	19-20 Mar 2026	20-21 Mar 2026	21-22 Mar 2026
11:00 - 12:00	50.2	59.9	47.1	53.8	46.8
12:00 - 13:00	46.2	47.2	45.6	46.0	45.2
13:00 - 14:00	44.7	45.3	43.9	44.6	45.1
14:00 - 15:00	46.4	45.0	45.4	45.2	46.8
15:00 - 16:00	44.1	46.5	47.1	44.9	46.8
16:00 - 17:00	42.2	46.4	45.9	56.0	56.9
17:00 - 18:00	41.6	42.1	50.8	42.3	40.9
18:00 - 19:00	41.1	42.5	41.2	41.1	40.4
19:00 - 20:00	39.5	42.1	39.1	40.2	47.5
20:00 - 21:00	39.5	39.3	40.7	40.9	41.4
21:00 - 22:00	40.1	36.1	38.9	49.2	41.7
22:00 - 23:00	40.7	38.4	38.9	38.6	40.5
23:00 - 00:00	39.6	38.4	51.5	48.8	41.0
00:00 - 01:00	38.3	57.3	48.4	49.2	54.3
01:00 - 02:00	38.0	38.2	37.5	43.9	40.2
02:00 - 03:00	38.3	40.3	38.1	40.4	41.8
03:00 - 04:00	39.3	46.3	39.9	47.6	47.4
04:00 - 05:00	40.9	38.0	39.9	38.7	42.9
05:00 - 06:00	42.1	39.4	38.1	39.4	40.8
06:00 - 07:00	43.9	43.3	42.8	41.5	41.9
07:00 - 08:00	51.3	45.9	45.9	41.1	41.6
08:00 - 09:00	46.3	43.3	45.0	41.4	42.9
09:00 - 10:00	44.9	43.4	45.3	43.2	43.2
10:00 - 11:00	44.9	47.4	50.9	43.9	44.0
L90(avg)*	44.4	49.3	45.7	47.2	47.4

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

(Miss Katesarin Vorradetwittaya)
Environmental Scientist

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Noise Monitoring Result : Community Noise
MTR-SPRC PLC-Marine

Location : Ban Ao Pradu
Monitor Period : 17-22 Mar 2026
SLM Model : Cirrus CR161B
Serial No : G301331
Site Operator : Mr. Song Hengchwankun

Calibrator Model : Cirrus CR:515
Serial No : 97097
Calibration Ref dB(A) : 94.0
Certified Date : 14 Oct 2025
SLM Reading / Adjust dB(A) : 93.7/0.0
Expire Date : 13 Oct 2026
Cal Sheet No.: CR-515-2026-064

Time	Equivalent Sound Pressure Level (dB(A))				
	17-18 Mar 2026	18-19 Mar 2026	19-20 Mar 2026	20-21 Mar 2026	21-22 Mar 2026
11:00 - 12:00	58.5	60.0	58.8	61.7	56.6
12:00 - 13:00	58.7	57.2	56.8	59.6	62.0
13:00 - 14:00	56.0	59.0	55.2	55.0	55.0
14:00 - 15:00	56.7	56.6	55.3	54.5	54.3
15:00 - 16:00	58.5	55.8	56.0	60.6	55.6
16:00 - 17:00	59.2	61.0	59.9	60.0	57.3
17:00 - 18:00	62.8	62.9	63.5	63.1	60.6
18:00 - 19:00	60.6	59.2	58.9	61.6	58.7
19:00 - 20:00	57.9	59.1	61.1	59.5	60.9
20:00 - 21:00	56.7	57.9	55.1	54.4	57.3
21:00 - 22:00	59.9	54.7	53.7	59.0	53.5
22:00 - 23:00	56.5	57.8	55.8	53.5	58.3
23:00 - 00:00	54.3	53.5	55.2	57.3	54.3
00:00 - 01:00	52.6	54.7	55.2	50.5	53.8
01:00 - 02:00	61.5	53.9	54.1	50.1	56.7
02:00 - 03:00	53.3	52.3	53.3	51.9	53.6
03:00 - 04:00	53.1	53.2	54.0	52.3	53.4
04:00 - 05:00	52.3	53.8	54.2	53.0	53.3
05:00 - 06:00	52.7	57.6	55.3	51.8	53.8
06:00 - 07:00	58.4	59.8	63.8	58.2	58.2
07:00 - 08:00	62.1	60.9	61.5	60.8	60.4
08:00 - 09:00	58.6	57.3	58.4	56.1	56.3
09:00 - 10:00	56.1	55.5	56.2	53.7	55.9
10:00 - 11:00	56.0	56.6	56.9	56.3	55.1
Leq(24)*	58.2	58.0	58.2	58.0	57.3
Ldn	63.2	62.9	63.9	61.8	62.4
Lmax **	99.3	95.5	102.2	98.4	99.7
Standard-24Hr	70 dB(A)				
Standard-Max	115 dB(A)				

Remark : * Average time between 11:00-11:00
** Maximum Sound Pressure Level between 11:00-11:00

(Miss Katesarin Vorradetwittaya)
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Noise Monitoring Result : Background Noise
MTR-SPRC PLC-Marine

Location : Ban Ao Pradu
Monitor Period : 17-22 Mar 2026
SLM Model : Cirrus CR161B
Serial No : G301331
Site Operator : Mr. Song Hengchwankun

Calibrator Model : Cirrus CR:515
Serial No : 97097
Calibration Ref dB(A) : 94.0
Certified Date : 14 Oct 2025
SLM Reading / Adjust dB(A) : 93.7/0.0
Expire Date : 13 Oct 2026
Cal Sheet No.: CR-515-2026-064

Time	L90 (dB(A))				
	17-18 Mar 2026	18-19 Mar 2026	19-20 Mar 2026	20-21 Mar 2026	21-22 Mar 2026
11:00 - 12:00	49.9	48.2	47.9	51.4	48.5
12:00 - 13:00	49.4	48.5	50.2	50.9	49.6
13:00 - 14:00	49.6	46.9	50.4	50.3	50.9
14:00 - 15:00	51.5	46.5	50.7	51.2	50.7
15:00 - 16:00	50.7	47.4	51.4	51.5	51.7
16:00 - 17:00	49.6	51.2	51.5	51.9	51.4
17:00 - 18:00	50.9	53.1	53.3	52.3	50.6
18:00 - 19:00	52.0	52.5	52.3	51.8	51.4
19:00 - 20:00	50.8	51.1	50.1	50.3	51.3
20:00 - 21:00	51.0	49.9	50.8	49.4	51.3
21:00 - 22:00	51.6	48.9	50.8	48.3	51.0
22:00 - 23:00	52.6	49.7	52.6	48.7	51.5
23:00 - 00:00	51.8	51.8	52.4	49.3	51.4
00:00 - 01:00	51.1	51.9	52.6	47.6	51.2
01:00 - 02:00	50.6	51.3	52.9	48.1	51.8
02:00 - 03:00	49.0	51.0	52.1	50.2	51.9
03:00 - 04:00	50.9	50.2	52.7	49.0	52.0
04:00 - 05:00	49.2	51.1	52.5	48.5	51.8
05:00 - 06:00	48.6	53.1	53.3	48.3	51.7
06:00 - 07:00	51.4	53.0	54.4	50.6	53.2
07:00 - 08:00	52.3	52.5	54.8	50.3	52.8
08:00 - 09:00	52.0	50.4	53.7	49.2	52.1
09:00 - 10:00	49.4	47.6	51.4	46.9	51.6
10:00 - 11:00	49.2	47.3	51.0	47.7	51.8
L90(avg)*	50.8	50.7	52.2	50.0	51.5

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

(Miss Katesarin Vorradetwittaya)
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ใบรับรองผลการตรวจวัดนิเวศแหล่งน้ำและการประมง

สถานีวิจัยประมงศรีราชา
101/12 หมู่ 9 ต.บางพระ
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โทร./โทรสาร. (038) 311379

รายงานผลการวิเคราะห์แพลงก์ตอนพืชและแพลงก์ตอนสัตว์

ตาราง ผลการวิเคราะห์แพลงก์ตอนพืชและแพลงก์ตอนสัตว์ (เก็บตัวอย่างวันที่ 8 พฤษภาคม 2569)

ชนิดของแพลงก์ตอน	ปริมาณแพลงก์ตอน (หน่วยต่อลูกบาศก์เมตร)			
	S1	S2	S3	S4
แพลงก์ตอนพืช				
Division Cyanophyta				
Class Cyanophyceae				
Order Nostocales				
Family Oscillatoriaceae				
Oscillatoria sp.	-	-	109,000	-
Oscillatoria tenuis	171,000	23,000	55,000	113,000
Family Nostocaceae				
Pseudanabaena sp.	11,000	23,000	55,000	47,000
Division Chlorophyta				
Class Chlorophyceae				
Order Chlorococcales				
Family Hydrodictyaceae				
Pediastrum simplex	-	-	-	9,000
Family Coelastraceae				
Coelastrum microporum	-	-	11,000	-
Family Scenedesmaceae				
Scenedesmus quadricauda	32,000	11,000	22,000	-

ตาราง ผลการวิเคราะห์แพลงก์ตอนพืชและแพลงก์ตอนสัตว์ (เก็บตัวอย่างวันที่ 8 พฤษภาคม 2569)

(ต่อ)

ชนิดของแพลงก์ตอน	ปริมาณแพลงก์ตอน (หน่วยต่อลูกบาศก์เมตร)			
	S1	S2	S3	S4
Class Euglenophyceae				
Order Euglenales				
Family Euglenaceae				
Euglena acus	-	-	11,000	-
Division Chromophyta				
Class Bacillariophyceae				
Order Biddulphales				
Suborder Coscinodiscineae				
Family Thalassiosiraceae				
Cyclotella striata	161,000	23,000	392,000	19,000
Family Melosiraceae				
Melosira nummuloides	-	-	44,000	-
Family Aulacoseiraceae				
Aulacoseira granulata	118,000	-	-	-
Family Coscinodiscaceae				
Coscinodiscus radiatus	171,000	-	11,000	-
Coscinodiscus sp.	-	11,000	-	-
Family Hemidiscaceae				
Actinopcychus grundleri	118,000	11,000	-	-
Suborder Rhizosoleniineae				
Family Rhizosoleniaceae				
Proboscia alata	21,000	-	-	-
Rhizosolenia pungens	107,000	272,000	22,000	29,000
Rhizosolenia sp.	11,000	-	-	-

ตาราง **ผลการวิเคราะห์แพลงก์ตอนพืชและแพลงก์ตอนสัตว์** (เก็บตัวอย่างวันที่ 8 พฤษภาคม 2569)

(ต่อ)

ชนิดของแพลงก์ตอน	ปริมาณแพลงก์ตอน (หน่วยต่อลูกบาศก์เมตร)			
	S1	S2	S3	S4
Suborder Biddulphiineaae				
Family Hemiaulaceae				
Cerataulina pelagica	96,000	-	-	9,000
Hemiaulus sinensis	-	34,000	-	-
Hemidiscus cuneiformis	257,000	-	-	-
Family Chaetoceraceae				
Bacteriastrum furcatum	128,000	-	-	-
Chaetoceros diversus	32,000	-	-	9,000
Chaetoceros furcellatus	628,925,000	174,030,000	501,400,000	171,353,000
Chaetoceros laciniosus	118,000	-	-	19,000
Chaetoceros lorenzianus	-	-	33,000	-
Chaetoceros peruvianus	21,000	-	-	19,000
Family Eupodiscaceae				
Odontella sinensis	11,000	11,000	-	-
Order Bacillariales				
Suborder Fragilariineae				
Family Thalassionemataceae				
Thalassionema frauenfeldii	-	11,000	-	-
Thalassiosira sp.	-	45,000	196,000	-
Family Licmophoriaceae				
Licmophora abbreviata	-	11,000	-	-
Suborder Bacillariineae				
Family Achnanthaceae				
Cocconeis scutellum	-	11,000	-	-
Family Naviculaceae				
Amphipleura rutilans	-	57,000	-	-

ตาราง ผลการวิเคราะห์แพลงก์ตอนพืชและแพลงก์ตอนสัตว์ (เก็บตัวอย่างวันที่ 8 พฤษภาคม 2569)

(ต่อ)

ชนิดของแพลงก์ตอน	ปริมาณแพลงก์ตอน (หน่วยต่อลูกบาศก์เมตร)			
	S1	S2	S3	S4
Amphora exigua	-	-	22,000	-
Amphora sp.	11,000	-	11,000	-
Diploneis ovalis	-	11,000	-	-
Meuniera membranacea	-	-	-	19,000
Navicula cuspidata	-	-	33,000	-
Navicula lanceolata	-	-	22,000	-
Navicula sp.	-	11,000	-	-
Pleurosigma angulatum	11,000	11,000	11,000	-
Pleurosigma sp.	-	23,000	-	-
Trachyneis sp.	32,000	11,000	-	-
Family Bacillariaceae				
Cylindrotheca closterium	11,000	-	11,000	-
Nitzchia recta	-	-	33,000	-
Nitzschia sigmoidea	-	-	11,000	-
Pseudo-nitzschia sp.	107,000	-	-	-
Family Surirellaceae				
Entomoneis robusta	-	11,000	-	-
Class Dinophyceae				
Order Prorocentrales				
Family Prorocentraceae				
Prorocentrum mexicanum	21,000	-	-	-
Prorocentrum micans	321,000	-	-	-
Prorocentrum sigmoides	64,000	-	-	-
Order Gymnodiniales				
Family Gymnodinium				
Gyrodinium spirale	11,000	-	-	-

ตาราง ผลการวิเคราะห์แพลงก์ตอนพืชและแพลงก์ตอนสัตว์ (เก็บตัวอย่างวันที่ 8 พฤษภาคม 2569)

(ต่อ)

ชนิดของแพลงก์ตอน	ปริมาณแพลงก์ตอน (หน่วยต่อลูกบาศก์เมตร)			
	S1	S2	S3	S4
Order Gonyaulacalea				
Family Ceratiaceae				
Ceratium furca	32,000	-	-	-
Ceratium fusus	64,000	-	-	-
Ceratium macroceros	96,000	-	-	94,000
Ceratium porrectum	11,000	-	-	-
Ceratium sp.	-	-	-	9,000
Ceratium trichoceros	118,000	-	-	103,000
Family Gonyaulacaceae				
Gonyaulax diegensis	342,000	-	-	-
Gonyaulax sp.	32,000	-	164,000	38,000
Order Peridiniales				
Family Calciodinellaceae				
Scrippsiella trocoidea	32,000	-	131,000	19,000
Family Protoperidiniaceae				
Protoperidinium angustum	43,000	-	-	9,000
Protoperidinium conicum	214,000	-	44,000	19,000
Protoperidinium curtipes	193,000	-	11,000	19,000
Protoperidinium curvipes	21,000	-	-	-
Protoperidinium depressum	21,000	-	11,000	29,000
Protoperidinium latispinum	32,000	-	-	-
Protoperidinium oblongum	32,000	-	-	-
Protoperidinium pellucidum	-	-	-	47,000
Protoperidinium punctulatum	-	-	11,000	47,000
Protoperidinium sp.	471,000	182,000	218,000	301,000
Protoperidinium spinulosum	-	-	-	56,000

ตาราง ผลการวิเคราะห์แพลงก์ตอนพืชและแพลงก์ตอนสัตว์ (เก็บตัวอย่างวันที่ 8 พฤษภาคม 2569)

(ต่อ)

ชนิดของแพลงก์ตอน	ปริมาณแพลงก์ตอน (หน่วยต่อลูกบาศก์เมตร)			
	S1	S2	S3	S4
แพลงก์ตอนสัตว์				
Phylum Protozoa				
Subphylum Ciliophora				
Class Ciliata				
Subclass Spirotricha				
Order Tintinnida				
Family Tintinnididae				
Leprotintinnus nordquisti	96,000	-	-	19,000
Family Codonellidae				
Tintinnopsis gracile	11,000	-	-	-
Tintinnopsis loricata	-	-	11,000	-
Tintinnopsis radix	21,000	-	-	-
Tintinnopsis sp.	-	-	11,000	9,000
Tintinnopsis subacuta	-	11,000	44,000	-
Family Cyttarocylidae				
Favella ehrenbergii	11,000	34,000	44,000	-
Favella panamensis	21,000	-	-	9,000
Family Petalotrichidae				
Metacylis pithos	43,000	-	-	-
Family Tintinnidae				
Eutintinnus fraknoii	11,000	-	-	-
Phylum Annelida				
Class Polychaeta				
Polychaete larvae	-	-	-	9,000

ตาราง ผลการวิเคราะห์แพลงก์ตอนพืชและแพลงก์ตอนสัตว์ (เก็บตัวอย่างวันที่ 8 พฤษภาคม 2569)

(ต่อ)

ชนิดของแพลงก์ตอน	ปริมาณแพลงก์ตอน (หน่วยต่อลูกบาศก์เมตร)			
	S1	S2	S3	S4
Phylum Arthropoda				
Class Crustacea				
Subclass Copepoda				
Copepod nuaplius	813,000	125,000	65,000	150,000
Order Calanoida				
Calanoid copepod	-	-	11,000	-
Order Harpacticoida				
Harpacticoid copepod	43,000	11,000	-	-
Phylum Mollusca				
Class Gastropoda				
Gastropod larvae	75,000	-	-	66,000
Class Bivalvia				
Pelecypod larvae	-	23,000	33,000	9,000
Phylum Echinodermata				
Class Ophiuroidae				
Ophiopluteus larvae	11,000	-	-	-
Phylum Chordata				
Subphylum Urochordata				
Class Larvacea				
Order Urochorda				
Family Oikopleuridae				
Oikopleura dioica	11,000	-	-	9,000
Oikopleura sp.	32,000	-	-	-
ชนิดของแพลงก์ตอนพืช	**43**	**22**	**28**	**24**
ชนิดของแพลงก์ตอนสัตว์	**13**	**5**	**7**	**8**
ชนิดแพลงก์ตอนรวม	**56**	**27**	**35**	**32**

ตาราง ผลการวิเคราะห์แพลงก์ตอนพืชและแพลงก์ตอนสัตว์ (เก็บตัวอย่างวันที่ 8 พฤษภาคม 2569)

(ต่อ)

ชนิดของแพลงก์ตอน	ปริมาณแพลงก์ตอน (หน่วยต่อลูกบาศก์เมตร)			
	S1	S2	S3	S4
ปริมาณแพลงก์ตอนพืช	632,852,000	174,844,000	503,105,000	172,435,000
ปริมาณแพลงก์ตอนสัตว์	1,199,000	204,000	219,000	280,000
ปริมาณแพลงก์ตอนรวม	634,051,000	175,048,000	503,324,000	172,715,000
ค่าดัชนีความหลากหลายแพลงก์ตอนพืช	0.0578	0.0403	0.0316	0.0544
ค่าดัชนีความหลากหลายแพลงก์ตอนสัตว์	1.3313	1.1598	1.7413	1.4100
ค่าดัชนีความสม่ำเสมอแพลงก์ตอนพืช	0.0154	0.0130	0.0095	0.0171
ค่าดัชนีความสม่ำเสมอแพลงก์ตอนสัตว์	0.5190	0.7206	0.8949	0.6781

.....

(นางสาวกนกวรรณ ขาวด่อน)
ผู้วิเคราะห์

.....

(นายอลงกต อินทรชาติ)
หัวหน้าสถานีวิจัยประมงศรีราชา

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

รายงานผลการวิเคราะห์สัตว์หน้าดิน

ตาราง ผลการวิเคราะห์สัตว์หน้าดิน (เก็บตัวอย่างวันที่ 8 พฤษภาคม 2569)

สกุลสัตว์หน้าดิน	ปริมาณสัตว์หน้าดิน (ตัวต่อตารางเมตร)			
	S1	S2	S3	S4
Phylum Annelida				
Class Polychaeta				
Order Capitellida				
Family Capitellidae				
Heteromastus sp. (ไส้เดือนทะเล)	-	60	-	-
Order Eunicida				
Family Eunicidae				
Lysidice sp. (ไส้เดือนทะเล)	30	-	-	-
Marphysa sp. (ไส้เดือนทะเล)	-	-	30	-
Family Onuphidae				
Diopatra sp. (ไส้เดือนทะเล)	-	15	-	-
Order Phyllodocida				
Family Nephtyidae				
Nephtys sp. (ไส้เดือนทะเล)	15	-	-	15
Family Nereididae				
Nereis sp. (แม่เพรียง)	-	30	-	-
Order Terebellida				
Family Cirratulidae				
Cirratulus sp. (ไส้เดือนทะเล)	-	149	-	-

ตาราง ผลการวิเคราะห์สัตว์หน้าดิน (เก็บตัวอย่างวันที่ 8 พฤษภาคม 2569) (ต่อ)

สกุลสัตว์หน้าดิน	ปริมาณสัตว์หน้าดิน (ตัวต่อตารางเมตร)			
	S1	S2	S3	S4
Phylum Arthropoda				
Class Malacostraca				
Order Decapoda				
Family Diogenidae				
Diogenes sp. (ปูเสฉวน)	149	-	-	-
Order Isopoda				
Family Cirolanidae				
Cirolana sp. (ไอโซพอด)	-	-	-	30
Phylum Mollusca				
Class Bivalvia				
Order Carditida				
Family Crassatellidae				
Bathytormus sp. (หอยสองฝาชนิดหนึ่ง)	-	15	-	-
Order Venerida				
Family Veneridae				
Paphia sp. (หอยลาย)	-	15	-	-
Phylum Echinodermata				
Class Echinoidea				
Order Camarodontaa				
Family Temnopleuridae				
Temnopleurus sp. (เม่นทะเล)	-	-	-	238
Phylum Chordata				
Class Leptocardii				
Order Amphioxiformes				
Family Branchiostomidae				
Branchiostoma sp. (แอมฟิออกซัส)	430	-	30	119

ตาราง ผลการวิเคราะห์สัตว์หน้าดิน (เก็บตัวอย่างวันที่ 8 พฤษภาคม 2569) (ต่อ)

สกุลสัตว์หน้าดิน	ปริมาณสัตว์หน้าดิน (ตัวต่อตารางเมตร)			
	S1	S2	S3	S4
สกุลสัตว์หน้าดิน	4	6	2	4
ปริมาณสัตว์หน้าดิน	624	284	60	402
ค่าดัชนีความหลากหลายสัตว์หน้าดิน	0.8341	1.3703	0.6931	0.9871

หมายเหตุ : 1. สถานี S1 : เกาะสะเก็ด

2. สถานี S2 : หาดทรายทอง

3. สถานี S3 : จุดระบายน้ำทิ้งของโรงกลั่นน้ำมันลงทะเล

4. สถานี S4 : ทะเลเปิด

.....

(นายอรรถวุฒิ กันทะวงศ์)

ผู้วิเคราะห์

.....

(นายอลงกต อินทรชาติ)

หัวหน้าสถานีวิจัยประมงศรีราชา

ภาคผนวก ง

ข้อมูลการตรวจเทียบเครื่องมือตรวจวัด

(Calibration Data Sheets)

Sheet No. : CAL-M5006/01/25

CONTROL UNIT CALIBRATION
(Metric units, mm)

Date: 6 Jan 25

	Initial	Final	Average	
Barometric press, Pb	758	758	758	mmHg

Dry Gas Meter Data

Console No.: M50-06
Metering System ID:
DGM Number: 917415
DGM Model: MST-C2-1
Calibrated by : Montri P.

Reference Dry Gas Meter Data

Serial No.: 358794
Model: S110
Correction factor (Yr): 1.0077
Last Calibration Date: 25 Oct 24

Orifice manometer setting, ΔH mm H2O	Ref. DGM Volume V_r Liters	DGM Volume V_m Liters	Temperature (°C) Ref DGM T_r	Dry Gas Meter Inlet T_i	Dry Gas Meter Outlet T_o	Dry Gas Meter Avg T_m	Time Θ min	DGM Correction factor (Y)	ΔH@ mm
12.5	100.0	99.8	25	25	24	24.5	8.92	1.0071	45.1453
25.0	100.2	100.4	25	25	24	24.5	6.13	1.0020	42.5581
50.0	100.0	100.9	25	25	24	24.5	4.33	0.9923	42.6407
76.0	100.1	102.5	25	25	24	24.5	3.53	0.9756	43.0400
100.0	100.1	102.2	25	25	24	24.5	3.53	0.9755	43.5926
150.0	100.0	101.5	25	25	24	24.5	2.53	0.9774	43.7294
							Average	0.9883	43.4510

Approved by :

SECOT CO., LTD.
239 Rinklongwapa Rd. Bangsue, Bangkok, 10800, THAILAND
Tel: (662) 5593600 Fax: (662) 9592535
E-Mail: envserv@secot.co.th

Sheet No. : CAL-PI-PS10-01/2025

PITOT TUBE CALIBRATION REPORT

Calibration Location: SECOT
Calibration Duct No.: CD-0123
Calibration Date : 03-01-2025

Calibration Standard Pitot tube data
Pitot No. : Std-02
Type S Pitot No. : PS10-01
Coefficient (Cp) : 0.99

Calibrated by : Mr. Montri P.

A Side Calibration

Run No.	ΔPstd (mm H_2O)	ΔPs (mm H_2O)	Cp(s)	Deviation,δ Cp(s) -Cp(A)
1	15.0	21.0	0.8367	-0.0034
2	15.0	20.5	0.8468	0.0068
3	15.0	21.0	0.8367	-0.0034

$C_{P(A)}$,avg = 0.8401

B Side Calibration

Run No.	ΔPstd (mm H_2O)	ΔPs (mm H_2O)	Cp(s)	Deviation,δ Cp(s) -Cp(B)
1	15.0	21.0	0.8367	-0.0034
2	15.0	20.5	0.8468	0.0068
3	15.0	21.0	0.8367	-0.0034

$C_{P(B)}$,avg = 0.8401

| CP(A)-CP(B) | = 0.0000
$C_{P(Avg)}$ = 0.8401

Approved by :

*** δ must be ≤ 0.01 for the test to be acceptable ***
*** | Cp(A)-Cp(B) | must also be < 0.01 if average of Cp(A) and Cp(B) is ot be used ***

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ELECTRICAL AND ELECTRONICS INSTITUTE
FOUNDATION FOR INDUSTRIAL DEVELOPMENT
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Phraek Sa, Mueang Samut Prakan, Samut Prakan 10280
Tel: +66 2709 4860 Fax: +66 2324 0917

NSC-TISI-TIS 17025
CALIBRATION 0119

Certificate No.: CP20250278EA
Operation No.: CP2025100271

Certificate of Calibration

Equipment:	Sound Calibrator
Manufacturer:	Cirrus Research Plc
Model/Type:	CR:515
Serial No.:	97097
ID No.:	-
Customer:	SECOT Co.,Ltd.
Address:	239 Rimklongprapa Rd., Bangsue, Bangkok 10800 Thailand
Received Date:	9 October 2025
Calibrated Date:	14 October 2025
Issued Date:	16 October 2025
Calibrated by:	Ms. Juntaporn Kunhakom

Approved by: _____
(Mr. Sittichai Swaksuriyawong)
Group Manager

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

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

Certificate No.: CP20250278EA

Calibration Report

Equipment:	Sound Calibrator
Manufacturer:	Cirrus Research Plc
Model/Type:	CR:515
Serial No.:	97097
ID No.:	-
Ambient Temperature:	(23 ± 2) °C
Relative Humidity:	(50 ± 15) %
Pressure:	(101.3 ± 1.5) kPa

Method of Calibration :-
IEC 60942:2017

Condition of this result of calibration

1. Reference standards instrument :-

	Instrument	Model	Serial No.	Cert. No.	Due Date
1)	Standard microphone	4180	2661000	AA-1011-25	24 June 2026
2)	Waveform Generator	33511B	MY52302264	CK20250036EA	29 June 2026
3)	Audio Analyzing DMM	2015-P	000136E	CK20250002EA CB20250007EA	25 December 2025 6 January 2026
4)	Pressure humidity and Temperature Transmitter	PTU301	F0640003	CL1-P250034 CD20250096EA	10 April 2026 29 March 2026

2. This result of calibration was found accurate as shown on date and place of calibration only.
3. This certification is traceable to the international system of unit maintained at :-
   Reference standards instrument for Acoustic function
   - National Institute of Metrology (Thailand).; ILAC Policy, Item 2 (1) No.ILAC-P10:07/2020.
   Reference standards instrument for Electrical function
   - Electrical and Electronics Institute; NSC Accredited Calibration No.0119
   - IRPC Metrology Center, IRPC Public Co., Ltd.; NSC Accredited Calibration No.0204.

Result of Calibration:-

1. Function : Sound pressure level

Norminal Frequency (Hz)	Specified Sound Pressure level (dB)	Measured value (dB)	Deviated value[1] (dB)	Acceptance limit[3] (dB)
1000	94	94.07	0.07	±0.25

2. Function : Frequency

Norminal Sound Pressure level (dB)	Specified Frequency (Hz)	Measured value (Hz)	Deviated value[2] (%)	Acceptance limit[3] (%)
94	1000	1000.31	0.03	±.0.70

สถาบันไฟฟ้าและวิศิกรรมนิกส์
ELECTRICAL AND ELECTRONICS INSTITUTE

ELECTRICAL AND ELECTRONICS INSTITUTE
FOUNDATION FOR INDUSTRIAL DEVELOPMENT

Certificate No.: CP20250278EA

Calibration Report

3. Function : Total distortion + noise

Norminal Sound Pressure level (dB)	Norminal Frequency (Hz)	Measured value[4] (%)	Acceptance limit[5] (%)
94	1000	0.47	2.50

Uncertainty of measurement

Function	Uncertainty	Maximum-permitted uncertainty of measurement
Sound pressure level	0.10 dB	0.15 dB
Frequency	0.10 %	0.20 %
Total distortion + noise	0.40 %	0.50 %

Note: [1] The deviated value is the absolube valule of the difference between the measured value and the corresponding specified sound pressure level.
[2] The deviated value is the absolube valule of the difference in percent between the measured value and the corresponding specified frequency.
[3] The acceptance limit is for the deviated value.
[4] The measured value is the total distortion + noise, measured over the frequency range from 20 Hz to 20 kHz.
[5] The acceptance limit is for the Measured value.

Remarks: 1. Acceptance limit was IEC 60942:2017 Class 1.
2. Maximum-permitted uncertainty of measurement was IEC 60942:2017 Class 1.
3. The coverage factor k = 2.00

- - End of Report - -

Sheet No. : CR-515-2026-064

SOUND LEVEL METER CALIBRATION

Calibration Location: SECOT Calibration Date: Mar 17, 26

ACOUSTIC CALIBRATOR

Brand	Model	Serial No.	Frequency (Hz)	Ref.Calibrated (dB)	Eff.Calibrated (dB)
Cirrus	CR:515	97097	1000.00	94.0	93.7

No.	Brand	Model	Serial No.	Reading (dB)	dB Adjust
9	Cirrus	CR161B	G301331	93.7	0.0
55	Cirrus	CR161B	G303830	93.7	0.0
57	Cirrus	CR161B	G303827	93.7	0.0
58	Cirrus	CR161B	G303833	93.7	0.0

Calibrated by : _____ Approved by : Preeda S.

SECOT CO., LTD.
239 Rimklongprapa Rd. Bangsue, Bangkok, 10800, THAILAND
Tel: (662)959-3600 Fax: (662) 959-3535
E-Mail: envserv@secot.co.th

THAI CALIBRATION SERVICES CO., LTD.
19/8 Moo 9 Soi Raikhing 30, Phutthamonthon 5 Rd., Raikhing,
Samphran, Nakhonpathom 73210 Tel. 0-3439-7682-5, 08-6341-8613
www.thaical.com E-mail : sales@thaicalibration.com, lab@thaicalibration.com

NSC-TISI-TIS 17025 CALIBRATION 0189

CALIBRATION CERTIFICATE

Certificate No.S2604485S

Customer : SECOT CO., LTD.
239 Rimklongprapa Rd.,
Bangsue, Bangkok 10800

Equipment : Non-automatic weighing instrument (Electronic instrument)

Manufacturer :	Mettler Toledo	**Order No. :**	69S1571-1
Model :	AG245	**Ambient temperature :**	(27.4 ± 5.0) °C
Accuracy class :	-	**Relative humidity :**	(46.0 ± 10.0) %
Capacity :	41 g / 210 g	**Received date :**	20-Apr-2026
Resolution :	0.00001 g / 0.0001 g	**Date of calibration :**	20-Apr-2026
Serial No. :	1117293916	**Date of issue :**	23-Apr-2026
ID No. :	-	**Condition of the balance :**	Good working conditions

Place of calibration : BAL

Calibration method

This instrument was calibrated according to the EURAMET Calibration Guide No. 18.

Condition of reference standard weight

Instrument	Nominal value	Serial No.	Certificate No.	Due-date	Density (kg/m^3)
1 Standard weight set	1 mg to 2 kg	15885+15849	M2510001S	7-Oct-2026	7950

Traceability of the reference standard weight

The measurement results are traceable to the International System of Units (SI) through Mass Calibration Laboratory Thai Calibration Services Co., Ltd., NSC-ONSC accredited no. Calibration 0189.

Calibrated By : Chartchai Rattanaapichartwong
Technician

Approved Signatory : Somwang Wongduang

This calibration certificate may not be reproduced other than in full, except with the prior written approval of the head of TCS calibration laboratory.

THAI CALIBRATION SERVICES CO., LTD.
19/8 Moo 9 Soi Raikhing 30, Phutthamonthon 5 Rd., Raikhing,
Samphran, Nakhonpathom 73210 Tel. 0-3439-7682-5, 08-6341-8613
www.thaical.com E-mail : sales@thaicalibration.com, lab@thaicalibration.com

NSC-TISI-TIS 17025 CALIBRATION 0189

CALIBRATION CERTIFICATE

Certificate No.S2604485S

The repeatability of indication

Nominal Value (g)	Standard Deviation of reading (g)	Maximum difference between successive reading (g)	n
40	0.000005	0.00001	5
200	0.00004	0.0001	5

The effect of eccentric application of a load on the indication (test load : 100 g)

Position	Balance Reading (g)
Point 1	99.9999
Point 2	99.9997
Point 3	99.9999
Point 4	99.9998
Point 5	99.9998
Eccentric Value	0.0002

The error of indication

Nominal Value (g)	Value of Reference Standard Weight (g)	Balance Reading (g)	Correction (g)	Uncertainty (±) (g)	k
Unload	0.00000	0.00000	0.00000	0.000016	2.52
0.5	0.49999	0.50001	-0.00002	0.000023	2.04
1	1.00000	1.00000	0.00000	0.000026	2.00
10	9.99997	10.00000	-0.00003	0.000046	2.00
20	19.99996	20.00001	-0.00005	0.000062	2.00
40	40.00000	39.99999	+0.00001	0.00013	2.00
60	60.0000	60.0000	0.0000	0.00018	2.05
80	79.9999	79.9999	0.0000	0.00022	2.00
100	99.9999	99.9999	0.0000	0.00020	2.03
120	119.9999	119.9999	0.0000	0.00025	2.00
140	139.9999	139.9999	0.0000	0.00030	2.00
160	159.9999	159.9999	0.0000	0.00031	2.00
180	179.9999	180.0000	-0.0001	0.00037	2.00
200	200.0000	200.0000	0.0000	0.00033	2.00

Remark : Adjustment, External weight nominal value 200 g, Standard weight of Lab

Uncertainty of measurement

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor (k), which for a normal distribution corresponds to a coverage probability of approximately 95% (confidence level).

This report will certify of the calibrated equipment only.

--End--

TCS-F-138 Issue 01/Rev.02/8 Aug 2025

Request Service No.090/69

Calibration Certificate

Nomenclature : Brand : Sartorius Type : Top-Loading Electronic Balance

Model : BSA224S-CW Serial No. : 32191636

Submitted by : Laboratory of SECOT CO., LTD.

Location of Calibration : BAL Room , 6th Floor, Secot Co., Ltd.

Calibration range : 0 – 200 g Scale division : 0.0001 g (220 g)

Calibration date : May 21,2026

Reference Standard M2602136S, M2502078S, M2602137S, M2502079S

Traceable to : Thai Caribration Services CO., LTD.

Ambient Condition : Temperature 24.40-24.90 °C

Humidity 47.2-48.5 % RH

Calibrated By : ..... Approved By : .....

(Miss Khemchuda Insorn) (Miss Narisa Poowasanpetch)

Testing Officer Chief of Technical Management

Date : ..... Date : .....

Issued Date : May 22,2026

Measurement Report

Request Service No.090/69

Description : Brand : Sartorius Type : Top-Loading Electronic Balance

Model : BSA224S-CW Serial No. : 32191636

Calibration range : 0 – 200 g Scale division : 0.0001 g (220 g)

Calibration date : May 21,2026

Ambient Condition : Temperature 24.40-24.90 °C Relative humidity 47.2-48.5 % RH

Measurement data :

1. Repeatability of Reading :

Load (g)	Standard Deviation of Reading (g)	Maximum Difference between Successive Reading (g)
50	0.00005	0.0002
100	0.00005	0.0002
150	0.00005	0.0001
200	0.00004	0.0001

2. Off-Center Loading :

A Mass of 50.0000 g was placed and moved to various position on the pan.

Unit : g

Center	Front	Left	Back	Right	Center	Maximum Difference
49.99992	49.99992	49.99992	49.99990	49.99990	49.99992	0.00002

Issued Date : May 22,2026

3. Departure from Nominal Valve :

Reading (g)	Correction (g)	Uncertainty (+/- g)
0	0.00000	± 0.00007
1	+ 0.00003	± 0.00007
5	+ 0.00005	± 0.00008
10	+ 0.00006	± 0.00008
20	+ 0.00007	± 0.00008
40	+ 0.00006	± 0.00010
60	+ 0.0005	± 0.00011
80	+ 0.00008	± 0.00013
100	+ 0.00004	± 0.00016
120	+ 0.00003	± 0.00018
140	+ 0.00008	± 0.00020
160	+ 0.00005	± 0.00022
180	+ 0.00002	± 0.00024
200	+ 0.00003	± 0.00027

Calibrated by : Khemchuda Insorn ..... Approved By : Narisa Poowasanpetch

(Miss Khemchuda Insorn) — Testing Officer — Date : 22/05/2026

(Miss Narisa Poowasanpetch) — Chief of Technical Management — Date : 22/05/2026

Issued Date : May 22,2026

nfi national food institute ministry of industry
สถาบันอาหาร กระทรวงอุตสาหกรรม
ศูนย์บริการห้องปฏิบัติการสถาบันอาหาร
Foundation for Industrial Development National Food Institute
Food Industrial Laboratory Service Center

ilac-MRA

NSC-TISI-TIS 17025
CALIBRATION 0061

Calibration Certificate

Certificate No.: 2503897-003-01
Client name: SECOT CO., LTD.
Address: 239 Rimklongprapa Road,
Bangsue, Bangsue, Bangkok 10800

Equipment: CHAMBER (Hot Air Oven)
Manufacturer: BINDER
Model: ED 53
Serial No.: 01-27152
ID No.: N/A
Order No.: 2503897
Operation No.: 2503897-003
Date of Receipt: 14 July 2025
Date of Calibration: 14 July 2025

Calibrated by Mr.Yothin Charoensuk, Scientist

Approved by (Mr.Pheraphat Tuanjit)
Manager, Division of Calibration Laboratory
Responsible for the Technical Management Team

Date of Issue: 17 July 2025

The uncertainties are for a confidence probability of approximately 95 %.

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the National Food Institute.

2008 ซอยอรุณอมรินทร์ 36 ถนนอรุณอมรินทร์ แขวงบางยี่ขัน เขตบางพลัด กรุงเทพมหานคร 10700
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nfi.or.th

สุดสาหกรรมพัฒนามูลนิธิเพื่อสถาบันอาหาร
ศูนย์บริการห้องปฏิบัติการอุตสาหกรรมอาหาร
Foundation for Industrial Development National Food Institute
Food Industrial Laboratory Service Center

NSC-TISI-TIS 17025
CALIBRATION 0061

Calibration Report

Certificate No.: 2503897-003-01

Equipment: CHAMBER (Hot Air Oven)

Model: ED 53 Serial No.: 01-27152

Resolution: 1 °C ID No.: N/A

Manufacturer: BINDER

Date of Calibration: 14 July 2025

Location: Laboratory, SECOT CO., LTD.

Environment Condition:

Ambient Temperature (32.0 ± 1) °C

Relative Humidity (60.9 ± 1) %

Line Voltage (222.5 ± 3) Volt

Condition of this results of Calibration:

1. This instrument was calibrated by insert 9 standard thermometer into its chamber and calibration according to W-TE-014 Based on TLAS G-20-1/02-08 (E): Guidelines for Calibration and Checks of Temperature Controlled Enclosures.
   - The temperature scale used was based on ITS - 90.
   - All data show below were final values and the initial data may be obtained upon request.
2. Reference Standard Instrument :

Instrument	Model	Serial No./ID No.	Certificate No.	Due Date	Through
Digital Thermometer with sensor	34972A	MY57003188	2503175-002	2 June 2026	NATIONAL FOOD INSTITUTE
	RTD	CH#101-109/ RTD#101-109			

3. This certificate is traceable to International System of Units (SI Units).
4. This certificate was certified only for the instrument we calibrated.
5. This result of calibration was found accurate as shown on date and place of calibration only.
6. Condition of Calibrated item : Good

   UUC Description :

   Time of Record 1 Hour 9 Minute At 104,110 and 180 °C

   Fresh air Damper [-] Open Position [-]

   [X] Close Fan [-]

   [-] Not Available
7. Result of Calibration : [X] Without adjustment [ ] After adjustment

F-CS-012 Revision: 01 Date: 20-04-65

2008 ซอยอรุณอมรินทร์ 36 ถนนอรุณอมรินทร์ แขวงบางยี่ขัน เขตบางพลัด กรุงเทพมหานคร 10700
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สุดสาหกรรมพัฒนามูลนิธิเพื่อสถาบันอาหาร
ศูนย์บริการห้องปฏิบัติการอุตสาหกรรมอาหาร
Foundation for Industrial Development National Food Institute
Food Industrial Laboratory Service Center

NSC-TISI-TIS 17025
CALIBRATION 0061

Calibration Report

Certificate No.: 2503897-003-01

Equipment: CHAMBER (Hot Air Oven)

Model: ED 53 Serial No.: 01-27152

Resolution: 1 °C ID No.: N/A

Manufacturer: BINDER

Date of Calibration: 14 July 2025

Calibration point: 104,110 and 180 °C

Calibration result:

Calibration Condition	Temperature (°C)	Relative Humidity (%)	Line Voltage (Volt)
MIN	31.2	60.3	220.0
MAX	32.5	61.5	225.0

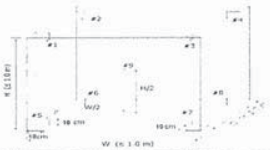

Table1 : Reporting of Temperature

Calibration point (°C)	Measured Temperature (°C) @ Sensor No. (Sensor No.9 is REF)									Uncertainty ± (°C)
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	
104	104.25	104.72	104.26	104.20	103.90	103.85	103.76	103.75	103.82	0.72
110	110.30	110.88	110.27	110.23	110.07	110.04	109.87	109.92	109.54	0.79
180	180.48	180.72	179.88	180.30	179.84	180.53	179.82	180.16	179.38	0.90

Table 2 : Reporting of Characterization Result

UUC* Setting (°C)	UUC* Reading (°C)			Stability ± (°C)	Uniformity (°C)	Overall Variation (°C)
	MIN	MAX	Average			
104	104	104	104	0.12	0.90	1.2
110	110	110	110	0.23	1.3	1.6
176	176	176	176	0.23	1.3	1.8

Note The quoted uncertainty include " Stability " and " Loading effect (20% of Temp Uniformity) "

UUC* = Unit Under Calibration

Stability = One-half of the greatest maximum difference of measured temperatures at any one sensors, for at least half an hour after reaching steady state.

Uniformity = The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time.

Overall Variation = The difference of the maximum and minimum measured temperatures througout observation time.

The report uncertainty of measurement was based on standard uncertainty multiplied by coverage factor k= 2, providing a level of confidence of approximately 95 %.

--------- End ---------

F-CS-012 Revision: 01 Date: 20-04-65

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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL.0-2717-3000-29 FAX.0-2719-9484

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NSC-TISI-TIS17025
CALIBRATION 0008

Certificate of Calibration

Cert.No.: 25CH1009
Page.: 1 of 3

Equipment :	pH Meter
Manufacturer :	Mettler Toledo
Model :	Seven2Go
Serial No. :	B924795409
ID No. :	ID.12
Condition As-Received:	Used Item
Received Date :	26 August 2025
Calibration Date :	27 August 2025
Reference :	2508-0784DN-3
Submitted by :	Secot Co.,Ltd. 239 Rimklongprapa Road, Bangsue, Bangkok 10800
Ambient Temperature :	(25 ± 2.5) °C
Relative Humidity :	(50 ± 15) %
Calibration Procedure :	In - house method : - CP-CH5 by direct measurement with DC voltage standard and direct measurement with certified reference material (CRM) - CP-CH8 by comparison with temperature standard
Calibrated by :	Walalak Sirithean
Approved by :	Saithip Approved Signatory

( ) Chakrit Waewwanjua
( ) Ponpan Paipim
(✓) Saithip Meangmai

Issue Date : 28 August 2025

The Uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full, except with the prior written Approval of the head of Corporate Services 3 : Equipment Calibration and Testing Services.

Condition of this calibration result

1. Reference Standard Instrument

Instrument	Serial No.	ID No.	Cert. No.	Due Date
1) Document Process Calibrator	58440003	130RC120	24E3731	25 Nov 2025
2) Ref. Standard Thermometer	4982054	110RC044	25I708	03 July 2026

- This measurement result is traceable to SI throught Technology Promotion Association (Thailand - Japan)

2. Certified Reference Materials : The measurement results are traceable to SI through CPA chem Ltd., ANSI-ASQ National Accreditation Board, Accredited No. AR-1835

Buffer Solution	Manufacturer	Lot No.	Exp. date
pH 4.007	CPA chem	1114384	12 June 2027
pH 6.987	CPA chem	1034204	27 Sep 2025
pH 10.010	CPA chem	1114385	08 June 2026

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

Calibration Results

Function : mV Measurement

Performing standard curve by Document Process Calibrator at pH (4,7,10)

Unit Under Calibration	Nominal Value	Standard Voltage Input	Actual Reading		Uncertainty of Measurement	Coverage factor
	pH	mV	mV	pH	(±mV)	*k*
pH Meter	4.00	177.48	177	4.00	0.58	2.00
S/N.: B924795409	7.00	0.00	0	7.00	0.58	2.00
	10.00	-177.48	-177	10.00	0.58	2.00

Calibration Results

Function : pH Measurement

Performing three buffers standard curve by using buffer nominal pH (4,7,10)

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reading	Actual mV Reading (mV)	Uncertainty of pH Measurement (±)	Coverage factor *k*
pH Electrode	4.007	4.02	182	0.0071	2.00
S/N.: 4320459	6.987	7.00	6	0.0095	2.00
	10.010	10.01	-167	0.0092	2.00

Function : Temperature Measurement

(*) Without adjustment

This equipment was connected with Temperature Probe;

- Model : InLab Expert Go
- Serial No. : 4320459

Dimension of probe

- Length : 120 mm.
- Diameter : 12 mm.
- Immersion Depth : 100 mm.

Calibration Point (°C)	Standard Temperature (°C)	UUC* Reading (°C)	Error (°C)	Uncertainty of measurement (± °C)	Coverage factor *k*
25.0	24.999	25.1	0.101	0.13	2.00
30.0	30.001	30.2	0.199	0.13	2.00
35.0	35.001	35.2	0.199	0.13	2.00

Remark - UUC* = Unit Under Calibration

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

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TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
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534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-3000 FAX. 0-2719-9484

Certificate of Testing

Equipment : DO Meter

Manufacturer : Hanna

Model : HI98193

Serial No. : 08300004101

ID No. : ID.11

Received Date : 26 August 2025

Test Date : 27 August 2025

Reference : 2508-0784DN-1

Submitted by : Secot Co.,Ltd.
239 Rimklongprapa Road,
Bangsue, Bangkok 10800

Laboratory Condition : Temperature (25 ± 5) °C
Humidity (50 ± 20) %

Test Procedure : In - house method : CP-CH9
by Comparison Technique with Azide Modification Method

Tested by : Walalak Sirithean

Approved by : Saithip
Approved Signatory

( ) Chakrit Waewwanjua
( ) Ponpan Paipim
(✓) Saithip Meangmai

Issue Date : 28 August 2025

Condition of this result of calibration

1. Reference Standard Instruments :
   This measurement result is traceable to the International System of Unit through the reference standards laboratory of Industrial Calibration Center, Technology Promotion Association (Thailand-Japan).

Instruments	ID No.	Certificate No.	Due Date
1. Burette	130BU10	25CG1126	18 Mar 2027
2. Balance	110RC001	25MM316	02 July 2026

2. Standard Material :-

Material	Manufacturer	Lot.No.	Assay
Sodium Thiosulfate 5-Hydrate AR	KEMAUS	2203162447	99.6%

Result : **Dissolved Oxygen Meter Adjustment With Air 100 %**
Dissolved Oxygen Probe No.: KC1N60V7R

Titration Method (Azide Modification Method) (mg/L)	DO Meter Reading (mg/L)	Standard Deviation (mg/L)
8.20	8.20	0.0055

This report was certified only for the instrument we tested.It is allowable to use for study Intend to use for advertising and referral purpose is prohibited.This report may not be reproduced other in full, without written approval of the laboratory

-o0o-

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ศูนย์บริการห้องปฏิบัติการอุตสาหกรรมอาหาร
Foundation for Industrial Development National Food Institute
Food Industrial Laboratory Service Center

NSC-TISI-TIS 17025
CALIBRATION 0061

Calibration Certificate

Certificate No.: 2503897-001-01
Client name: SECOT CO., LTD.
Address: 239 Rimklongprapa Road,
Bangsue, Bangsue, Bangkok 10800

Equipment: CHAMBER (Incubator)
Manufacturer: MEMMERT
Model: ICP 400
Serial No.: K406.0004
ID No.: N/A
Order No.: 2503897
Operation No.: 2503897-001
Date of Receipt: 14 July 2025
Date of Calibration: 14 July 2025

Calibrated by Mr.Yothin Charoensuk
Scientist

Approved by
(Mr.Pheraphat Tuanjit)
Manager, Division of Calibration Laboratory
Responsible for the Technical Management Team

Date of Issue: 17 July 2025

The uncertainties are for a confidence probability of approximately 95 %.

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the National Food Institute.

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ศูนย์บริการห้องปฏิบัติการอุตสาหกรรมอาหาร
Foundation for Industrial Development National Food Institute
Food Industrial Laboratory Service Center

NSC-TISI-TIS 17025
CALIBRATION 0061

Calibration Report

Certificate No.: 2503897-001-01

Equipment: CHAMBER (Incubator)

Model: ICP 400 Serial No.: K406.0004

Resolution: 0.1 °C ID No.: N/A

Manufacturer: MEMMERT

Date of Calibration: 14 July 2025

Location: Laboratory, SECOT CO., LTD.

Environment Condition: Ambient Temperature (30.8 ± 1) °C

Relative Humidity (60.9 ± 1) %

Line Voltage (222.5 ± 3) Volt

Condition of this results of Calibration:

1. This instrument was calibrated by insert 9 standard thermometer into its chamber and calibration according to W-TE-014 Based on TLAS G-20-1/02-08 (E): Guidelines for Calibration and Checks of Temperature Controlled Enclosures.
   - The temperature scale used was based on ITS - 90.
   - All data show below were final values and the initial data may be obtained upon request.
2. Reference Standard Instrument :

Instrument	Model	Serial No./ID No.	Certificate No.	Due Date	Through
Digital Thermometer with sensor	34972A	MY57003188	2503175-002	2 June 2026	NATIONAL FOOD INSTITUTE
	RTD	CH#201-209/ RTD#201-209			

3. This certificate is traceable to International System of Units (SI Units).
4. This certificate was certified only for the instrument we calibrated.
5. This result of calibration was found accurate as shown on date and place of calibration only.
6. Condition of Calibrated item : Good

   UUC Description :

   Time of Record 1 Hour 9 Minute At 20.0 °C

   Fresh air Damper [-] Open Position [-]

   [X] Close Fan [10%]

   [-] Not Available
7. Result of Calibration : [X] Without adjustment [ ] After adjustment

F-CS-012 Revision: 01 Date: 20-04-65

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Foundation for Industrial Development National Food Institute
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NSC-TISI-TIS 17025
CALIBRATION 0061

Calibration Report

Certificate No.: 2503897-001-01

Equipment: CHAMBER (Incubator)

Model: ICP 400 Serial No.: K406.0004

Resolution: 0.1 °C ID No.: N/A

Manufacturer: MEMMERT

Date of Calibration: 14 July 2025

Calibration point: 20.0 °C

Calibration result:

Calibration Condition	Temperature (°C)	Relative Humidity (%)	Line Voltage (Volt)
MIN	29.6	60.3	220.0
MAX	32.3	61.5	225.0

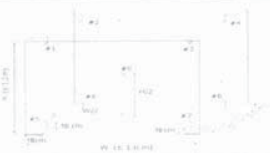

Table1 : Reporting of Temperature

Calibration point (°C)	Measured Temperature (°C) @ Sensor No. (Sensor No.9 is REF)									Uncertainty ± (°C)
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	
20.0	20.00	20.16	20.08	20.11	20.28	20.12	20.03	20.05	20.14	0.28

Table 2 : Reporting of Characterization Result

UUC* Setting (°C)	UUC* Reading (°C)			Stability ± (°C)	Uniformity (°C)	Overall Variation (°C)
	MIN	MAX	Average			
20.0	20.0	20.0	20.0	0.14	0.15	0.53

Note The quoted uncertainty include " Stability " and " Loading effect (20% of Temp Uniformity) "

UUC* = Unit Under Calibration

Stability = One-half of the greatest maximum difference of measured temperatures at any one sensors, for at least half an hour after reaching steady state.

Uniformity = The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time.

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The report uncertainty of measurement was based on standard uncertainty multiplied by coverage factor k= 2, providing a level of confidence of approximately 95 %.

--------- End ---------

F-CS-012 Revision: 01 Date: 20-04-65

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Food Industrial Laboratory Service Center

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THAILAND
NSC-TISI-TIS 17025
CALIBRATION 0061

Calibration Certificate

Certificate No.: 2503897-002-01
Client name: SECOT CO., LTD.
Address: 239 Rimklongprapa Road,
Bangsue, Bangsue, Bangkok 10800

Equipment: Water Bath

Manufacturer: MEMMERT

Model: WB 29

Serial No.: I698.0051

ID No.: N/A

Order No.: 2503897

Operation No.: 2503897-002

Date of Receipt: 14 July 2025

Date of Calibration: 14 July 2025

Calibrated by Mr.Yothin Charoensuk
Scientist

Approved by
(Mr.Pheraphat Tuanjit)
Manager, Division of Calibration Laboratory
Responsible for the Technical Management Team

Date of Issue: 17 July 2025

The uncertainties are for a confidence probability of approximately 95 %.

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THAILAND
NSC-TISI-TIS 17025
CALIBRATION 0061

Calibration Report

Certificate No.: 2503897-002-01
Equipment: Water Bath
Model: WB 29 Serial No.: I698.0051
Resolution: 0.1 °C ID No.: N/A
Manufacturer: MEMMERT
Date of Calibration: 14 July 2025

Location: Laboratory, SECOT CO., LTD.
Environment Condition:
Ambient Temperature (31 ± 1) °C
Relative Humidity (61 ± 1) %
Line Voltage (228 ± 3) Volt

Condition of this results of Calibration:

1. This instrument was calibrated by insert 5 standard thermometer into its liquid bath and calibration according to W-TE-011 based on ASTM E715-80 (Re-approved-2016): Standard Specification for Gravity-Convection and Forced-Circulation Water Baths.
   - The temperature scale used is ITS - 90.
   - All data show below were final values and the initial data may be obtained upon request.
2. Reference Standard Instrument :

Instrument	Model	Serial No./ID No.	Certificate No.	Due Date	Through
Digital Thermometer with sensor	34972A	MY57003188	2503175-002	2-Jun-26	NATIONAL FOOD INSTITUTE
	RTD	RTD#301-305 / CH#301-305			

3. This certificate is traceable to International System of Units (SI Units).
4. This certificate was certified only for the instrument we calibrated.
5. This result of calibration was found accurate as shown on date and place of calibration only.
6. Condition of Calibrated item : Good
   UUC Description:
   Time of Record 1 Hour 9 Minute At 95.0 °C
7. Result of Calibration :
   [X] Without adjustment
   [ ] After adjustment

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THAILAND
NSC-TISI-TIS 17025
CALIBRATION 0061

Calibration Report

Certificate No.: 2503897-002-01

Equipment: Water Bath

Model: WB 29 Serial No.: I698.0051

Resolution: 0.1 °C ID No.: N/A

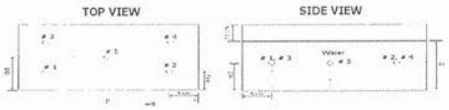
Manufacturer: MEMMERT

Date of Calibration: 14 July 2025

Calibration point: 95.0 °C

Calibration result:

Calibration Condition	Temperature (°C)	Relative Humidity (%)	Line Voltage (Volt)
Min	29.6	62	225.0
Max	32.3	60	230.0



Sensor Installation Location

Table1 : Reporting of Temperature

Calibration Point	Measured Temperature (°C) @ Sensor No. (Sensor No.5 is REF)					Uncertainty
(°C)	# 1	# 2	# 3	# 4	# 5	± (°C)
95.0	95.15	95.11	95.14	94.96	94.99	0.36

Table 2 : Reporting of Characterization Result

UUC* Setting	UUC* Reading (°C)			Stability	Uniformity	Overall Variation
(°C)	MIN	MAX	Average	± (°C)	(°C)	(°C)
95.0	94.9	95.2	95.0	0.21	0.16	0.58

Note The quoted uncertainty include " Stability " and " Loading effect (20% of Temp Uniformity)"

UUC* = Unit Under Calibration

Stability = One-half of the greatest maximum difference of measured temperatures at any one sensors, for at least half an hour after reaching steady state.

Uniformity = The maximum difference of measured temperatures at any sensors and the measured temperature at the reference location which are observed at the same time.

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PerkinElmer
For the Better

PinAAcle 900T
Preventive Maintenance Report

Company Name: Secot.co.th

Instrument Location: Instrument Room

239 Rimkhlong Prapa Rd, Bang Sue, Bangkok 10800

Instrument Serial No.: PTDS23051001

Date: 22 APR 2026

PinAAcle 900T Preventive Maintenance (PM)

Company Name:	Secot.co.th		
Address (Instrument Location):	239 Rimkhlong Prapa Rd, Bang Sue, Bangkok 10800		
Serial Number:	PTDS23051001	**PM Number:**	1/1
Customer Name (if applicable):	K.Araya	**Telephone Number:**	0-2959-3600
Customer Support Engineer Name:	Prasit	**Service Order Number:**	WO-11866808
Date PM Performed: (DD-MMM-YYYY)	22 APR 2026	**Next PM Due Date:** (DD-MMM-YYYY)	22 APR 2027
Standard Labor Hours to Complete PM :		**5 hours**	

Part Number	Release	Publication Date
09370143 Rev.9	A	January 2018

PerkinElmer

Scope
The purpose of this PM is to ensure the continued functionality of the PinAAcle 900T by inspecting and replacing any worn or damaged parts. This service should only be performed by a trained representative of PerkinElmer.
The customer should save their method before the PM begins.

General Instructions:
The customer must provide the engineer operational data to demonstrate recent instrument performance prior to starting the PM. Always check with the customer before making any changes that may affect the customer's analysis or calibration, including a current back-up of system software and/or data files. The completed document should be signed by an authorized PerkinElmer and customer representative and left with the customer. Update the PM sticker and instrument logbook as required.

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Component List

Component / Specific Model	Serial #	Configuration Notes
PinAAcle900T	PTDS23051001	Syngistix V. 5.1.0

Parts Lists

Parts Included with the PM

Part Number (if applicable)	Description	Quantity
B0501696	Fan Filters	N/A
B3002013	THGA Contact Cylinders	N/A
B3141064	Glycerol for THGA Cooling	N/A
N3160156	O-Ring Kits for Sampling Introduction (Stainless Steels Nebulizer)	N/A
N3160157	O-Ring Kits for Sampling Introduction (Plastic Nebulizer)	N/A
N9301714	Replacement Acetylene Filter Cartridge	N/A
TH001022	Replacement Air Filter Cartridge	N/A

Additional Reagents and Standards Required for PM

Part Number (if applicable)	Description	Quality	Batch/Lot #	Expired Date (MM/YY)
N9300183	1000 mg/L Copper Standard	AR	27-156CUY1	SEP-2026
N9300244	GFAAS Mixed Standard	AR		

Additional Reagents and Standards Required for PM (Customer Support Solution)

Part Number (if applicable)	Description	Quantity	Batch/Lot #	Expiration Date (MM/YY)
N/A	DI Water	250 ml.	AR	AR
N/A	0.5% HNO_3	250 ml.	AR	AR

Additional Tools Required for PM			
Part Number (if applicable)	**Description**	**Quantity**	**Serial #**
N1013000	0.2A Neutral density filter	1	MG0-704
N1013002	1.0A Neutral density filter	1	MG2-891
B3100652 Or N9307029	Electronic Flow Meter	1	MY2231FC07
B0505495	Test Jig	1	N/A
03030997	System 2 EDL Driver	1	030309-97E
N3050605	As System 2 EDL	1	17986
N3050121	Cu Lumina HCL	1	000003793D12
N3050109	Ba Lumina HCL	1	041123-010120
N3050139	K Lumina HCL	1	0000037B8E1D
N3050152	Ni Lumina HCL	1	N/A
N3050119	Cr Lumina HCL	1	010324-0300050

Procedure Checklist

Use (✓) to check off those steps in the checklist that have been completed.

1. **General:**

   ☑ Review the instrument performance with the customer and document any recent problems.
   ☑ Inspect the customer log book and make any appropriate PM entries.
   ☑ Perform general inspection of system for cleanliness.

2. **PC Instrument Software:**

   ☑ Instrument Software user files/databases archived, packed, and/or deleted as needed.

3. **Mechanical:**

   ☑ Inspect and clean all fans and filters. Replace filters if necessary
   ☑ Inspect all gas and water lines for leaks and/or wear. Replace if needed. Thoroughly inspect all quick connects. Replace the Y connector, P/N 09921079, if needed.
   ☑ Clean exterior of the instrument.

   3.1 Flame Technique
   ☑ Inspect the burner head, burner chamber, and nebulizer. Clean if needed as stated in the Hardware Guide.
   ☑ Check burner head dimensions with the feeler gauge as stated in the Hardware Guide in the Maintenance chapter section on cleaning the burner head and checking sloth width. Replace if out of specification
   ☑ Check the condition of the end cap, burner head, and nebulizer O-rings. Replace if necessary.
   ☑ Check the drain system for signs of wear. Replace worn or damaged parts.
   ☑ Visually check for proper flame conditions when igniting the Air-C2H2 and N20-C2H2 flames (if applicable).

   3.2 THGA Technique
   ☑ Inspect the pole pieces and clean where the pole pieces contact the furnace. Replace the pole piece p-rings as needed, P/N's B0501018 & B0501250. Grease the O-rings as needed with Apiezon L grease, P/N 09905148
   ☑ Inspect the four insulation pads on the front contact housing of the THGA in furnace. If the pads are missing replace the THGA furnace or replace the insulator pads on the furnace.
   ☑ Inspect the graphite tube and clean the contact cylinders. Replace if necessary.
   ☑ Check internal and external gas flows with the Electronic Gas Flow Meter and the Gas Flow Test Probe as described in the Service Manual. Correct if necessary.
   ☑ Check furnace open/close function.
   ☑ Verify the operation of the GFTV Camera for proper operation and viewing alignment in the furnace camera Tube View window. Align if needed.
   ☑ Check the operation of the Halogen Light ASSY for the GFTV Camera. Replace if needed.
   ☑ Check the water level/quality in the recirculation (if applicable). Add distilled water if necessary.
   ☑ Check the cooling system fluid flow rate with the FCS In-Line Flow Meter for proper levels if needed. Refer to SDB# COSY008.STN

- ☑ Perform Cooling System maintenance if needed per SDB# COSY005.STN.
- ☑ Check auto sampler operation.
- ☑ Perform an auto sampler check valve test as described in the Service Manual.
- ☑ Lubricate the spindles of the auto sampler pumps and all moving parts of the tray mechanics as described in the Service Manual.
- ☑ Inspect the auto sampler sampling capillary as described in the Service Manual. Replace if necessary.

4. Electrical:

- ☑ Inspect PC boards. Clean if necessary.
- ☑ Carefully check all internal and external cable connections.
- ☑ Check instrument firmware revisions upgrade to current levels (if necessary)
- ☑ Run Diagnostics Test within the Advanced function of the Spectrometer page. Check the results in the service log folder in the Spectrometer BM Log Viewer.

5. Optics:

- ☑ Inspect and clean the sample compartment windows, if needed.
- ☑ Inspect and clean the furnace windows, if needed.
- ☑ Inspect and clean the GFTV camera lens, if needed.
- ☑ Inspect optics. Clean or replace if necessary,

6. Gasses:

- ☑ Verify that the Gasses supplied to the instrument are within the pressure and purity specifications found in the PinAAcle 900 Series Pre-installation Checklist SDB.
- ☑ Verify that the air filter element is dry. Replace if necessary.

7. Flame Interlock Check:

Description: Check to ensure that all safety interlocks are closed.

Parameter	Specification	Test Results	Pass/Fail
Flame Sensor	Air/C_2H_2 Flame correctly shuts down	Active	Passed
Drain Sensor	Air/C_2H_2 Flame correctly shuts down	Active	Passed
Nebulizer Sensor	Air/C_2H_2 Flame correctly shuts down	Active	Passed
C_2H_2 Pressure Sensor	Air/C_2H_2 Flame correctly shuts down	Active	Passed
Air Pressure Sensor	Air/C_2H_2 Flame correctly shuts down	Active	Passed
Burner Head Sensor	Choosing Nitrous Oxide as the oxidant should trigger an interlock shuts down	Active	Passed

8. After PM Performance tests [Flame]:

8.1 Detector Linearity with Barium

Description: Ensures that the detector is linear in the Visible Range.

Parameter	Specification	Certificate Value at 553.6 nm (Abs.)	Test Results	Pass/Fail
1.0 A ND Filter	± 5% from Cert.	0.9874	0.9798	Passed
0.2 A ND Filter	± 5% from Cert.	0.1886	0.1893	Passed

8.2 Baseline Noise at 1.0 Absorbance with Barium

Description: Ensures that a high absorbance will not produce excessive noise.

Parameter	Specification	Results	Pass/Fail
Standard Deviation	≤ 0.010	0.0013	Passed

8.3 AA Baseline Noise with Copper

Description: Check baseline noise.

Parameter	Specification	Results	Pass/Fail
Standard Deviation	≤ 0.001	0.0001	Passed

8.4 D_2 Background Compensation with Copper

Description: Verifies the instruments ability to compensate for Background absorption.

Parameter	Specification	Results	Pass/Fail
Standard Deviation	≤ 0.010	0.0046	Passed

8.5 AA-BG Baseline Noise with Copper

Description: Ensures that background correction does not produce excessive noise.

Parameter	Specification	Results	Pass/Fail
Standard Deviation	≤ 0.005	0.0003	Passed

8.6 AA-BG Baseline Noise with Arsenic

Description: Ensures that background correction does not produce excessive noise at a low wavelength.

Parameter	Specification	Results	Pass/Fail
Standard Deviation	≤ 0.005	0.0004	Passed

8.7 Flame Sensitivity

Description: Instrument Sensitivity checked against Copper standard.

Standard Copper Sensitivity	Specification	Results (Abs.)	Pass/Fail
5 mg/L Sensitivity SS Neb (if applicable)	> 0.250 Abs.	N/A	Not Applicable
2 mg/L Sensitivity HS Neb (if applicable)	> 0.250 Abs.	0.3028	Passed

9. After PM Performance tests [THGA]:

9.1 Furnace Gas Flows

Description: Ensures the flow rates are within specification.

Parameter	Specification	Test Results	Pass/Fail
Internal Flow Rate	250 mL/min ± 25 mL/min	252	Passed
External Flow Rate	100 mL/min ± 10 mL/min	97	Passed

9.2 Chromium Baseline Noise

Description: Signal to noise check.

Parameter	Specification	Results	Pass/Fail
Baseline Noise	≤ 0.005 Abs.	0.0019	Passed
Standard Deviation	≤ 0.005	0.0001	Passed

9.3 Chromium Characteristic Mass and Precision

Description: Calculate the characteristic mass using the characteristic mass tool and precision from the integrated absorbance values.

Parameter	Specification	Results	Pass/Fail
Cr m_0 Results	≤ 7.0 pg/0.0044 A-s	6.2	Passed
Precision	≤ 2.0 %	1.29	Passed

9.4 Copper Characteristic Mass and Zeeman Ratio

Description: Calculate the characteristic mass using the characteristic mass tool and check the Zeeman Ratio.

Parameter	Specification	Results	Pass/Fail
Cu m_0 Result	≤ 16.5 pg/0.0044 A-s	8.3	Passed
Zeeman Ratio	0.52 ± 0.04	0.53	Passed

10. Review:

- ☑ Review with the customer PM work performed.
- ☑ Review with the customer routine maintenance procedures.
- ☑ Discuss recommended customer supplied materials to have on hand.
- ☑ Attach PM sticker.

Additional Comments

Additional Comments Regarding the PM
Zeeman Ratio $= \frac{Atomic\ Signal\ (Peak\ area)}{Atomic\ Signal\ (Peak\ area) + Background\ Signal\ (Peak\ area)}$ $= \frac{0.2696}{0.2696+0.2346}$ $= 0.5347$

Review

The preventive maintenance checks and if applicable performance tests for PinAAcle 900T have been completed.

This PinAAcle 900T Passes ☑ Fails ☐ the preventive maintenance.

Review of Preventive Maintenance:

Authorized PerkinElmer Representative:	Prasit	Date: 22 APR 2026 (DD-MMM-YYYY)
Authorized Customer Representative:		Date: 22 APR 2026 (DD-MMM-YYYY)

Additional Comments

Additional Comments Regarding the PM
Zeeman Ratio $= \frac{Atomic\ Signal\ (Peak\ area)}{Atomic\ Signal\ (Peak\ area) + Background\ Signal\ (Peak\ area)}$ $= \frac{0.2696}{0.2696+0.2346}$ $= 0.5347$

Review

The preventive maintenance checks and if applicable performance tests for PinAAcle 900T have been completed.

This PinAAcle 900T Passes ☑ Fails ☐ the preventive maintenance.

Review of Preventive Maintenance:

Authorized PerkinElmer Representative:	Prasit	Date: 22 APR 2026 (DD-MMM-YYYY)
Authorized Customer Representative:	620	Date: 22 APR 2026 (DD-MMM-YYYY)

PinAAcle 900T Preventive Maintenance (PM) Page 9 of 9

7890 B GC FID/μECD

Agilent CrossLab
From Insight to Outcome

Agilent CrossLab Start Up Services

Agilent 7890 Gas Chromatograph

Preventive Maintenance Checklist

Agilent Preventive Maintenance provides factory recommended service for your analytical instruments to assure reliable operation and the accuracy of your results.

Delivered by highly trained and certified service engineers using genuine Agilent parts and supplies, Agilent Preventive Maintenance provides everything you need to reduce unplanned downtime and keep your systems operating at their peak. This checklist will be completed at the end of the service and provided to you as a record of the preventive maintenance activities.

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Introduction

Customer Information

- Customers should provide all necessary operating supplies upon request of the engineer.
- A customer representative should be available to the engineer while performing the preventive maintenance procedures.
- Any parts, not included in the Parts Lists section of this document, are not part of the recommended Preventive Maintenance service, nor are they included in the price of this service.
- If a system requires the use of extra or special procedures and/or parts for the maintenance service, then these must be ordered separately and charged as a repair, which may incur additional costs.

Important Customer Web Links

- For more information about ***Agilent Technologies services***, please visit our website using the following URL: http://www.agilent.com/en-us/products/crosslab-instrument-services/service-repair
- The **Agilent Community** is an excellent place to get answers, collaborate with others about applications and Agilent products, and find in-depth documents and videos relevant to Agilent technologies. Visit https://community.agilent.com/welcome.
- To access **Agilent University**, visit http://www.agilent.com/crosslab/university/ to learn about training options, which include online, classroom and onsite delivery. A training specialist can work directly with you to help determine your best options.
- A useful **Agilent Resource Center** web page is available, which includes short videos on maintenance, quick lists of consumables for new instruments, and other valuable information. Check out the Resource Page here: https://www.agilent.com/en-us/agilentresources.
- Need technical support, FAQs, supplies? – visit our **Support Home page** http://www.agilent.com/search/support.
- **Videos** about specific preparation requirements for your instrument can be found by searching the *Agilent YouTube* **channel at** https://www.youtube.com/user/agilent.
- **7890B Manuals** are also available on Agilent.com:
  - **Safety**
    https://www.agilent.com/cs/library/usermanuals/public/7890B_Safety.pdf
  - **Installation and First Startup**
    https://www.agilent.com/cs/library/usermanuals/Public/7890B_Installation.pdf
  - **Operation Manual**
    https://www.agilent.com/cs/library/usermanuals/Public/7890B_Operation.pdf
  - **Maintaining Your GC**
    https://www.agilent.com/cs/library/usermanuals/public/G3430-90052%207890B_Maintaining%20Guide.pdf

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Service Engineer's Responsibilities

- Contact the customer and ensure that all necessary supplies are available before the preventive maintenance visit.
- Only select those pages that relate to the system or module being serviced.
- Complete empty fields with the relevant information.
- Complete the relevant checkboxes in the checklist using either a "X" or tick mark "✓".
- Check **"Section not applicable"** check boxes to indicate services/tasks not delivered, as appropriate.
- Complete the Preventive Maintenance service in the order of the tasks listed.
- Complete the Service Review section together with the customer.
- Complete the fields for page numbers at the foot of each selected page
- Complete the total number of pages field in the Service Completion section
- ***Ask the customer to sign the Service Completion section including the customer's and your signature.***

Additional Instruction Notes

- Check for any active service notes for this unit. If there are any applicable "Safety" or "Modification Recommended" Service notes, plan to implement the changes on this unit before doing any qualification service.
- Do not implement firmware updates, unless you get approval from the customer and are sure that they are compatible with the instrument control software.

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System Information

☑ Check this box if an instrument configuration report is attached instead of completing the table below.

Instrument System Name and ID	GC7890B / CN15343147
Instrument System Site and Location	SECOT Ltd / Lab

List System Component Product Numbers	**List the Serial Numbers of each Component**
1. G3440B	CN15343147
2. G4513A	CN11350133
3. G4514A	CN1308[illegible]6
4.	
5.	
6.	
7.	
8.	
9.	
10.	

Preparation

- ☑ Discuss any specific issues with the customer before starting.
- ☑ Review the instrument logbook for recorded problems and comments.
- ☑ Save instrument control settings before starting the procedure.
- ☑ Perform a general inspection of the system for cleanliness.
- ☑ Check for proper installation of parts, assemblies, sensors etc.
- ☐ Check system for required installation of components, settings as defined by current Service Notes.
- ☑ Check for required firmware updates and verify with customers if they would like them installed.
- ☑ Before starting the following procedures, record the Detector Signal Output(s) in the results table. If the GC is turned OFF or in a service mode, comparing the detector outputs before and after the service is not possible.

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Preventive Maintenance Procedure

Clean and inspect GC

- ☑ Unplug power cord from the power source.
- ☑ Open GC covers and vacuum/remove any dust/debris. Pay particular attention to cooling fans.
- ☑ Inspect internal connectors for proper contact and placement.
- ☑ Reconnect Power to the GC. Power the GC on and verify the power on self-test passed.
- ☑ Verify oven motor spins freely and turns on with the oven door closed; off when the door is opened.
- ☑ Verify operation of all other fans - the inlet and EPC cooling fans.
- ☑ Verify oven intake/outlet flap assembly is operating smoothly while heating and cooling the oven

Inlet and detector consumable replacement

- ☑ For the inlets installed, perform inlet maintenance as defined in the 7890 manual – "Maintaining Your GC" - for the inlet(s) installed.
- ☑ Replace the split vent trap cartridge filter on units with these inlets: Split/Splitless Capillary (SSL), Multi-Mode Inlet (MMI), Programmed Temperature Vaporizer (PTV), Volatiles Interface (VI).
- ☑ If the inlet system is used in Split Mode with viscous samples, inspect and clean the split vent tube on the inlet and flush or replace the tubing between the inlet and the split vent trap.
- ☑ If the GC includes a Flame Ionization Detector (FID), replace the jet. If the ignitor shows any buildup of sample or corrosion, replace the ignitor. Examine the FID collector and castle assemblies for contamination – clean as necessary.

Zero Sensors and Leak test

- ☑ Zero all pressure sensors per the procedure in the 7890 "Advanced User Guide".
- ☑ Perform inlet pressure decay test(s) as defined in the 7890 "Troubleshooting Manual".
  If the PM is done in preparation for an Operational Qualification, then the pressure decay test defined within that protocol can be used for the PM.
- ☑ Record if test passed or failed in the results table.

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ALS Maintenance

- ☐ **Section NOT applicable**
- ☑ Check all cabling and configuration settings between GC, tray, and injectors.
- ☑ Vacuum or remove any dust, especially around fans.
- ☑ Check operation of all fans.
- ☑ Check syringe for smooth plunger operation.
- ☑ Check for smooth operation of the needle support – clean if necessary

Restore Instrument

- ☑ Restore the normal operating conditions or customer method using the Data System.
- ☑ Purge the system with carrier flow for 15 minutes
- ☑ Bake out the system, then restore the normal operating conditions
- ☑ After equilibration, check and record the post PM detector signal output values.
  Results should be similar or lower than the detector outputs recorded prior to PM.
- ☑ Perform a chemical checkout. If this is a routine PM, inject the customer's sample using the ALS if applicable. This will act as a final checkout of both the ALS and the GC.

Note: If the PM Service is performed prior to a qualification service, then use the qualification procedure as a guide for final instrument set up and checkout.

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Signature Page

Service Review

- ☐ Attach available reports/printouts of all tests to this documentation.
- ☑ Record the Preventive Maintenance service activity in the customer's records/logbook.
- ☑ Update/reset instrument maintenance counters as appropriate.
- ☑ Affix the PM sticker to the system or instrument logbook based on the customer's request.
- ☑ Complete the Service Engineer Comments section if there are additional comments.
- ☑ Review with the customer this service, parts replaced, and test results obtained.
- ☐ If the instrument firmware was updated, record the details of the change in the Service Engineer's Comments box or if necessary, in the customer's IQ records.
- ☐ Supply the customer with a copy of the Smart Alerts flyer.
- ☐ Describe Smart Alerts to the customer.
- ☐ Install Smart Alerts if requested.

7890 GC Test Results Table

Detector Signal Outputs	Before PM Service	After PM Service
Front detector output	N/A	335.2
Back detector output	N/A	15.2
AUX detector output	N/A	N/A
Pressure decay test	**Expected test result**	**Actual test result**
Front inlet pressure decay test	Pass	pass
Back inlet pressure decay test	Pass	pass

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7890 Parts List Table

The following kits are recommended for capillary and purged packed inlets. If this is a general PM and the customer has a preferred set of consumables, you may use the customer's consumables.

Part description	Part number	Product or model# where used	Quantity consumed
SSL Capillary Inlet PM kit, Splitless	5188-6497	7890A/B	N/A
SSL Capillary Inlet PM kit, split	5188-6496	7890A/B	2
SSL Capillary Ultra Inert Inlet Gold Seal with Washer	5190-6144	7890A/B	N/A
SSL Capillary Ultra Inert Inlet Splitless Liner - Single taper with Glass Wool	5190-2293	7890A/B	N/A
SSL Capillary Ultra Inert Inlet Low Pressure Drop Split Liner - with Glass Wool	5190-2295	7890A/B	N/A
PP Inlet PM kit	5188-6498	7890A/B	N/A
Split vent trap PM kit, single cartridge (for MMI, PTV & VI)	5188-6495	7890A/B	N/A
MMI Cleaning Kit	G3510-60820	7890A/B	N/A
PTV Septumless Head Rebuild Kit	5182-9747	7890A/B	N/A
PTV Septumless Head Teflon Guide	5182-9748	7890A/B	N/A
Ignitor (glow plug) assembly with O-ring	19231-60680	7890A/B	1
FID Collector Rebuild/Cleaning Kit	G1531-67000	7890A/B	N/A
Standard .011-inch FID Jet for capillary FID base	G1531-80560	7890A/B	1
High Temperature .018-inch FID Jet for capillary FID base	G1531-80620	7890A/B	N/A
Standard .018-inch FID Jet for packed column with packed FID base	18710-20119	7890A/B	N/A
Standard .011-inch FID Jet for capillary column with packed/adaptable FID base	19244-80560	7890A/B	N/A
High Temperature .018-inch FID Jet for capillary column with packed/adaptable FID base	19244-80620	7890A/B	N/A
NPD Jet, universal fit, .011-inch ID	G1534-80580	7890A/B	N/A
NPD Jet, universal fit, .011-inch ID Extended tip	G1534-80590	7890A/B	N/A
SSL Capillary Ultra Inert Inlet Gold Seal with Washer	5190-6144	7890A/B	N/A
SSL Capillary Ultra Inert Inlet Splitless Liner - Single taper with Glass Wool	5190-2293	7890A/B	N/A
**FID Collector Replacement Kit, if needed	G1531-67001	7890A/B	N/A

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Service Engineer Comments

If there are any specific points you wish to note as part of performing the service or other items of interest for the customer, please write include them in this box.

Service Completion

Service request number 6008977823 Date service completed 27 April 2026

Agilent signature [signature] Customer signature [signature]

Total number of pages in this document 6 pages

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7890 / ATOM 1104

Agilent CrossLab
From Insight to Outcome

Agilent CrossLab Start Up Services

Agilent 7890 Gas Chromatograph Preventive Maintenance Checklist

Agilent Preventive Maintenance provides factory recommended service for your analytical instruments to assure reliable operation and the accuracy of your results.

Delivered by highly trained and certified service engineers using genuine Agilent parts and supplies, Agilent Preventive Maintenance provides everything you need to reduce unplanned downtime and keep your systems operating at their peak. This checklist will be completed at the end of the service and provided to you as a record of the preventive maintenance activities.

Agilent

Introduction

Customer Information

- Customers should provide all necessary operating supplies upon request of the engineer.
- A customer representative should be available to the engineer while performing the preventive maintenance procedures.
- Any parts, not included in the Parts Lists section of this document, are not part of the recommended Preventive Maintenance service, nor are they included in the price of this service.
- If a system requires the use of extra or special procedures and/or parts for the maintenance service, then these must be ordered separately and charged as a repair, which may incur additional costs.

Important Customer Web Links

- For more information about ***Agilent Technologies services***, please visit our website using the following URL: http://www.agilent.com/en-us/products/crosslab-instrument-services/service-repair
- The **Agilent Community** is an excellent place to get answers, collaborate with others about applications and Agilent products, and find in-depth documents and videos relevant to Agilent technologies. Visit https://community.agilent.com/welcome.
- To access **Agilent University**, visit http://www.agilent.com/crosslab/university/ to learn about training options, which include online, classroom and onsite delivery. A training specialist can work directly with you to help determine your best options.
- A useful **Agilent Resource Center** web page is available, which includes short videos on maintenance, quick lists of consumables for new instruments, and other valuable information. Check out the Resource Page here: https://www.agilent.com/en-us/agilentresources.
- Need technical support, FAQs, supplies? – visit our **Support Home page** http://www.agilent.com/search/support.
- **Videos** about specific preparation requirements for your instrument can be found by searching the *Agilent YouTube* **channel at** https://www.youtube.com/user/agilent.
- **7890B Manuals** are also available on Agilent.com:
  - **Safety**
    https://www.agilent.com/cs/library/usermanuals/public/7890B_Safety.pdf
  - **Installation and First Startup**
    https://www.agilent.com/cs/library/usermanuals/Public/7890B_Installation.pdf
  - **Operation Manual**
    https://www.agilent.com/cs/library/usermanuals/Public/7890B_Operation.pdf
  - **Maintaining Your GC**
    https://www.agilent.com/cs/library/usermanuals/public/G3430-90052%207890B_Maintaining%20Guide.pdf

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Agilent 7890 GC Preventive Maintenance Checklist

Service Engineer's Responsibilities

- Contact the customer and ensure that all necessary supplies are available before the preventive maintenance visit.
- Only select those pages that relate to the system or module being serviced.
- Complete empty fields with the relevant information.
- Complete the relevant checkboxes in the checklist using either a "X" or tick mark "✓".
- Check **"Section not applicable"** check boxes to indicate services/tasks not delivered, as appropriate.
- Complete the Preventive Maintenance service in the order of the tasks listed.
- Complete the Service Review section together with the customer.
- Complete the fields for page numbers at the foot of each selected page
- Complete the total number of pages field in the Service Completion section
- ***Ask the customer to sign the Service Completion section including the customer's and your signature.***

Additional Instruction Notes

- Check for any active service notes for this unit. If there are any applicable "Safety" or "Modification Recommended" Service notes, plan to implement the changes on this unit before doing any qualification service.
- Do not implement firmware updates, unless you get approval from the customer and are sure that they are compatible with the instrument control software.

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System Information

☐ Check this box if an instrument configuration report is attached instead of completing the table below.

Instrument System Name and ID	GCMS
Instrument System Site and Location	SECOT Co Ltd

List System Component Product Numbers	List the Serial Numbers of each Component
1. G3442A	CN13201053
2. G4513A	CN13360196
3. G4514A	CN13230031
4.	
5.	
6.	
7.	
8.	
9.	
10.	

Preparation

- ☑ Discuss any specific issues with the customer before starting.
- ☑ Review the instrument logbook for recorded problems and comments.
- ☑ Save instrument control settings before starting the procedure.
- ☑ Perform a general inspection of the system for cleanliness.
- ☑ Check for proper installation of parts, assemblies, sensors etc.
- ☑ Check system for required installation of components, settings as defined by current Service Notes.
- ☑ Check for required firmware updates and verify with customers if they would like them installed.
- ☑ Before starting the following procedures, record the Detector Signal Output(s) in the results table. If the GC is turned OFF or in a service mode, comparing the detector outputs before and after the service is not possible.

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Agilent 7890 GC Preventive Maintenance Checklist

Preventive Maintenance Procedure

Clean and inspect GC

- ☑ Unplug power cord from the power source.
- ☑ Open GC covers and vacuum/remove any dust/debris. Pay particular attention to cooling fans.
- ☑ Inspect internal connectors for proper contact and placement.
- ☑ Reconnect Power to the GC. Power the GC on and verify the power on self-test passed.
- ☑ Verify oven motor spins freely and turns on with the oven door closed; off when the door is opened.
- ☑ Verify operation of all other fans - the inlet and EPC cooling fans.
- ☑ Verify oven intake/outlet flap assembly is operating smoothly while heating and cooling the oven

Inlet and detector consumable replacement

- ☑ For the inlets installed, perform inlet maintenance as defined in the 7890 manual – "Maintaining Your GC" - for the inlet(s) installed.
- ☑ Replace the split vent trap cartridge filter on units with these inlets: Split/Splitless Capillary (SSL), Multi-Mode Inlet (MMI), Programmed Temperature Vaporizer (PTV), Volatiles Interface (VI).
- ☑ If the inlet system is used in Split Mode with viscous samples, inspect and clean the split vent tube on the inlet and flush or replace the tubing between the inlet and the split vent trap.
- ☐ If the GC includes a Flame Ionization Detector (FID), replace the jet. If the ignitor shows any buildup of sample or corrosion, replace the ignitor. Examine the FID collector and castle assemblies for contamination – clean as necessary.

Zero Sensors and Leak test

- ☑ Zero all pressure sensors per the procedure in the 7890 "Advanced User Guide".
- ☑ Perform inlet pressure decay test(s) as defined in the 7890 "Troubleshooting Manual".
  If the PM is done in preparation for an Operational Qualification, then the pressure decay test defined within that protocol can be used for the PM.
- ☑ Record if test passed or failed in the results table.

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ALS Maintenance

- ☐ **Section NOT applicable**
- ☑ Check all cabling and configuration settings between GC, tray, and injectors.
- ☑ Vacuum or remove any dust, especially around fans.
- ☑ Check operation of all fans.
- ☑ Check syringe for smooth plunger operation.
- ☑ Check for smooth operation of the needle support – clean if necessary

Restore Instrument

- ☑ Restore the normal operating conditions or customer method using the Browser interface or Data System.
- ☑ Purge the system with carrier flow for 15 minutes
- ☑ Bake out the system, then restore the normal operating conditions
- ☑ After equilibration, check and record the post PM detector signal output values.
  Results should be similar or lower than the detector outputs recorded prior to PM.
- ☐ Perform a chemical checkout. If this is a routine PM, inject the customer's sample using the ALS if applicable. This will act as a final checkout of both the ALS and the GC.

Note: If the PM Service is performed prior to a qualification service, then use the qualification procedure as a guide for final instrument set up and checkout.

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Agilent 7890 GC Preventive Maintenance Checklist

Signature Page

Service Review

- ☑ Attach available reports/printouts of all tests to this documentation.
- ☑ Record the Preventive Maintenance service activity in the customer's records/logbook.
- ☑ Update/reset instrument maintenance counters as appropriate.
- ☑ Affix the PM sticker to the system or instrument logbook based on the customer's request.
- ☑ Complete the Service Engineer Comments section if there are additional comments.
- ☑ Review with the customer this service, parts replaced, and test results obtained.
- ☐ If the instrument firmware was updated, record the details of the change in the Service Engineer's Comments box or if necessary, in the customer's IQ records.
- ☐ Supply the customer with a copy of the Smart Alerts flyer.
- ☐ Describe Smart Alerts to the customer.
- ☐ Install Smart Alerts if requested.

7890 GC Test Results Table

Detector Signal Outputs	Before PM Service	After PM Service
Front detector output	N/A	N/A
Back detector output	N/A	N/A
AUX detector output	N/A	N/A
Pressure decay test	**Expected test result**	**Actual test result**
Front inlet pressure decay test	Pass	Pass
Back inlet pressure decay test	Pass	N/A

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7890 Parts List Table

The following kits are recommended for capillary and purged packed inlets. If this is a general PM and the customer has a preferred set of consumables, you may use the customer's consumables.

Part description	Part number	Product or model# where used	Quantity consumed
SSL Capillary Inlet PM kit, Splitless	5188-6497	7890A/B	N/A
SSL Capillary Inlet PM kit, split	5188-6496	7890A/B	1
SSL Capillary Ultra Inert Inlet Gold Seal with Washer	5190-6144	7890A/B	N/A
SSL Capillary Ultra Inert Inlet Splitless Liner - Single taper with Glass Wool	5190-2293	7890A/B	N/A
SSL Capillary Ultra Inert Inlet Low Pressure Drop Split Liner - with Glass Wool	5190-2295	7890A/B	N/A
PP Inlet PM kit	5188-6498	7890A/B	N/A
Split vent trap PM kit, single cartridge (for MMI, PTV & VI)	5188-6495	7890A/B	N/A
MMI Cleaning Kit	G3510-60820	7890A/B	N/A
PTV Septumless Head Rebuild Kit	5182-9747	7890A/B	N/A
PTV Septumless Head Teflon Guide	5182-9748	7890A/B	N/A
Ignitor (glow plug) assembly with O-ring	19231-60680	7890A/B	N/A
FID Collector Rebuild/Cleaning Kit	G1531-67000	7890A/B	N/A
Standard .011-inch FID Jet for capillary FID base	G1531-80560	7890A/B	N/A
High Temperature .018-inch FID Jet for capillary FID base	G1531-80620	7890A/B	N/A
Standard .018-inch FID Jet for packed column with packed FID base	18710-20119	7890A/B	N/A
Standard .011-inch FID Jet for capillary column with packed/adaptable FID base	19244-80560	7890A/B	N/A
High Temperature .018-inch FID Jet for capillary column with packed/adaptable FID base	19244-80620	7890A/B	N/A
NPD Jet, universal fit, .011-inch ID	G1534-80580	7890A/B	N/A
NPD Jet, universal fit, .011-inch ID Extended tip	G1534-80590	7890A/B	N/A
SSL Capillary Ultra Inert Inlet Gold Seal with Washer	5190-6144	7890A/B	N/A
SSL Capillary Ultra Inert Inlet Splitless Liner - Single taper with Glass Wool	5190-2293	7890A/B	N/A
**FID Collector Replacement Kit, if needed	G1531-67001	7890A/B	N/A

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Agilent 7890 GC Preventive Maintenance Checklist

Service Engineer Comments

If there are any specific points you wish to note as part of performing the service or other items of interest for the customer, please write include them in this box.

Service Completion

Service request number 6008100914 Date service completed 13 Feb 2026

Agilent signature [signature] Customer signature Jutarat T.

Total number of pages in this document _____

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Agilent Preventive Maintenance Services

Agilent GCMS Preventive Maintenance

Agilent Preventive Maintenance provides factory recommended service for your analytical instruments to assure reliable operation and the accuracy of your results

Delivered by highly trained and certified service engineers using genuine Agilent parts and supplies, Agilent Preventive Maintenance provides what you need to reduce unplanned downtime and keep your systems operating at their peak performance.

This checklist is used as a guide for completing the preventive maintenance tasks. A signed copy of this checklist is provided for your records.

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Introduction

This checklist covers the following model(s):

Type	Model
SQ	5973 Series MSD
SQ	5975 Series MSD
SQ	5977 Series MSD
TQ	7000 Series MS/MS
TQ	7010 Series MS/MS
QTOF	7200 Series QTOF
QTOF	7250 Series QTOF

Customer Information

- Customers should provide all necessary operating supplies upon request of the engineer.
- A customer representative should be available to the engineer while performing the preventive maintenance procedures. Customers are responsible for regular maintenance and are encouraged to observe the service representative.
- Any parts not included in the Parts Lists section of this document are not part of the recommended Preventive Maintenance service nor are they included in the price of this service.
- If a system requires the use of extra or special procedures and/or parts for the maintenance service, then these must be ordered separately and charged as a repair, which may incur additional costs.

Customer Responsibilities

Customers should ensure that all necessary operating supplies, consumables, and usage-dependent items such as gases, vials, syringes, calibrant solution and solvents required for successful preventive maintenance are available. A customer representative should be available while the preventive maintenance is being performed.

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Important notice for customers

The customer should complete the following before the Support Provider arrives on site:

- ❑ Perform an autotune and retain the printed tune report just prior to the start of the PM to verify performance of the equipment.

  Note: it is recommended to have the customer run the autotune and tune evaluation prior to the PM and then start the vent cycle so that the instrument will be ready for the service representative.

Important Customer Web Links

- To access Agilent training and education, visit http://www.agilent.com/chem/training to learn about training options, which include online, classroom and onsite delivery. A training specialist can work directly with you to help determine your best options.
- To access the **Agilent Resource Center** web page, visit https://www.agilent.com/en-us/agilentresources. The following information topics are available:
  - Sample Prep and Containment
  - Chemical Standards
  - Analysis
  - Service and Support
  - Application Workflows
- The **Agilent Community** is an excellent place to get answers, collaborate with others about applications and Agilent products, and find in-depth documents and videos relevant to Agilent technologies. Visit https://community.agilent.com/welcome
- Videos about specific preparation requirements for your instrument can be found by searching the **Agilent YouTube** channel at https://www.youtube.com/user/agilent
- **Need to place a service call?** Flexible Repair Options | Agilent

Service Engineer's Responsibilities

- Contact the customer and ensure that all necessary supplies are available before the preventive maintenance visit.
- Only select those pages that relate to the system or module being serviced.
- Complete empty fields with the relevant information.

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- Complete the relevant checkboxes in the checklist using either a "**X**" or tick mark "✓".
- Check **"Service not applicable"** check boxes to indicate services/tasks not delivered, as appropriate.
- Complete the Preventive Maintenance services in order by sections: Review, System Checks, Pump maintenance, Cleaning System and Filters, then System Post Check.
  - The tasks in each section may be completed in the most logical order relevant to the system. Complete the **Service Review** section together with the customer.
- Complete the fields for page numbers at the foot of each selected page
- Add relevant page numbers to selected pages and complete the total number of pages field in the Service Verification section
- Complete Signature Page and attach Signature Page to Service Order.

Additional Instruction Notes

- Preventive maintenance is a factory recommended procedure designed to reduce the likelihood of electromechanical failures. Failure to perform preventive maintenance may reduce the long-term reliability of certain instruments and systems. Two preventative maintenances (PMs) per year are recommended, the Major PM Service will be performed annually with an Interim PM performed 6 months after the Major PM.

Definition of the Task/Recommended items within the document

Task		Recommended			
Yes	No	Interim	Major	As Needed	
✓					Yes selected means that the task was done or the part was required
	✓				No selected means that the task was not done or the part was not required.
		✓			Interim selected means that this task is recommended to be done at 6-month intervals
			✓		Major selected means that this task is recommended to be done yearly; if the customer would like a service to be done at the 6-month interval then the service could be purchased
				✓	As needed selected means that the task was done, or the part was used as needed. For example, there could be two types of filters that could be used, and this was the one selected.

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Instrument Maintenance

Select the appropriate service to be performed.

- ☐ Interim Preventive Maintenance (when available, is typically 6 months or at the request of the customer)
- ☑ Major Preventive Maintenance (Yearly)
- ☐ Enhanced Preventive Maintenance (when available, is provided "As needed")

System Information

☐ Check this box if an instrument configuration report is attached instead of completing the table.

Instrument System Name and ID	GCMS
Instrument System Site and Location	SECOT Co Ltd

List System Component Product Numbers	List the Serial Numbers of each Component
1. G3172A	US13343B01
2.	
3.	
4.	
5.	
6.	

Preparation

- ☑ Discuss any specific issues with the customer before starting.
- ☑ Review the instrument logbook for recorded problems and comments.
- ☑ Save instrument control settings before starting the procedure.
- ☑ Perform a general inspection of the system for cleanliness.
- ☑ Check for proper installation of parts, assemblies, sensors etc.
- ☑ Check system for required installation of components and implementation of Service Notes
- ☑ Check firmware version(s). Updating to the most current versions is strongly recommended. Verify with the customer before updating.

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Preventive Maintenance Procedures

☐ **Service Not Applicable**

Interim / Major Preventive Maintenance – GCMS

Yes/No		Interim/Major		Description
☑	☐	☑	☑	Perform general inspection of system for cleanliness
☑	☐	☑	☑	Discuss any problems the customer is having with the instrument
☑	☐	☑	☑	Review customer maintenance records and exclude maintenance on recently serviced items
☑	☐	☑	☑	Review the most recent autotune report. This will give a starting point for evaluating spectral peaks, baseline noise, peak shape, mass assignments and resolution.

Interim / Major Preventive Maintenance – System Checks

☐ **Service Not Applicable**

				System Checks
Yes/No		Interim/Major		Description
☑	☐	☑	☑	Verify that calibration peaks were seen prior to starting the PM
☑	☐	☑	☑	Vent the instrument
☑	☐	☑	☑	Inspect vacuum hoses, pump, exhaust tubing, and power cords for excessive wear.
☑	☐	☑	☑	Visually inspect calibrant levels – PFTBA PFDTD (if appl.), IRM (if appl.). Refill if available.
☑	☐	☑	☑	Look for any obvious external damage or problems.
☑	☐	☑	☑	Clean air intake(s). Cosmetic cover(s) may need to be removed.
☑	☐	☑	☑	Verify system line voltage meets instrument specifications: **Yes** ☑ **No** ☐
☐	☑	☑	☑	For HydroInert systems, verify customer is running hydrogen: **Yes** ☐ **No** ☐

Interim / Major Preventive Maintenance – Wet Mechanical vacuum pumps

☐ **Service Not Applicable**

Yes/No	☐	☐		Wet Mechanical vacuum pumps
Yes/No		Interim/Major		Description
☑	☐	☑	☑	Check for evidence of oil leakage. Check pump gasket for leakage.
☑	☐	☐	☑	GC/MS SQ with diffusion pump; drain and replace diffusion pump oil.
☑	☐	☑	☑	Drain and replace mechanical pump oil.
☐	☑	☑	☑	Replace Oil Mist Filter if applicable.

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Yes/No ☐ ☐				Wet Mechanical vacuum pumps	
☑	☐	☑	☑		Discuss with customer the need for more frequent oil changes if the oil is dirty
☑	☐	☑	☑		Don't use mist filters with Chemical Ionization.
☑	☐	☑	☑	Perform anti-suckback valve test. Power on until side plate is held closed, power off and check that side plate holds closed. Visually confirm that no oil returns up vacuum hose.	

Interim / Major Preventive Maintenance – Dry Mechanical vacuum pumps - Diaphragm

☑ **Service Not Applicable**

Yes/No ☐ ☐				Dry Mechanical vacuum pumps - Diaphragm
Yes/No		Interim/Major		Description
☐	☐	☑	☑	Check for evidence of poor vacuum – Turbo power demand, poor manifold vacuum, etc.
☐	☐	☑	☑	Clear air flow paths of dust.
☐	☐	☑	☑	If vacuum is poor, then replace the diaphragm pump.
☐	☐	☑	☑	Perform anti-suckback valve test. Power on until side plate is held closed, power off and check that side plate holds closed.

Interim / Major Preventive Maintenance – Dry Mechanical vacuum pumps - Scroll

☑ **Service Not Applicable**

Yes/No ☐ ☐				Dry Mechanical vacuum pumps - Scroll	
Yes/No		Interim/Major		Description	
☐	☐	☑	☑	Replace the tips seal on the IDP pump.	
☐	☐	☑	☑	Check for evidence of poor vacuum – Rough vac pressure, turbo power demand, poor manifold vacuum, etc.	
☐	☐	☑	☑	Replace the Exhaust Filter if required.	
☐	☐	☑	☑		Discuss with customer the need for more frequent changes, if needed.
☐	☐	☑	☑		Inform customer that pump gas ballast should be installed all the time.
☐	☐	☑	☑	Perform anti-suckback valve test. Power on until side plate is held closed, power off and check that side plate holds closed.	

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Agilent GCMS Preventive Maintenance Checklist

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Interim / Major Preventive Maintenance – Cleaning System and Filters

☐ **Service Not Applicable**

				Cleaning System and Filters	
Yes/No		Interim/Major		Description	
				Fans	
☑	☐	☑	☑		Remove dust from fans and vent covers.
☑	☐	☑	☑		Verify fans are functional and that there is enough space around the instrument for proper cooling.
				Source cleaning (all sources except HydroInert)	
☑	☐	☐	☑		Open analyzer and remove the source.
☑	☐	☐	☑		Disassemble, Clean, Re-assemble source. (7200, also, remove and clean entrance lens)
☑	☐	☐	☑		Re-install source and close analyzer.
				HydroInert Source	
☐	☑	☐	☐		Source NOT to be abrasively cleaned. No cleaning required at PM. If a decrease in performance is observed, recommend to the customer that filaments, insulators (repeller and extractor), extractor lens, and repeller lens may need to be replaced to restore performance. HydroInert source should not be run with helium carrier.
				Filters	
☑	☐	☐	☑		Replace RMSH-2 Helium gas filter (collision cell gas) – if applicable.
☐	☑	☐	☑		Replace RMSN-2 Nitrogen gas filter (collision cell gas) – if applicable.
☐	☑	☐	☑		Replace RMSHY-2 Hydrogen gas filter (HydroInert and JetClean) – if applicable.
☐	☑	☐	☑		CP17973 – Gas Clean GS/MS Filter (for He, N2 or H2 carrier) – if required
☐	☑	☐	☑		5190-9071 – Methane Gas Filter (CI systems) – if applicable

Guidance: Gas filters need to be changed only if required (ie indicating traps show color change, or if Big Universal Trap are approaching saturation based on time installed or number of gas cylinders changed for that trap)

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Interim / Major Preventive Maintenance – System Post Check

☐ **Service Not Applicable**

				System post-check	
Yes/No		Interim/Major		Description	
☑	☐	☑	☑	Pump system back down. Wait until system stability has been achieved.	
☑	☐	☑	☑	Verify system vacuum reading(s) via the gauge controller.	
☑	☐	☑	☑	Leak Check	
☑	☐	☑	☑		Verify system in manual tune
☑	☐	☑	☑		Compare against previous tune file report(s)
☑	☐	☑	☑	Change to Tune and verify that all temperatures, pressures, and gas flows reach method set points	
☑	☐	☑	☑	Check manually that you have calibration peaks.	
☑	☐	☑	☑	EI Autotune Performed	

Guidance: If the PM Service is performed prior to a qualification service, then use the qualification procedure as a guide for final instrument setup and checkout.

Service Review

- ☑ Attach available reports/printouts of all tests to this documentation.
- ☑ Record the Preventive Maintenance service activity in the customer's records/logbook.
- ☑ Record the PM event in the Smart Alerts logbook, if applicable.
- ☑ Update/reset instrument maintenance counters as appropriate.
- ☑ Affix the PM sticker to the system or instrument logbook based on the customer's request.
- ☑ Complete the Service Engineer Comments section if there are additional comments.
- ☑ Review this service, parts replaced, and test results obtained with the customer.
- ☑ If the instrument firmware was updated, record the details of the change in the Service Engineer's Comments box. Systems in a compliant environment may need additional documentation.
- ☑ Complete Signature Page and attach Signature Page to Service Order.

Test Results

Test Description	Expected Test Result	Actual Test Result

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Signature Page

Service Engineer Comments (optional)

If there are any specific points you wish to note as part of performing the service review or other items of interest for the customer, please write in this box.

Service Verification

Service Request Number:

6008100914

Date of Service Completion:

13 Feb 2026

Service Engineer Name:

Supasak N.

Customer Name:

Jutarat J.

Service Engineer Signature:

Total number of pages in this document:

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Parts for consumption during PM

Common Oil and MS Gas Filters – 5973/5975/5977/7000/7010/7200/7250 Series

Part Description	Part Number	Interim	Major	As Needed
Agilent AVF Platinum, 1 quart	5191-5851	✓	✓	✓
Helium gas filter* (collision cell gas) – if required	RMSH-2		✓	✓
Nitrogen gas filter*(collision cell gas) – if required	RMSN-2		✓	✓
Hydrogen gas filter* ^ (HydroInert and JetClean) – if required	RMSHY-2		✓	✓
Chemical Ionization Gas Purifier (CI systems) (Methane) – if required	5190-9071		✓	✓
Gas Clean GS/MS Filter (for He, N2 or H2) – if required	CP17973		✓	✓
# Gas Clean Filter Kit GC/MS 1/8 in (complete replacement kit - bench mounted) – if required	CP17974			✓
# Gas Clean Carrier Gas Kit for 7890 for He, N2 or H2; Bracket, Mount and Filter – if required	CP17988			✓
# Gas Clean Carrier Gas Kit for 8890 & 8860 for He, N2 or H2; Bracket, Mount and Filter – if required	CP179880			✓

Gas filters need to be changed only if required (ie indicating traps show color change, or if Big Universal Trap are approaching saturation based on time installed or number of gas cylinders changed for that trap)

* Big Universal Trap (BUT), 1/8" fittings
^ HydroInert and JetClean Systems
# Alternate Gas Clean kit part numbers. A Gas Clean filter is included in the kits. They are only necessary if replacing carrier gas Big Universal Traps with indicating traps

MS Maintenance Supplies for 5973/5975/5977 Series

Part Description	Part Number	Interim	Major	As Needed
Diffusion pump fluid (Diffusion Pump Models)	6040-0809 Qty 2		✓	✓
Exhaust oil mist trap (threaded) Edwards/Pfeiffer	G1099-80039	✓	✓	✓
DS42 Oil Mist Eliminator 3/4G & 3/8	SR03706556	✓	✓	✓
IDP-3 Tip Seal Replacement Kit (IDP-3 Dry Scroll Pump Models – Includes tip seal, 60mm filter element, tools, mask and cleaning supplies)	G7077-67018	✓	✓	✓
IDP-3 Tip Seal Replacement Kit (no tools – CSD P/N)	5190-9561	✓	✓	✓
IDP-3 Tip Seal Replacement Kit (no tools – VPD P/N)	IDP3TS	✓	✓	✓
Filter element for IDP-3 (diameter: 60mm)	REPLSLRFILTER2	✓	✓	✓

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MS Maintenance Supplies for 7000/7010 Series

Part Description	Part Number	Interim	Major	As Needed
Oil Mist Filter RV5	G6600-80043	✓	✓	✓
IDP-10 Tip Seal Replacement Kit (IDP-10 Dry Scroll Pump Models – Includes tip seal, 102mm filter element, tools, mask and cleaning supplies)	G7004-67023	✓	✓	✓
IDP-10 Tip Seal Replacement Kit (no tools etc. – VPD P/N)	X3807-67000	✓	✓	✓
Filter element for IDP-10/IDP15 (diameter: 102mm)	REPLSLRFILTER	✓	✓	✓
Filter element for IDP-10/IDP15 (diameter: 79mm)	REPLSLRFILTER1	✓	✓	✓

MS Maintenance Supplies for 7200/7250 Series

Part Description	Part Number	Interim	Major	As Needed
RIS Probe Maintenance Kit (7200 Series only)	G7005-60170		✓	✓
DS202 Oil Mist Eliminator	SR03706800	✓	✓	✓
DS202 3/8' Magnetic Plug and Gasket	SR03701824	✓	✓	✓
IDP-15 Tip Seal Replacement Kit (IDP-15 Dry Scroll Pump Models – Includes tip seal, 102mm filter element, tools, mask and cleaning supplies)	5190-9613	✓	✓	✓
IDP-15 Tip Seal Replacement Kit (no tools etc.– VPD P/N)	X3815-67000	✓	✓	✓
Filter element for IDP-10/IDP15 (diameter: 102mm)	REPLSLRFILTER	✓	✓	✓
Filter element for IDP-10/IDP15 (diameter: 79mm)	REPLSLRFILTER1	✓	✓	✓

HydroInert Source Supplies

To determine if replacement of HydroInert parts is required, please review tune history and sample signal intensity performance. If performance is decreasing, the below parts maybe use to restore performance as part of the PM.

One way to determine if the source performance on SQ is being affected is to review the gain factor history in autotune reports or tune history csv file. If the gain factor is increasing the source performance maybe degrading.

Since TQ tunes to a fixed gain factor, review PFTBA abundance. If PFTBA abundance is decreasing over time, the source performance maybe degrading.

Real sample/standard area counts are another way to determine the performance, there could also be other factors that affect compounds abundance such as inlet and column status.

Part Description	Part Number	Interim	Major	As Needed
Repeller Insulator (qty 2)	G1099-20133			✓
Lens insulator for Extractor (ring insulator)	G3870-20445			✓
HydroInert Extractor lens (9mm)	G7078-20909			✓
HydroInert Repeller	G7078-20902			✓

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Common Parts Reference
(Purchased by customer, not included as part of PM)

Filaments and Calibrant Supplies 5973/5975/5977/7000/7010/7200/7250 Series

Part Description	Part Number	SQ	TQ	QTOF
EI High Temperature Filaments	G7005-60061 Qty 2	597X	7000x	N/A
HES, HES 2.0 EI Filaments	G7002-60001	5977B/C	7010x	N/A
HES 2.0 EI Filament Spacer	G7007-20023	N/A	7010x	N/A
LE-EI Filaments (7250 QTOF)	G3850-60021	N/A	N/A	7250
CI High Temperature Filament – SQ, TQ, 7200 QTOF	G7005-60072	N/A	N/A	7200A/B
Axial CI Filament, W/Re Straight (7250 QTOF)	G7250-60095	N/A	N/A	7250
PFTBA GCMS Tuning Standard calibrant	05971-60571	597X	70X0	72X0
PFDTD calibrant, 1 mL	8500-8510	597X	70X0	72X0
PFET, IRM calibrant for GC QTOF 0.5 mL (7200)	5190-0531	N/A	N/A	7200A/B

Transfer line seals and springs 5973/5975/5977/7000/7010/7200/7250 Series

Part Description	Part Number	SQ	TQ	QTOF
CI Interface tip seal (ceramic tip and spring combo) (non-captured CI tip seal interface) (5973, 5975, 7000B)	G1999-60412	5973, 5975	7000B	N/A
CI Interface tip seal (ceramic tip and spring low/non-magnetic spring combo) (non-captured CI tip seal interface) (7010A)	G7002-60412	N/A	7010A	N/A
CI Interface tip seal spring (spring only)	G1999-20023	597X	70X0	72X0
CI Interface tip seal (tip only) (captured style)	G3870-20542	5977x	70X0	72X0
Transfer-Line Tip Base, Threaded (captured style)	G3870-20548	5977x	70X0	72X0
Transfer-Line Tip Cap, Threaded (captured style)	G3870-20547	5977x	70X0	72X0
RIS Xfer Tip (7200)	G7005-20542	N/A	N/A	7200A/B
RIS Xfer Tip Spring (7200)	G7005-20024	N/A	N/A	7200A/B

MS Maintenance Supplies for Intuvo 9000 MS Series

Part Description	Part Number	SQ	TQ	QTOF
Swaged MS Tail - Packaged	G4590-60009	5977x	7000	N/A
Swaged MS Tail (HES, HES 2.0) - Packaged	G4590-60109	5977x	7010x	N/A

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Ion source insulators for 5973/5975/5977/7000/7010/7200/7250 Series

Part Description	Part Number	SQ	TQ	QTOF
Repeller insulator (SQ, TQ)	G1099-20133 Qty 2	597X	7000x	N/A
Lens insulator for extractor lens (ceramic ring insulator) (Extractor source)	G3870-20445	5977x	7000C/D/E	N/A
Lens insulator for Extractor lens (Vespel ring insulator) (7000B extractor ion source)	G7000-20445	N/A	7000B only	N/A
Lens stack insulator for SS, Inert, Extractor sources (captures ion focus and entrance lens) (Vespel)	G3170-20530	597X	7000x	N/A
Lens insulator for Extractor lens for HES/HES 2.0/LEEI (ceramic ring insulator)	G7002-20064	5977B/C	7010x	7250
Lens stack insulator/holder for HES/LLEI (Vespel)	G7002-20074	5977B/C	7010x	7250
Lens stack insulator/holder for HES 2.0 (Vespel)	G7007-20074	N/A	7010x	N/A
CI Repeller Lens Insulator (SQ, TQ)	G1999-20433	597X	70X0x	N/A
CI Lens stack insulator (SQ, TQ) (Vespel)	G3170-20540	597X	70X0x	N/A
Repeller insulator (7200 RIS) (Ceramic)	G7005-20447	N/A	N/A	7200A/B
Extractor Lens Insulator (7200 RIS) (Vespel)	G7005-20133	N/A	N/A	7200A/B
Ion Focus Insulator (7200 RIS) (Vespel)	G7005-20442	N/A	N/A	7200A/B
CI Repeller Insulator/bushing (7200 RIS) (Ceramic)	G7005-20030	N/A	N/A	7200A/B

HydroInert coated lenses for 5977/7000 Series

Part Description	Part Number	SQ	TQ	QTOF
HydroInert Repeller	G7078-20902	5977x	7000C/D/E	N/A
Ext Source Body – HydroInert	G7078-20903	5977x	7000C/D/E	N/A
HydroInert Extractor lens (9mm)	G7078-20909	5977x	7000C/D/E	N/A
Ion Focus Lens – HydroInert	G7078-20905	5977x	7000C/D/E	N/A
Entrance Lens – HydroInert	G7078-20904	5977x	7000C/D/E	N/A

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Heater/Sensor assemblies for 5973/5975/5977/7000/7010/7200/7250 Series

Part Description	Part Number	SQ	TQ	QTOF
Stainless Steel Heater/Sensor assembly (SST EI 350)	G3870-67180	597X	N/A	N/A
Inert Heater/Sensor assembly (inert EI 350)	G3870-67179	597X	7000A/B	N/A
Extractor Heater/Sensor assembly (Xtr EI 350)	G3870-67177	5977x	7000C/D/E	N/A
H2 EI Heater/Sensor Assembly – HydroInert (H2 EI 350)	G7078-67910	5977x	7000C/D/E	N/A
CI 350 Heater/Sensor Assembly (CI 350)	G3870-67415	597X	70X0x	N/A
Ring heater/sensor assembly (HES, HES 2.0, RIS and LEEI) (ceramic ring)	G7002-60058	5977B/C	7010x	72X0

Rough pump hoses 5973/5975/5977/7000/7010/7200/7250 Series

Part Description	Part Number	SQ	TQ	QTOF
Foreline Hose - imbedded spring	G7077-60119	597X	70X0x	72X0

Common MS Maintenance Supplies

Part Description	Part Number	SQ	TQ	QTOF
Abrasive paper, 30 µm	5061-5896	597X	70X0	72X0
Alumina powder	393706201	597X	70X0	72X0
Cloths, clean (pkg of 15)	05980-60051	597X	70X0	72X0
Cloths, cleaning (pkg of 300)	9310-4828	597X	70X0	72X0
Cotton swabs (pkg of 100)	5080-5400	597X	70X0	72X0
Gloves, clean, large	8650-0030	597X	70X0	72X0
Gloves, clean, small	8650-0029	597X	70X0	72X0

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Agilent

Teledyne Tekmar ATOMX Purge and Trap
Preventive Maintenance Checklist - Standard

Agilent Technologies

Agilent Preventive Maintenance provides factory recommended service for your analytical systems to assure reliable operation and the accuracy of your results. Delivered by highly-trained and certified service engineers using genuine Agilent parts and supplies, Agilent Preventive Maintenance provides everything you need to reduce unplanned downtime and keep your systems operating at their peak.

For more information about Agilent Technologies services please visit our web site using the following URL http://www.chem.agilent.com/en-us/products/services/pages/default.aspx

Customer Information

- Customers should provide all necessary operating supplies upon request of the engineer.
- A customer representative should be available to the engineer while performing the preventive maintenance procedures.
- Any parts, not included in the Parts Lists section of this document, are not part of the recommended Preventive Maintenance service, nor are they included in the price of this service.
- If a system requires the use of additional or special procedures and/or parts for the instrument service, then these must be ordered separately and charged as a repair, which may incur additional costs.

Service Engineer's Responsibilities

- Only complete/printout pages that relate to the system or module being serviced.
- Complete empty fields with the relevant information.
- Complete the relevant checkboxes in the checklist using a "X" or tick mark "✓" in the checkbox.
- Complete Not Applicable check boxes to indicate services not delivered, as needed.
- Complete the PM service in the order of the tasks listed.
- Complete the Service Review section together with the customer.

System Information

Guidance

☐ Check this box if an instrument configuration report is attached instead of completing the table.

Instrument system name and ID	GCMS
Instrument system site and location	SECOT Co Ltd
List system component product numbers	**List the serial numbers of each component**
1. TMR-ATOMX	1. US13296002
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.
7.	7.
8.	8.
9.	9.
10.	10.

Preparation

☑ Discuss any specific issues with the customer prior to starting.
☑ Review the instrument logbook.
☑ Save instrument control settings before starting the procedure.
☑ Perform general inspection of system for cleanliness
☑ Check for proper installation of safety-related parts, assemblies , sensors etc
☑ Check for required firmware updates and verify with customers if they would like it installed.

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Check External Supplies

☐ **Section NOT Applicable**
☑ Verify the gas source is supplying an input pressure of 50 - 100 psi to the ATOMX. If the customer is using a gas cylinder, verify the cylinder is at 500+ psi.
☑ Verify that the waste container has sufficient volume to contain the waste generated. Empty if necessary.
☑ Replace the DI water supply with fresh DI water.
  - Make sure the DI water supply is sufficient for sample analysis (1 Liter minimum)
☑ Make sure the methanol supply is sufficient for sample analysis.

Atomx Leak and Pressure Check

☐ **Section NOT Applicable**
☑ Scan through the sample log to verify that the purge pressures are staying consistent throughout the daily runs.
☑ Use the Teklink software to check the standard pressure.
☑ Run a leak check to ensure that the unit is leak tight.

Inspect ATOMX Hardware

☐ **Section NOT Applicable**
☑ Check the tray vial holes for foreign particles. Clean if necessary.
☑ Inspect the needle for particles or sample build up. Clean if necessary.
☑ Inspect the sparger glassware for damage and/or discoloration that could restrict flow or cause contamination. Replace if necessary.
☑ Inspect the drain tubing for clogging. Replace the drain line if necessary.
☑ Lubricate the ATOMX Carousel Drive. Refer to the diagram on page 6-25 of the ATOMX User Manual for lubrication points. Teledyne Tekmar recommends using DuPont Krytox lubrication.
☑ Lubricate the ATOMX Elevator. Refer to the diagram on page 6-32 of the ATOMX User Manual for lubrication points. Teledyne Tekmar recommends using DuPont Krytox lubrication.

Restore Instrument

Guidance

If the PM service is performed prior to a qualification service, then use the qualification procedure as a guide for final instrument set up and checkout.

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Service Review

- ☑ Attach available reports/printouts of all tests to this documentation.
- ☑ Record the PM service activity in the customer's instrument records/logbook
- ☑ Update/reset instrument maintenance counters as appropriate
- ☑ Affix the PM sticker to the system or instrument logbook based on the customer's request.
- ☑ Complete the Service Engineer Comments section below if there are additional comments
- ☑ Review the service and any test results with the customer.
- ☑ If the Instrument firmware was updated, record the details of the change in the Service Engineer's Comments box below or if necessary, in the customer's IQ records.

Product or Product Type Test Results Table

Test Description	Expected Test Result	Actual Test Result
Leak Test	Pass	Pass

Product or Product Type Parts List Table

Part Description	Part Number	Product or Model# where used	Quantity Consumed
Sparger Glassware	Ask the customer what size sparger glassware they are using; refer to the ATOMX parts list for part numbers.	TMR-ATOMX	1
Lubricant, Dupont Krytok	15-0293-000	TMR-ATOMX	1
Tubing, Drain, Self Retracting	15-0087-002	TMR-ATOMX	1

Service Engineer Comments (optional)

If there are any specific points you wish to note as part of performing the service or other items of interest for the customer, please write in this box.

Other Important Customer Web Links

- ❑ How to get information on your product: Literature Library - http://www.agilent.com/chem/library
- ❑ Need to know more? - www.agilent.com/chem/education
- ❑ Need technical support, FAQs? - www.agilent.com/chem/techsupp
- ❑ Need supplies? - www.agilent.com/chem/supplies

Service Completion

Service request number 6008100914 Date service completed 13 Feb 2026

Agilent signature [signature] Customer signature Jutarat J.

Number of pages in this document _____

ภาคผนวก จ

หนังสืออนุญาตขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน จากกรมโรงงานอุตสาหกรรม

ที่ อก ๐๓๑๐(๑)/ ๔๐๕๖

กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ เขตราชเทวี
กรุงเทพมหานคร ๑๐๔๐๐

๑๙ มิถุนายน ๒๕๖๙

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท ซีคอท จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และขนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน ลงวันที่ ๒ เมษายน ๒๕๖๙

สิ่งที่ส่งมาด้วย ๑. รายชื่อผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๑ แผ่น
๒. รายชื่อเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๑ แผ่น
๓. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๑ แผ่น

ตามคำขอที่อ้างถึง บริษัท ซีคอท จำกัด ขอต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ว-๒๓๙ สถานที่ตั้งเลขที่ ๒๓๙ ถนนริมคลองประปา แขวงบางขื่อ เขตบางขื่อ กรุงเทพมหานคร ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท ซีคอท จำกัด ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมห้องปฏิบัติการวิเคราะห์เอกชน จำนวน ๙ ราย ตามสิ่งที่ส่งมาด้วย ๑
ข. เจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน จำนวน ๔๐ ราย ตามสิ่งที่ส่งมาด้วย ๒
ค. ขอบข่ายชนิดสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำ/น้ำเสีย น้ำใต้ดิน อากาศเสีย สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว และดิน ตามสิ่งที่ส่งมาด้วย ๓

หนังสือฉบับนี้จะหมดอายุในวันที่ ๒ พฤษภาคม ๒๕๗๓ หากประสงค์จะต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อกรมโรงงานอุตสาหกรรมภายใน ๖๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายศิระ จันทร์เฉิด)
นักวิทยาศาสตร์เชี่ยวชาญ รักษาราชการแทน
ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน
กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ
โทร. ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕
โทรสาร ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๙๙
ไปรษณีย์อิเล็กทรอนิกส์ saraban@diw.mail.go.th

Green Industry
"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท ซีคอท จำกัด เลขทะเบียน ว-๒๓๙
ที่ อก ๐๓๑๐(๑)/ ๔๐๕๖ ลงวันที่ ๑๙ มิถุนายน ๒๕๖๙

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๙ ราย

๑) นายขรรชัย เกรียงไกรอุดม	ทะเบียนเลขที่ ว-๒๓๙-ค-๐๐๐๒
๒) นางสมฤดี เกรียงไกรอุดม	ทะเบียนเลขที่ ว-๒๓๙-ค-๐๐๐๓
๓) นางสาวเขมชุดา อินทร์ศร	ทะเบียนเลขที่ ว-๒๓๙-ค-๐๐๐๕
๔) นางสาวปรีดา สมใจ	ทะเบียนเลขที่ ว-๒๓๙-ค-๐๐๐๖
๕) นางสาวอรัญญา มาตา	ทะเบียนเลขที่ ว-๒๓๙-ค-๐๐๐๗
๖) นางสาวลดาวัลย์ วงศ์เจริญ	ทะเบียนเลขที่ ว-๒๓๙-ค-๐๐๐๘
๗) นางสาวมณีวรรณ เกตะวันดี	ทะเบียนเลขที่ ว-๒๓๙-ค-๐๐๐๙
๘) นางสาวนริสา ภูวสรรเพ็ชญ์	ทะเบียนเลขที่ ว-๒๓๙-ค-๐๐๑๐
๙) นางสาวศิริวรรณ ฉิมสง่า	ทะเบียนเลขที่ ว-๒๓๙-ค-๐๐๑๑

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท ซีคอท จำกัด เลขทะเบียน ว-๒๓๙
ที่ อก ๐๓๑๐(๑)/๕๐๕๖ ลงวันที่ ๑๙ มิถุนายน ๒๕๖๙

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๔๐ ราย

๑) นางสาวสุดาพร สุนทร ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๐๑
๒) นางสาวสุธาทิพย์ เทียนเตี้ย ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๐๓
๓) นางสาวสุนันทา ศิรวุฒินานนท์ ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๐๔
๔) นายบวร ดีชัยยะ ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๐๕
๕) นางสาวเกศรินทร์ วรเดชวิทยา ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๐๖
๖) นายอนิวัฒน์ พิมวันนา ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๐๗
๗) นายชิตพล สมประสงค์ ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๐๘
๘) นางสาวศศิธร พรหมประเสริฐ ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๐๙
๙) นายศิวะนนท์ กุลวงษ์ ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๑๐
๑๐) นางสาวอลิษา คนิวรานนท์ ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๑๑
๑๑) นางสาวสิริวรรณ แก้วชิงดวง ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๑๒
๑๒) นางสาวปัทมวรรณ สุวรรณวิโรจน์ ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๑๓
๑๓) นางสาวกนิษฐา เจริญเชื้อ ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๑๔
๑๔) นายซอง เฮงชวัลกุล ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๑๖
๑๕) นางสาวพรนภา บุตรธรรม ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๑๘
๑๖) นางสาวธาริณี อาจปลิว ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๑๙
๑๗) นางสาวจุฑารัตน์ แจ่มเรือน ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๒๒
๑๘) นางสาวจณิสตา กุ้ยอ่อน ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๒๓
๑๙) นายกิตติพงศ์ ถะเกิงสุข ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๒๔
๒๐) นายจีรวัฒน์ โคตรคำหาญ ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๒๕
๒๑) นายชนะพล อัครผล ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๒๖
๒๒) นางสาวทิพย์สุดา วรรณการ ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๒๗
๒๓) นายสิทธิชัย สว่างวงศ์ไชย ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๒๘
๒๔) นายพิษณุ สีนามเพ็ง ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๒๙
๒๕) นายธนาวุฒิ ด่วนแสง ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๓๑
๒๖) นายรอมฎอน เหล็มหมาด ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๓๕
๒๗) นางสาววิระยา ปัจฉิมบูรณ์ ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๓๘
๒๘) นางสาวสุภาพร สุวรรณมณี ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๔๐
๒๙) นางสาวณัฐณิชา วิลัยทอง ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๔๑
๓๐) นางสาวนิศารัตน์ พิมจินดา ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๔๒
๓๑) นายพงศ์ศิริ จักรแก้ว ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๔๓
๓๒) นายอรรถชัย นวนนิ่ม ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๔๔
๓๓) นางสาวรัตน์ติยากร ชื่นชม ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๔๕
๓๔) นางสาวชนิตา หล่ำสาย ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๔๖
๓๕) นางสาวตวงกมล ทองหิรัญ ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๔๗
๓๖) นายอภิวัฒน์ เมฆสุวรรณ์ ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๔๘
๓๗) นางสาวบุณยนุช รุ่นแรก ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๔๙
๓๘) นางสาวปวริศา มากภักดี ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๕๐
๓๙) นางสาว เจตนา กำรัมย์ ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๕๑
๔๐) นายณัฐชัย ไชยโคตร ทะเบียนเลขที่ ว-๒๓๙-๑-๐๐๕๒

ฤทธิ์

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
บริษัท ซีคอท จำกัด เลขทะเบียน ว-๒๓๙
ที่ อก ๐๓๑๐(๑)/๕๐๕๖ ลงวันที่ ๑๙ มิถุนายน ๒๕๖๙

ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๖๔ รายการ

น้ำ/น้ำเสีย จำนวน 45 รายการ

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

ฤทธิ์

10 Chemical...

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

2) Liquid-Liquid...

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

31 Manganese...

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

ต่อหน้า
น้ำใต้ดิน...

น้ำใต้ดิน จำนวน 129 รายการ

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

ต่อหน้า

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

ต่อหน้า ๗

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
32	Chloroform	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
33	2-Chlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
34	Chromium	1) Digestion, Flame Atomic Absorption Spectrometric Method[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method[4] 3) Digestion, Inductively Coupled Plasma Spectrometric Method[4]
35	Chromium (III)	Calculation[4]
36	Chromium (VI)	1) Colorimetric Method[4] 2) Extraction, Air-Acetylene Flame Method[4]
37	Chrysene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
38	Copper	Digestion, Inductively Coupled Plasma Method[4]
39	Cyanide	1) Distillation, Titrimetric Method[4] 2) Distillation, Colorimetric Method[4]
40	2,4-D	Liquid-Liquid Extraction, Gas Chromatographic Method[4]
41	DDD	1) Liquid-Liquid Extraction, Gas Chromatographic Method[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
42	DDE	1) Liquid-Liquid Extraction, Gas Chromatographic Method[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
43	DDT	1) Liquid-Liquid Extraction, Gas Chromatographic Method[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
44	Dibenz(a,h)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
45	Di-n-butyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
46	1,2-Dichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]

ต่อหน้า ๗

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
47	1,3-Dichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
48	1,4-Dichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
49	3,3′-Dichlorobenzidine	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
50	1,1-Dichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
51	1,2-Dichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
52	1,1-Dichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
53	cis-1,2-Dichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
54	trans-1,2-Dichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
55	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
56	1,2-Dichloropropane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
57	1,3-Dichloropropane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
58	1,3-Dichloropropene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
59	Dieldrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
60	Diethyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
61	2,4-Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
62	2,4-Dinitrophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
63	2,4-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]

ต่อไป

64 2,6-Dinitrotoluene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
64	2,6-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
65	Di-n-Octyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
66	Endosulfan	1) Liquid-Liquid Extraction, Gas Chromatographic Method[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
67	Endrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
68	Ethylbenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
69	Fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
70	Fluorene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
71	Heptachlor	1) Liquid-Liquid Extraction, Gas Chromatographic Method[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
72	Heptachlor epoxide	1) Liquid-Liquid Extraction, Gas Chromatographic Method[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
73	Hexachlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
74	Hexachloro-1,3-butadiene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
75	n-Hexane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
76	α-HCH	1) Liquid-Liquid Extraction, Gas Chromatographic Method[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]

ต่อไป

77 β-HCH...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
77	β-HCH	1) Liquid-Liquid Extraction, Gas Chromatographic Method[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
78	γ-HCH	1) Liquid-Liquid Extraction, Gas Chromatographic Method[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
79	Hexachlorocyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
80	Hexachloroethane	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
81	Indeno(1,2,3-cd)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
82	Iron	Digestion, Inductively Coupled Plasma Method[4]
83	Isophorone	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
84	Lead	1) Digestion, Flame Atomic Absorption Spectrometric Method[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method[4] 3) Digestion, Inductively Coupled Plasma Spectrometric Method[4]
85	Manganese	1) Digestion, Flame Atomic Absorption Spectrometric Method[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method[4] 3) Digestion, Inductively Coupled Plasma Spectrometric Method[4]
86	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method[4]
87	Methanol	Purge and Trap Gas Chromatographic/Mass spectrometric Method[4]
88	Methoxychlor	1) Liquid-Liquid Extraction, Gas Chromatographic Method[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]

89 Methyl bromide...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
89	Methyl bromide	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
90	Methylene chloride	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
91	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
92	2-Methylnaphthalene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
93	Methyl tert-butyl ether	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
94	Molybdenum	Digestion, Inductively Coupled Plasma Method[4]
95	Naphthalene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
96	Nickel	1) Digestion, Flame Atomic Absorption Spectrometric Method[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method[4] 3) Digestion, Inductively Coupled Plasma Spectrometric Method[4]
97	Nitrobenzene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
98	N-Nitrosodiphenylamine	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
99	N-Nitrosodi-n-propylamine	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
100	PCBs	Liquid-Liquid Extraction, Gas Chromatographic Method[4]
101	Pentachlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
102	pH	Electrometric method[4]
103	Phenanthrene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
104	Phenol	1) Distillation, Chloroform Extraction Method[4] 2) Distillation, Direct Photometric Method[4] 3) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
105	Pyrene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]

106 Selenium...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
106	Selenium	1) Digestion, Hydride Generation Atomic Absorption Spectrometric Method[4] 2) Digestion, Inductively Coupled Plasma Method[4]
107	Silver	1) Digestion, Flame Atomic Absorption Spectrometric Method[4] 2) Digestion, Inductively Coupled Plasma Method[4]
108	Styrene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
109	1,1,2,2-Tetrachloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
110	Tetrachloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
111	Toluene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
112	TPH (C_5-C_8)	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[12,26]
113	TPH ($C_{>8}$-C_{16})	1) Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[9,21] 2) Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass spectrometric Method[9,27]
114	TPH ($C_{>16}$-C_{35})	1) Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[9,21] 2) Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass spectrometric Method[9,27]
115	1,2,4-Trichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
116	1,1,1-Trichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
117	1,1,2-Trichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
118	Trichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
119	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]
120	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[4]

121 1,3,5-Trimethylbenzene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
121	1,3,5-Trimethylbenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
122	Vanadium	Digestion, Inductively Coupled Plasma Spectrometric Method[4]
123	Vinyl acetate	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
124	Vinyl chloride	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
125	m-Xylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
126	o-Xylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
127	p-Xylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
128	Xylene (Total)	Purge and Trap Gas Chromatographic/Mass Spectrometric Method[4]
129	Zinc	1) Digestion, Direct Air-Acetylene Flame Method[4] 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method[4] 3) Digestion, Inductively Coupled Plasma Spectrometric Method[4]

<u>อากาศเสีย (ปล่องระบาย) จำนวน 27 รายการ</u>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Antimony	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[5]
2	Arsenic	1) Isokinetic Sampling, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[5]
3	Beryllium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[5]

4 Cadmium...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
4	Cadmium	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[5]
5	Carbon monoxide	Instrumental Analyzer Method[5]
6	Chlorine	1) Absorption Sampling, Ion Chromatographic Method[5] 2) Isokinetic Sampling, Ion Chromatographic Method[5]
7	Chromium	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[5]
8	Cobalt	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[5]
9	Copper	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[5]
10	Cresol	Adsorption Sampling, Gas Chromatographic Method[5]
11	Dioxin/Furans	Isokinetic Sampling[5]
12	Hydrogen chloride	1) Absorption Sampling, Ion Chromatographic Method[5] 2) Isokinetic Sampling, Ion Chromatographic Method[5]
13	Hydrogen Fluoride	1) Absorption Sampling, Ion Chromatographic Method[5] 2) Isokinetic Sampling, Ion Chromatographic Method[5]
14	Hydrogen Sulfide	Absorption Sampling, Iodometric Method[5]
15	Lead	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[5]
16	Manganese	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[5]
17	Mercury	Isokinetic Sampling, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method[5]
18	Nickel	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method[5]

2) Isokinetic...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
		2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[5]
19	Opacity	Ringelmann's Method[1]
20	Oxides of Nitrogen	1) Absorption Sampling, Phenoldisulfonic acid Method[5] 2) Absorption Sampling, Ion Chromatographic Method[5] 3) Instrumental Analyzer Method[5]
21	Selenium	1) Isokinetic Sampling, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method[5] 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[5]
22	Sulfur dioxide	1) Isokinetic Sampling, Barium-Thorin Titrimetric Method[5] 2) Absorption Sampling, Barium-Thorin Titrimetric Method[5] 3) Instrumental Analyzer Method[5]
23	Sulfuric acid	Isokinetic Sampling, Barium-Thorin Titrimetric Method[5]
24	Tin	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[5]
25	Total Suspended Particulate	1) Isokinetic Sampling, Gravimetric Method[5] 2) Paired Train, Isokinetic Sampling, Gravimetric Method[5]
26	Vanadium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method[5]
27	Xylene	1) Adsorption Sampling, Gas Chromatographic Method[5] 2) Adsorption Sampling, Gas Chromatographic/Mass Spectrometric Method[5]

<u>สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว จำนวน 34 รายการ</u>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[3,6,9,22] 2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[3,6,9,27]

3) Soxhlet...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
		3) Soxhlet Extraction, Gas Chromatographic Method[10,22]
		4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
2	Antimony	1) Waste Extraction, Digestion, Hydride Generation/ Atomic Absorption Spectrometric Method[3,6,16]
		2) Waste Extraction, Digestion, Inductively Coupled Plasma Method[3,6,14]
		3) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method[7,16]
		4) Digestion, Inductively Coupled Plasma Method[7,14]
3	Arsenic	1) Waste Extraction, Digestion, Hydride Generation/ Atomic Absorption Spectrometric Method[3,6,16]
		2) Waste Extraction, Digestion, Inductively Coupled Plasma Method[3,6,14]
		3) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method[7,16]
		4) Digestion, Inductively Coupled Plasma Method[7,14]
4	Barium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method[3,6,15]
		2) Waste Extraction, Digestion, Inductively Coupled Plasma Method[3,6,14]
		3) Digestion, Flame Atomic Absorption Spectrometric Method[7,15]
		4) Digestion, Inductively Coupled Plasma Method[7,14]
5	Beryllium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[3,6,14]
		2) Digestion, Inductively Coupled Plasma Method[7,14]
6	Cadmium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method[3,6,15]
		2) Waste Extraction, Digestion, Inductively Coupled Plasma Method[3,6,14]
		3) Digestion, Flame Atomic Absorption Spectrometric Method[7,15]
		4) Digestion, Inductively Coupled Plasma Method[7,14]
7	Chlordane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[3,9,22]

ต่อไป

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
		2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[3,9,27]
		3) Soxhlet Extraction, Gas Chromatographic Method[10,22]
		4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
8	Chromium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method[3,6,15]
		2) Waste Extraction, Digestion, Inductively Coupled Plasma Method[3,6,14]
		3) Digestion, Flame Atomic Absorption Spectrometric Method[7,15]
		4) Digestion, Inductively Coupled Plasma Method[7,14]
9	Chromium (III)	Calculation[3,6,7,8,14,15,17]
10	Chromium (VI)	1) Waste Extraction, Colorimetric Method[3,17]
		2) Alkaline Digestion, Colorimetric Method[8,17]
11	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[3,6,14]
		2) Digestion, Inductively Coupled Plasma Method[7,14]
12	Copper	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method[3,6,15]
		2) Waste Extraction, Digestion, Inductively Coupled Plasma Method[3,6,14]
		3) Digestion, Flame Atomic Absorption Spectrometric Method[7,15]
		4) Digestion, Inductively Coupled Plasma Method[7,14]
13	2,4-D	1) Waste Extraction, Gas Chromatographic/Mass Spectrometric Method[3,25]
		2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[25]
14	DDD	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[3,9,22]
		2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[3,9,27]
		3) Soxhlet Extraction, Gas Chromatographic Method[10,22]

ต่อไป

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
		4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
15	DDE	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[3,9,22]
		2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[3,9,27]
		3) Soxhlet Extraction, Gas Chromatographic Method[10,22]
		4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
16	DDT	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[3,9,22]
		2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[3,9,27]
		3) Soxhlet Extraction, Gas Chromatographic Method[10,22]
		4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
17	Dieldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[3,9,22]
		2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[3,9,27]
		3) Soxhlet Extraction, Gas Chromatographic Method[10,22]
		4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
18	Endrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[3,9,22]
		2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[3,9,27]
		3) Soxhlet Extraction, Gas Chromatographic Method[10,22]
		4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
19	Heptachlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[3,9,22]
		2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[3,9,27]

3) Soxhlet Extraction...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
		3) Soxhlet Extraction, Gas Chromatographic Method[10,22]
		4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
20	Lead	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method[3,6,15]
		2) Waste Extraction, Digestion, Inductively Coupled Plasma Method[3,6,14]
		3) Digestion, Flame Atomic Absorption Spectrometric Method[7,15]
		4) Digestion, Inductively Coupled Plasma Method[7,14]
21	Lindane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[3,9,22]
		2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[3,9,27]
		3) Soxhlet Extraction, Gas Chromatographic Method[10,22]
		4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
22	Mercury	1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method[3,18]
		2) Waste Extraction, Digestion, Inductively Coupled Plasma Method[3,6,14]
		3) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method[19]
		4) Digestion, Inductively Coupled Plasma Method[7,14]
23	Methoxychlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[3,9,22]
		2) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method[3,9,27]
		3) Soxhlet Extraction, Gas Chromatographic Method[10,22]
		4) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
24	Molybdenum	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[3,6,14]
		2) Digestion, Inductively Coupled Plasma Method[7,14]

25 Nickel...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
25	Nickel	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method[3,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method[3,6,14] 3) Digestion, Flame Atomic Absorption Spectrometric Method[7,15] 4) Digestion, Inductively Coupled Plasma Method[7,14]
26	PCBs	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method[3,9,23] 2) Soxhlet Extraction, Gas Chromatographic Method[10,23]
27	Pentachlorophenol	1) Waste Extraction, Gas Chromatographic/Mass Spectrometric Method[3,25] 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[25]
28	pH	Electrometric Method[31,32]
29	Selenium	1) Waste Extraction, Digestion, Hydride Generation/ Atomic Absorption Spectrometric Method[3,6,20] 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method[3,6,14] 3) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method[7,20] 4) Digestion, Inductively Coupled Plasma Method[7,14]
30	Silver	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[3,6,14] 2) Digestion, Inductively Coupled Plasma Method[7,14]
31	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[3,6,14] 2) Digestion, Inductively Coupled Plasma Method[7,14]
32	Trichloroethylene	1) Waste Extraction, Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[3,12,26] 2) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[12,26]
33	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method[3,6,14] 2) Digestion, Inductively Coupled Plasma Method[7,14]

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

ดิน จำนวน 129 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
2	Acetone	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
3	Aldrin	1) Ultrasonic Extraction, Gas Chromatographic Method[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[11,27]
4	Aluminum	Digestion, Inductively Coupled Plasma Method[7,14]
5	Anthracene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
6	Antimony	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method[7,16] 2) Digestion, Inductively Coupled Plasma Method[7,14]
7	Arsenic	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method[7,16] 2) Digestion, Inductively Coupled Plasma Method[7,14]
8	Atrazine	Ultrasonic Extraction, Gas Chromatographic Method[11,24]
9	Barium	1) Digestion, Flame Atomic Absorption Spectrometric Method[7,15] 2) Digestion, Inductively Coupled Plasma Method[7,14]
10	Benzo(a)anthracene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
11	Benzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method[13,26]

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
12	Benzo(b)fluoranthene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
13	Benzo(k)fluoranthene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
14	Benzoic acid	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[11,27]
15	Benzo(a)pyrene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
16	Benzo(ghi)perylene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
17	Beryllium	Digestion, Inductively Coupled Plasma Method[7,14]
18	Bis(2-chloroethyl)ether	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
19	Bis(2-ethylhexyl)phthalate	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
20	Bromodichloromethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
21	Bromoform	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
22	Butanol	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
23	Butyl benzyl phthalate	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
24	Cadmium	1) Digestion, Flame Atomic Absorption Spectrometric Method[7,15] 2) Digestion, Inductively Coupled Plasma Method[7,14]
25	Carbazole	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
26	Carbon disulfide	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
27	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
28	Chlordane	1) Ultrasonic Extraction, Gas Chromatographic Method[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[11,27]

29 p-Chloroaniline...

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

45 Di-n-butyl phthalate...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
45	Di-n-butyl phthalate	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
46	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
47	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
48	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
49	3,3′-Dichlorobenzidine	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
50	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
51	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
52	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
53	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
54	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
55	2,4-Dichlorophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[11,27]
56	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
57	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
58	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
59	Dieldrin	1) Ultrasonic Extraction, Gas Chromatographic Method[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[11,27]
60	Diethyl phthalate	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
61	2,4-Dimethylphenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[11,27]

ต่อไป

62 2,4-Dinitrophenol...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
62	2,4-Dinitrophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[11,27]
63	2,4-Dinitrotoluene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
64	2,6-Dinitrotoluene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
65	Di-n-Octyl phthalate	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
66	Endosulfan	1) Ultrasonic Extraction, Gas Chromatographic Method[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[11,27]
67	Endrin	1) Ultrasonic Extraction, Gas Chromatographic Method[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[11,27]
68	Ethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
69	Fluoranthene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
70	Fluorene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
71	Heptachlor	1) Ultrasonic Extraction, Gas Chromatographic Method[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[11,27]
72	Heptachlor epoxide	1) Ultrasonic Extraction, Gas Chromatographic Method[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[11,27]
73	Hexachlorobenzene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[11,27]
74	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
75	n-Hexane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]

ต่อไป

76 α-HCH...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
76	α-HCH	1) Ultrasonic Extraction, Gas Chromatographic Method[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[11,27]
77	β-HCH	1) Ultrasonic Extraction, Gas Chromatographic Method[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[11,27]
78	γ-HCH	1) Ultrasonic Extraction, Gas Chromatographic Method[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[11,27]
79	Hexachlorocyclopentadiene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
80	Hexachloroethane	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
81	Indeno(1,2,3-cd)pyrene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
82	Iron	Digestion, Inductively Coupled Plasma Method[7,14]
83	Isophorone	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
84	Lead	1) Digestion, Flame Atomic Absorption Spectrometric Method[7,15] 2) Digestion, Inductively Coupled Plasma Method[7,14]
85	Manganese	1) Digestion, Flame Atomic Absorption Spectrometric Method[7,15] 2) Digestion, Inductively Coupled Plasma Method[7,14]
86	Mercury	1) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method[19] 2) Digestion, Inductively Coupled Plasma Method[7,14]
87	Methanol	1) Ultrasonic Extraction, Gas Chromatographic Method[11,21] 2) Equilibrium Headspace, Gas Chromatographic Method[11,21]

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
88	Methoxychlor	1) Ultrasonic Extraction, Gas Chromatographic Method[11,22] 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[11,27]
89	Methyl bromide	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
90	Methylene chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
91	Molybdenum	Digestion, Inductively Coupled Plasma Method[2,3]
92	2-Methylphenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[11,27]
93	2-Methylnaphthalene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[11,27]
94	Methyl tert-butyl ether	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
95	Naphthalene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
96	Nickel	1) Digestion, Flame Atomic Absorption Spectrometric Method[7,15] 2) Digestion, Inductively Coupled Plasma Method[7,14]
97	Nitrobenzene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
98	N-Nitrosodiphenylamine	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
99	N-Nitrosodi-n-propylamine	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
100	PCBs	Soxhlet Extraction, Gas Chromatographic Method[10,23]
101	Pentachlorophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[24]
102	pH	Electrometric Method[4]
103	Phenanthrene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
104	Phenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[11,27]
105	Pyrene	Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
106	Selenium	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method[7,20] 2) Digestion, Inductively Coupled Plasma Method[7,14]
107	Silver	1) Digestion, Flame Atomic Absorption Spectrometric Method[7,15] 2) Digestion, Inductively Coupled Plasma Method[7,14]
108	Styrene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
109	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
110	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
111	Toluene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
112	TPH (C_5-C_8)	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
113	TPH ($C_{>8}$-C_{16})	1) Soxhlet Extraction, Gas Chromatographic Method[10,21] 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
114	TPH ($C_{>16}$-C_{35})	1) Soxhlet Extraction, Gas Chromatographic Method[10,21] 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method[10,27]
115	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
116	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
117	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
118	Trichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
119	2,4,5-Trichlorophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[11,27]
120	2,4,6-Trichlorophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method[11,27]

121 1,3,5-Trimethylbenzene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
121	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
122	Vanadium	Digestion, Inductively Coupled Plasma Method[7,14]
123	Vinyl acetate	Purge and Trap, Gas Chromatographic/Mass spectrometric Method[13,26]
124	Vinyl chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
125	m-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
126	o-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
127	p-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
128	Xylene (Total)	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method[13,26]
129	Zinc	1) Digestion, Flame Atomic Absorption Spectrometric Method[7,15] 2) Digestion, Inductively Coupled Plasma Method[7,14]

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ภาคผนวก ฉ

ใบรับรองความสามารถห้องปฏิบัติการและขอบข่ายการรับรองห้องปฏิบัติการทดสอบ ตามมาตรฐาน ISO/IEC 17025 จากสำนักงานมาตรฐานอุตสาหกรรม (สมอ.)

แบบ กมช./สมอ.๒
Form NSC/TISI 2

ใบรับรองเลขที่ 24-LB0026
(Certificate No.)

ใบรับรองระบบงาน
(Certificate of Accreditation)

อาศัยอำนาจตามความในพระราชบัญญัติการมาตรฐานแห่งชาติ พ.ศ. ๒๕๕๑
(By Virtue of National Standardization Act B.E. 2551 (2008))

เลขาธิการสำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม
(Secretary-General, Thai Industrial Standards Institute)

ออกใบรับรองฉบับนี้ให้
(Issues this certificate to)

บริษัท ซีคอท จำกัด ฝ่ายห้องปฏิบัติการทดสอบด้านสิ่งแวดล้อม
(Secot Company Limited, Environmental Laboratory Division)

ตั้งอยู่เลขที่
(Address)

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(239 Rimklongprapa Road, Bangsue, Bangsue, Bangkok)

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(Certificate of competence)

ตามมาตรฐานเลขที่ มอก. ๑๗๐๒๕ - ๒๕๖๑
(Standard No. TIS 17025-2561 (2018) (ISO/IEC 17025: 2017))

ข้อกำหนดทั่วไปว่าด้วยความสามารถของ ห้องปฏิบัติการทดสอบและห้องปฏิบัติการสอบเทียบ
(General requirements for the competence of testing and calibration laboratories)

หมายเลขการรับรองที่ ทดสอบ ๐๓๙๔
(Accreditation No. Testing 0394)

โดยมีรายละเอียดสาขาและขอบข่ายที่ได้ใบรับรอง แสดงไว้ใน QR CODE และ www.tisi.go.th
(Details of the scheme and scope of the certificate are shown in QR CODE and www.tisi.go.th)

ออกให้ ณ วันที่ ๖ ธันวาคม พ.ศ. ๒๕๖๖
(Issue date : 6 December B.E. 2566 (2023))

(นายวีระศักดิ์ เพ็งหล้ง)
ผู้อำนวยการสำนักงานคณะกรรมการการมาตรฐานแห่งชาติ
ปฏิบัติราชการแทน
เลขาธิการสำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม

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กระทรวงอุตสาหกรรม สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม
(Ministry of Industry Thailand, Thai Industrial Standards Institute)

รายละเอียดสาขาและขอบข่ายใบรับรองห้องปฏิบัติการ
(Scope of Accreditation for Testing)
ใบรับรองเลขที่ 24-LB0026
(Certification No. 24-LB0026)

ชื่อห้องปฏิบัติการ (Laboratory Name)	บริษัท ซีคอท จำกัด ฝ่ายห้องปฏิบัติการทดสอบด้านสิ่งแวดล้อม (Secot Company Limited, Environmental Laboratory Division)					
หมายเลขการรับรองที่ (Accreditation No.)	ทดสอบ 0394 (Testing 0394)					
ฉบับที่ 03 (Issue No. 03)	ออกให้ตั้งแต่วันที่ 15 กันยายน พ.ศ. 2568 (Valid from 15 September B.E.2568 (2025))				ถึงวันที่ 8 กันยายน พ.ศ. 2571 (Until 8 September B.E.2571 (2028))	
สถานภาพห้องปฏิบัติการ (Laboratory status)	☑ ถาวร (Permanent)	☐ นอกสถานที่ (Site)	☐ ชั่วคราว (Temporary)		☐ เคลื่อนที่ (Mobile)	☐ หลายสถานที่ (Multisite)

สาขาการทดสอบ (Field of Testing)	รายการทดสอบ (Parameter)	วิธีทดสอบ (Test Method)
สาขาสิ่งแวดล้อม (Environmental field)		
1. น้ำและน้ำเสีย (Water and wastewater)	- Heavy metals • Arsenic (As) 0.000 5 mg/L to 0.090 0 mg/L	- Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WEF, 24th edition, 2023, Part 3030 F and Part 3114 C
	• Arsenic (As) 0.05 mg/L to 4.50 mg/L • Barium (Ba) 0.02 mg/L to 4.50 mg/L • Cadmium (Cd) 0.01 mg/L to 4.50 mg/L • Chromium (Cr) 0.01 mg/L to 4.50 mg/L	- Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WEF, 24th edition, 2023, Part 3030 E and Part 3120 B

รายละเอียดสาขาและขอบข่ายใบรับรองห้องปฏิบัติการ
(Scope of Accreditation for Testing)
ใบรับรองเลขที่ 24-LB0026
(Certification No. 24-LB0026)

ฉบับที่ 03 (Issue No. 03) | ออกให้ตั้งแต่วันที่ 15 กันยายน พ.ศ. 2568 (Valid from 15 September B.E.2568 (2025)) | ถึงวันที่ 8 กันยายน พ.ศ. 2571 (Until 8 September B.E.2571 (2028))

สถานภาพห้องปฏิบัติการ (Laboratory status) ☑ ถาวร (Permanent) ☐ นอกสถานที่ (Site) ☐ ชั่วคราว (Temporary) ☐ เคลื่อนที่ (Mobile) ☐ หลายสถานที่ (Multisite)

สาขาการทดสอบ (Field of Testing)	รายการทดสอบ (Parameter)	วิธีทดสอบ (Test Method)
สาขาสิ่งแวดล้อม (Environmental field) 1. น้ำและน้ำเสีย (ต่อ) (Water and wastewater) (cont.)	- Heavy metals • Copper (Cu) 0.02 mg/L to 4.50 mg/L • Iron (Fe) 0.05 mg/L to 9.00 mg/L • Lead (Pb) 0.03 mg/L to 4.50 mg/L • Manganese (Mn) 0.01 mg/L to 9.00 mg/L • Nickel (Ni) 0.01 mg/L to 4.50 mg/L • Zinc (Zn) 0.02 mg/L to 9.00 mg/L	- Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WEF, 24th edition, 2023, Part 3030 E and Part 3120 B
	- Chemical oxygen demand (COD) 10.00 mg/L to 9 000 mg/L	- Standard Methods for the Examination of Water and Wastewater, APHA, AWWA, WEF, 24th edition, 2023, Part 5220 D

รายละเอียดสาขาและขอบข่ายใบรับรองห้องปฏิบัติการ
(Scope of Accreditation for Testing)
ใบรับรองเลขที่ 24-LB0026
(Certification No. 24-LB0026)

ฉบับที่ 03 (Issue No. 03) | ออกให้ตั้งแต่วันที่ 15 กันยายน พ.ศ. 2568 (Valid from 15 September B.E.2568 (2025)) | ถึงวันที่ 8 กันยายน พ.ศ. 2571 (Until 8 September B.E.2571 (2028))

สถานภาพห้องปฏิบัติการ (Laboratory status) ☑ ถาวร (Permanent) ☐ นอกสถานที่ (Site) ☐ ชั่วคราว (Temporary) ☐ เคลื่อนที่ (Mobile) ☐ หลายสถานที่ (Multisite)

สาขาการทดสอบ (Field of Testing)	รายการทดสอบ (Parameter)	วิธีทดสอบ (Test Method)
สาขาสิ่งแวดล้อม (Environmental field) 2. บริเวณทำงาน (Workplace)	- Total dust 0.10 mg/filter to 2.00 mg/filter	- NIOSH Manual of Analytical Methods (NMAM), Method 0500, 4th edition, 15th August 1994 (Exclude Sampling)
	- Respirable dust 0.10 mg/filter to 2.00 mg/filter	- NIOSH Manual of Analytical Methods (NMAM), Method 0600, 4th edition, 15th January 1998 (Exclude Sampling)
	- Benzene 0.70 µg/tube to 420 µg/tube - Toluene 0.70 µg/tube to 420 µg/tube - Total xylenes 1.40 µg/tube to 840 µg/tube - m, p-Xylene 0.70 µg/tube to 420 µg/tube	- NIOSH Manual of Analytical Methods (NMAM), Method 1501, 4th edition, 15th March 2003 (Exclude Sampling)

รายละเอียดสาขาและขอบข่ายใบรับรองห้องปฏิบัติการ
(Scope of Accreditation for Testing)
ใบรับรองเลขที่ 24-LB0026
(Certification No. 24-LB0026)

ฉบับที่ 03 (Issue No. 03) ออกให้ตั้งแต่วันที่ 15 กันยายน พ.ศ. 2568 (Valid from 15 September B.E.2568 (2025)) ถึงวันที่ 8 กันยายน พ.ศ. 2571 (Until 8 September B.E.2571 (2028))

สถานภาพห้องปฏิบัติการ (Laboratory status) ☑ ถาวร (Permanent) ☐ นอกสถานที่ (Site) ☐ ชั่วคราว (Temporary) ☐ เคลื่อนที่ (Mobile) ☐ หลายสถานที่ (Multisite)

สาขาการทดสอบ (Field of Testing)	รายการทดสอบ (Parameter)	วิธีทดสอบ (Test Method)
สาขาสิ่งแวดล้อม (Environmental field)		
2. บริเวณทำงาน (ต่อ) (Workplace) (Cont.)	- o-Xylene 0.70 μg/tube to 420 μg/tube	- NIOSH Manual of Analytical Methods (NMAM), Method 1501, 4th edition, 15th March 2003 (Exclude Sampling)
3. ปล่องระบายอากาศ (Stack)	- Sulfur dioxide 1.00 mg/L to 16 000 mg/L	- US.EPA, Code of Federal Regulations, 40 CFR 60 appendix A, Method 6, July 2024 (Exclude Sampling)
	- Hydrogen fluoride 5 μg/sample to 400 μg/sample	- WI-7.2-1-22 based on US.EPA, Code of Federal Regulations, 40 CFR 60 appendix A, Method 26, 26A, 2024
	- Hydrogen chloride 5 μg/sample to 400 μg/sample	

รายละเอียดสาขาและขอบข่ายใบรับรองห้องปฏิบัติการ
(Scope of Accreditation for Testing)
ใบรับรองเลขที่ 24-LB0026
(Certification No. 24-LB0026)

ฉบับที่ 03 (Issue No. 03) ออกให้ตั้งแต่วันที่ 15 กันยายน พ.ศ. 2568 (Valid from 15 September B.E.2568 (2025)) ถึงวันที่ 8 กันยายน พ.ศ. 2571 (Until 8 September B.E.2571 (2028))

สถานภาพห้องปฏิบัติการ (Laboratory status) ☑ ถาวร (Permanent) ☑ นอกสถานที่ (Site) ☐ ชั่วคราว (Temporary) ☐ เคลื่อนที่ (Mobile) ☐ หลายสถานที่ (Multisite)

สาขาการทดสอบ (Field of Testing)	รายการทดสอบ (Parameter)	วิธีทดสอบ (Test Method)
สาขาสิ่งแวดล้อม (Environmental field)		
4. บรรยากาศทั่วไป (Ambient air)	- Volatile organic compounds (VOCs) • Chloroethene 0.05 μg/m^3 to 51.00 μg/m^3 (0.02 ppbv to 20.00 ppbv) • 1,3-butadiene 0.04 μg/m^3 to 44.00 μg/m^3 (0.02 ppbv to 20.00 ppbv) • Bromomethane 0.08 μg/m^3 to 77.00 μg/m^3 (0.02 ppbv to 20.00 ppbv) • Acrolein 0.05 μg/m^3 to 45.00 μg/m^3 (0.02 ppbv to 20.00 ppbv) • Acrylonitrile 0.04 μg/m^3 to 43.00 μg/m^3 (0.02 ppbv to 20.00 ppbv) • Dichloromethane 0.14 μg/m^3 to 69.00 μg/m^3 0.04 ppbv to 20.00 ppbv)	- WI-7.2-1-24 based on US EPA, Compendium Method TO-15, EPA/625/R-96/010b, Second edition, January 1999

รายละเอียดสาขาและขอบข่ายใบรับรองห้องปฏิบัติการ
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สถานภาพห้องปฏิบัติการ (Laboratory status) ☑ ถาวร (Permanent) ☑ นอกสถานที่ (Site) ☐ ชั่วคราว (Temporary) ☐ เคลื่อนที่ (Mobile) ☐ หลายสถานที่ (Multisite)

สาขาการทดสอบ (Field of Testing)	รายการทดสอบ (Parameter)	วิธีทดสอบ (Test Method)
สาขาสิ่งแวดล้อม (Environmental field) 4. บรรยากาศทั่วไป (ต่อ) (Ambient air) (cont.)	- Volatile organic compounds (VOCs) • Carbon disulfide 0.06 $\mu g/m^3$ to 62.00 $\mu g/m^3$ (0.02 ppbv to 20.00 ppbv) • Trichloromethane 0.20 $\mu g/m^3$ to 97.00 $\mu g/m^3$ (0.04 ppbv to 20.00 ppbv) • 1,2–dichloroethane 0.08 $\mu g/m^3$ to 80.00 $\mu g/m^3$ (0.02 ppbv to 20.00 ppbv) • Benzene 0.06 $\mu g/m^3$ to 63.00 $\mu g/m^3$ (0.02 ppbv to 20.00 ppbv) • Carbon tetrachloride 0.25 $\mu g/m^3$ to 125 $\mu g/m^3$ (0.04 ppbv to 20.00 ppbv) • Trichloroethylene 0.21 $\mu g/m^3$ to 107 $\mu g/m^3$ (0.04 ppbv to 20.00 ppbv)	- WI-7.2-1-24 based on US EPA, Compendium Method TO-15, EPA/625/R-96/010b, Second edition, January 1999

รายละเอียดสาขาและขอบข่ายใบรับรองห้องปฏิบัติการ
(Scope of Accreditation for Testing)
ใบรับรองเลขที่ 24-LB0026
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ฉบับที่ 03 (Issue No. 03) ออกให้ตั้งแต่วันที่ 15 กันยายน พ.ศ. 2568 (Valid from 15 September B.E.2568 (2025)) ถึงวันที่ 8 กันยายน พ.ศ. 2571 (Until 8 September B.E.2571 (2028))

สถานภาพห้องปฏิบัติการ (Laboratory status) ☑ ถาวร (Permanent) ☑ นอกสถานที่ (Site) ☐ ชั่วคราว (Temporary) ☐ เคลื่อนที่ (Mobile) ☐ หลายสถานที่ (Multisite)

สาขาการทดสอบ (Field of Testing)	รายการทดสอบ (Parameter)	วิธีทดสอบ (Test Method)
สาขาสิ่งแวดล้อม (environmental field) 4. บรรยากาศทั่วไป (ต่อ) (Ambient air) (Cont.)	- Volatile organic compounds (VOCs) • 1,2–dichloropropane 0.18 $\mu g/m^3$ to 92.00 $\mu g/m^3$ (0.04 ppbv to 20.00 ppbv) • Tetrachloroethylene 0.27 $\mu g/m^3$ to 135 $\mu g/m^3$ (0.04 ppbv to 20.00 ppbv) • 1,2–dibromoethane 0.31 $\mu g/m^3$ to 153 $\mu g/m^3$ (0.04 ppbv to 20.00 ppbv) • 1,1,2,2–tetrachloroethane 0.69 $\mu g/m^3$ to 137 $\mu g/m^3$ (0.10 ppbv to 20.00 ppbv) • Benzyl chloride 0.52 $\mu g/m^3$ to 103 $\mu g/m^3$ (0.10 ppbv to 20.00 ppbv) • 1,4–dichlorobenzene 0.24 $\mu g/m^3$ to 120 $\mu g/m^3$ (0.04 ppbv to 20.00 ppbv)	- WI-7.2-1-24 based on US EPA, Compendium Method TO-15, EPA/625/R-96/010b, Second edition, January 1999

ภาคผนวก ช

ใบอนุญาตเป็นนิติบุคคลผู้ให้บริการตรวจวัดและวิเคราะห์การทำงาน จากกรมสวัสดิการและคุ้มครองแรงงาน

แบบ กภ.บญ
นิติบุคคล

กรมสวัสดิการและคุ้มครองแรงงาน
ใบอนุญาต
เป็นนิติบุคคลผู้ให้บริการตรวจวัดระดับความเข้มข้นของสารเคมีอันตราย
ในบรรยากาศของสถานที่ทำงานและสถานที่เก็บรักษาสารเคมีอันตราย

ใบอนุญาตเลขที่ ๐๒๐๑-๐๓-๒๕๖๕-๐๐๔๙

อนุญาตให้ บริษัท ซีคอท จำกัด
เลขทะเบียนนิติบุคคล ๐๑๐๕๕๓๖๐๐๑๐๙๖
ตั้งอยู่ เลขที่ ๒๓๙ ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพมหานคร
เป็นนิติบุคคลผู้ให้บริการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน ตามกฎกระทรวงกำหนดมาตรฐานในการบริหาร จัดการ และดำเนินการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงานเกี่ยวกับสารเคมีอันตราย พ.ศ. ๒๕๕๖ ในการเป็นผู้ให้บริการตรวจวัดระดับความเข้มข้นของสารเคมีอันตรายในบรรยากาศของสถานที่ทำงานและสถานที่เก็บรักษาสารเคมีอันตราย ประกอบกับกฎกระทรวงการขึ้นทะเบียนและการอนุญาตให้บริการเพื่อส่งเสริมความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน พ.ศ. ๒๕๖๔ แห่งพระราชบัญญัติความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน พ.ศ. ๒๕๕๔ โดยมีบุคลากร จำนวน ๑๕ ราย และรายการเครื่องมือตรวจวัด จำนวน ๕๕ เครื่อง ดังรายละเอียดแนบท้ายใบอนุญาตนี้

ทั้งนี้ ตั้งแต่วันที่ ๑๔ มิถุนายน พ.ศ. ๒๕๖๘ ถึงวันที่ ๑๓ มิถุนายน พ.ศ. ๒๕๗๑

ให้ไว้ ณ วันที่ ๒๑ พฤษภาคม พ.ศ. ๒๕๖๘

(นายศักดิ์ศิลป์ ตุลาธร)
ผู้ตรวจราชการกรม ปฏิบัติราชการแทน
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน

เลขทะเบียนควบคุม
ศ-๑๑-๐๒๐๑-๐๕๐-๐๒-๖๘

(ลงนาม).....(นายทะเบียน)
(นางสาวสุวดี ทวีสุข)
ผู้อำนวยการกองความปลอดภัยแรงงาน

รายชื่อบุคลากรแนบท้ายใบอนุญาต
เป็นนิติบุคคลผู้ให้บริการตรวจวัดระดับความเข้มข้นของสารเคมีอันตรายในบรรยากาศของสถานที่ทำงาน
และสถานที่เก็บรักษาสารเคมีอันตราย
ของบริษัท ซีคอท จำกัด
ใบอนุญาตเลขที่ ๐๒๐๑-๐๓-๒๕๖๕-๐๐๔๙

๑.	นายชิตพล	สมประสงค์
๒.	นายอนิวัฒน์	พิมวันนา
๓.	นายศิวะนนท์	กุลวงษ์
๔.	นายธนโชติ	ช่างล้อ
๕.	นายกิตติพงศ์	ถะเกิงสุข
๖.	นายจีรวัฒน์	โคตรคำหาญ
๗.	นายศุภกิจ	ตีะมูกา
๘.	นางสาวทิพย์สุดา	วรรณการ
๙.	นายธนาวุฒิ	ด่วนแสง
๑๐.	นางสาวศลิษา	อินรีย์
๑๑.	นางสาววิระยา	ปัจฉิมบูรณ์
๑๒.	นายณัฐดนัย	กฤษณะโลม
๑๓.	นายณัฐชัย	ไชยโคตร
๑๔.	นายพงศ์ศิริ	จักรแก้ว
๑๕.	นายอรรถชัย	นวนนิ่ม

ทั้งนี้ ตั้งแต่วันที่ ๑๔ มิถุนายน พ.ศ. ๒๕๖๘ ถึงวันที่ ๑๓ มิถุนายน พ.ศ. ๒๕๗๑

ให้ไว้ ณ วันที่ ๒๓ พฤษภาคม พ.ศ. ๒๕๖๘

(นายศักดิ์ศิลป์ ตุลาธร)
ผู้ตรวจราชการกรม ปฏิบัติราชการแทน
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน

รายการเครื่องมือตรวจวัดแนบท้ายใบอนุญาต
เป็นนิติบุคคลผู้ให้บริการตรวจวัดระดับความเข้มข้นของสารเคมีอันตรายในบรรยากาศของสถานที่ทำงาน
และสถานที่เก็บรักษาสารเคมีอันตราย
ของบริษัท ซีคอท จำกัด
ใบอนุญาตเลขที่ ๐๒๐๑-๐๓-๒๕๖๕-๐๐๔๙

ลำดับที่	รายการเครื่องมือ	รายละเอียด		จำนวน (เครื่อง)
๑	เครื่องมือเก็บตัวอย่างอากาศ (Personal Air Sampling Pump)	ยี่ห้อ	Sensidyne Gilian	๔๖
		รุ่น	BDX II	
		Serial No.	20190401002	
			20190401003	
			20190401006	
			20190401007	
			20190401008	
			20190401013	
			20190401014	
			20190401015	
			20190401019	
			20190504021	
			20190504022	
			20190504023	
			20190504025	
			20190504027	
			20190504028	
			20190504029	
			20190504032	
			20190504034	
			20190504039	
			20190504040	
			20190504042	
			20190504044	
			20210602054	
			20210602055	
			20210701039	
			20210701078	
			20210701079	
			20210701081	

ลำดับที่	รายการเครื่องมือ	รายละเอียด		จำนวน (เครื่อง)
	เครื่องมือเก็บตัวอย่างอากาศ (ต่อ) (Personal Air Sampling Pump)		20210701082 20210701086 20210701093 20210904100 20211201089 20211201090 20220104039 20220104042 20220104045 20220104086 20220104087 20220104088 20220104089 20220104090 20220104098 20220104099 20220104100 20220104104	
		ยี่ห้อ รุ่น Serial No.	SKC Pocket Pump TOUCH 220-1000TC 221217 221218 221219 221222 221245	๕
๒	เครื่องมือและอุปกรณ์สำหรับปรับความถูกต้อง (Pump calibrator)	ยี่ห้อ รุ่น Serial No.	Mesa Labs Defender 520-L 160100	๑
		ยี่ห้อ รุ่น Serial No.	Mesa Labs Defender 520-H 114069	๑
		ยี่ห้อ รุ่น Serial No.	SKC Chek-mate 375-0550 N 22552891	๑

ลำดับที่	รายการเครื่องมือ	รายละเอียด		จำนวน (เครื่อง)
	เครื่องมือและอุปกรณ์สำหรับปรับความถูกต้อง (ต่อ) (Pump calibrator)	ยี่ห้อ รุ่น Serial No.	SKC Chek-mate 375-00205 N 21552177	๑

ทั้งนี้ ตั้งแต่วันที่ ๑๔ มิถุนายน พ.ศ. ๒๕๖๘ ถึงวันที่ ๑๓ มิถุนายน พ.ศ. ๒๕๗๑

ให้ไว้ ณ วันที่ ๒๗ พฤษภาคม พ.ศ. ๒๕๖๘

(นายศักดิ์ศิลป์ ตุลาธร)
ผู้ตรวจราชการกรม ปฏิบัติราชการแทน
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน

แบบ กภ.บญ
นิติบุคคล

กรมสวัสดิการและคุ้มครองแรงงาน
ใบอนุญาต
เป็นนิติบุคคลผู้ให้บริการวิเคราะห์ระดับความเข้มข้นของสารเคมีอันตราย
ในบรรยากาศของสถานที่ทำงานและสถานที่เก็บรักษาสารเคมีอันตราย

ใบอนุญาตเลขที่ ๐๒๐๒-๐๓-๒๕๖๕-๐๐๓๔

อนุญาตให้ บริษัท ซีคอท จำกัด
เลขทะเบียนนิติบุคคล ๐๑๐๕๕๓๖๐๐๐๙๒
ตั้งอยู่ เลขที่ ๒๓๙ ถนนริมคลองประปา แขวงบางซื่อ เขตบางซื่อ กรุงเทพมหานคร
เป็นนิติบุคคลผู้ให้บริการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน ตามกฎกระทรวงกำหนดมาตรฐานในการบริหาร จัดการ และดำเนินการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงานเกี่ยวกับสารเคมีอันตราย พ.ศ. ๒๕๕๖ ในการเป็นผู้ให้บริการวิเคราะห์ระดับความเข้มข้นของสารเคมีอันตรายในบรรยากาศของสถานที่ทำงานและสถานที่เก็บรักษาสารเคมีอันตราย ประกอบกับกฎกระทรวงการขึ้นทะเบียนและการอนุญาตให้บริการเพื่อส่งเสริมความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน พ.ศ. ๒๕๖๔ แห่งพระราชบัญญัติความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน พ.ศ. ๒๕๕๔ โดยมีบุคลากร จำนวน ๑๐ ราย และรายการเครื่องมือวิเคราะห์ จำนวน ๙ เครื่อง ดังรายละเอียดแนบท้ายใบอนุญาตนี้

ทั้งนี้ ตั้งแต่วันที่ ๑๔ มิถุนายน พ.ศ. ๒๕๖๘ ถึงวันที่ ๑๓ มิถุนายน พ.ศ. ๒๕๗๑

ให้ไว้ ณ วันที่ ๒๑ พฤษภาคม พ.ศ. ๒๕๖๘

(นายศักดิ์ศิลป์ ตุลาธร)
ผู้ตรวจราชการกรม ปฏิบัติราชการแทน
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน

เลขทะเบียนควบคุม
๓-๑๑-๐๒๐๒-๐๓๕-๐๒-๖๘

(ลงนาม).....(นายทะเบียน)
(นางสาวสุวดี ทวีสุข)
ผู้อำนวยการกองความปลอดภัยแรงงาน

รายชื่อบุคลากรแนบท้ายใบอนุญาต
เป็นนิติบุคคลผู้ให้บริการวิเคราะห์ระดับความเข้มข้นของสารเคมีอันตรายในบรรยากาศของสถานที่ทำงาน
และสถานที่เก็บรักษาสารเคมีอันตราย
ของบริษัท ซีคอท จำกัด
ใบอนุญาตเลขที่ ๐๒๐๒-๐๓-๒๕๖๕-๐๐๓๔

๑. นางสาวนริสา ภูวสรรเพ็ชญ์
๒. นางอารยา ทิพรักษ์
๓. นางสาวศิริวรรณ ฉิมสง่า
๔. นางสาวสุธาทิพย์ เทียนเตี้ย
๕. นางสาวพรนภา บุตรธรรม
๖. นางสาวธาริณี อาจปลิว
๗. นางสาวจณิสตา กุ้ยอ่อน
๘. นางสาวจุฑารัตน์ แจ่มเรือน
๙. นางสาวสุดาพร สุนทร
๑๐. นางสาวปวรีศา มากภักดี

ทั้งนี้ ตั้งแต่วันที่ ๑๔ มิถุนายน พ.ศ. ๒๕๖๘ ถึงวันที่ ๑๓ มิถุนายน พ.ศ. ๒๕๗๑

ให้ไว้ ณ วันที่ ๒๗ พฤษภาคม พ.ศ. ๒๕๖๘

(นายศักดิ์ศิลป์ ตุลาธร)
ผู้ตรวจราชการกรม ปฏิบัติราชการแทน
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน

รายการเครื่องมือวิเคราะห์แนบท้ายใบอนุญาต
เป็นนิติบุคคลผู้ให้บริการวิเคราะห์ระดับความเข้มข้นของสารเคมีอันตรายในบรรยากาศของสถานที่ทำงาน
และสถานที่เก็บรักษาสารเคมีอันตราย
ของบริษัท ซีคอท จำกัด
ใบอนุญาตเลขที่ ๐๒๐๒-๐๓-๒๕๖๕-๐๐๓๔

ลำดับที่	รายการเครื่องมือ	รายละเอียด		จำนวน (เครื่อง)
๑	Atomic Absorption Spectrophotometer (AAS)	ยี่ห้อ รุ่น Serial No.	Perkin Elmer PinAAcle 900T PTDS23051001	๑
๒	Inductively Coupled Plasma (ICP-OES)	ยี่ห้อ รุ่น Serial No.	Agilent 5110 MY16230003	๑
๓	Gas Chromatograph Flame Ionization Detecter (GC-FID)	ยี่ห้อ รุ่น Serial No.	Agilent 7890 B CN 15346147	๑
		ยี่ห้อ รุ่น Serial No.	Agilent 7890 A US10943001	๑
๔	Ion Chromatography	ยี่ห้อ รุ่น Serial No.	Dionex ICS-1000 04090295	๑
๕	Electronic Balance	ยี่ห้อ รุ่น Serial No.	Sartorius ME5, 6 digits SWB26602268	๑
		ยี่ห้อ รุ่น Serial No.	Mettler Toledo AG245, 5 digits 1117293916	๑
		ยี่ห้อ รุ่น Serial No.	Mettler Toledo AB204-S, 4 digits 1123163292	๑

ลำดับที่	รายการเครื่องมือ	รายละเอียด		จำนวน (เครื่อง)
๖	UV/Vis Spectrophotometer	ยี่ห้อ รุ่น Serial No.	Thermo Scientific GENESYS 150 UV-Vis 9A5Y332022	๑

ทั้งนี้ ตั้งแต่วันที่ ๑๔ มิถุนายน พ.ศ. ๒๕๖๘ ถึงวันที่ ๑๓ มิถุนายน พ.ศ. ๒๕๗๑

ให้ไว้ ณ วันที่ ๒๓ พฤษภาคม พ.ศ. ๒๕๖๘

(นายศักดิ์ศิลป์ ตุลาธร)
ผู้ตรวจราชการกรม ปฏิบัติราชการแทน
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน

ที่ รง ๐๕๐๔/ ๗๒๙๓

กรมสวัสดิการและคุ้มครองแรงงาน
ถนนมิตรไมตรี ดินแดง กรุงเทพฯ ๑๐๔๐๐

๒๐ สิงหาคม ๒๕๖๘

เรื่อง การขอเพิ่มเติมเครื่องมือวิเคราะห์ระดับความเข้มข้นของสารเคมีอันตรายในบรรยากาศของสถานที่ทำงานและสถานที่เก็บรักษาสารเคมีอันตราย

เรียน กรรมการผู้จัดการบริษัท ซีคอท จำกัด

อ้างถึง หนังสือบริษัท ซีคอท จำกัด ที่ ชค. (๒) ๐๐๒๙/๒๕๖๘ ลงวันที่ ๑๘ มิถุนายน ๒๕๖๘

สิ่งที่ส่งมาด้วย รายการเครื่องมือ (เพิ่มเติม) แนบท้ายใบอนุญาตเป็นนิติบุคคลผู้ให้บริการวิเคราะห์ระดับความเข้มข้นของสารเคมีอันตรายฯ ลงวันที่ ๒๐ สิงหาคม พ.ศ. ๒๕๖๘ จำนวน ๑ ชุด

ตามหนังสือที่อ้างถึง บริษัท ซีคอท จำกัด ขออนุมัติเพิ่มเติมเครื่องมือวิเคราะห์ระดับความเข้มข้นของสารเคมีอันตรายในบรรยากาศของสถานที่ทำงานและสถานที่เก็บรักษาสารเคมีอันตราย จำนวน ๑ เครื่อง สำหรับการเป็นผู้ให้บริการวิเคราะห์ระดับความเข้มข้นของสารเคมีอันตรายฯ ตามกฎกระทรวงการขึ้นทะเบียนและการอนุญาตให้บริการเพื่อส่งเสริมความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงาน พ.ศ. ๒๕๖๔ เพื่อให้กรมสวัสดิการและคุ้มครองแรงงานพิจารณา ความละเอียดแจ้งแล้ว นั้น

กรมสวัสดิการและคุ้มครองแรงงานพิจารณาแล้วเห็นว่า เครื่องมือวิเคราะห์ระดับความเข้มข้นของสารเคมีอันตรายฯ ที่ขออนุมัติเพิ่มเติม เป็นไปตามกฎกระทรวงการขึ้นทะเบียนและการอนุญาตให้บริการเพื่อส่งเสริมความปลอดภัยฯ ประกอบกับกฎกระทรวงกำหนดมาตรฐานในการบริหาร จัดการ และดำเนินการด้านความปลอดภัย อาชีวอนามัย และสภาพแวดล้อมในการทำงานเกี่ยวกับสารเคมีอันตราย พ.ศ. ๒๕๕๖ จึงอนุมัติให้บริษัท ซีคอท จำกัด เพิ่มเติมเครื่องมือวิเคราะห์ระดับความเข้มข้นของสารเคมีอันตรายฯ ดังกล่าว รายละเอียดปรากฏตามสิ่งที่ส่งมาด้วย ทั้งนี้ ขอให้บริษัทฯ ปฏิบัติตามกฎกระทรวงการขึ้นทะเบียนและการอนุญาตให้บริการเพื่อสงเสริมความปลอดภัยฯ อย่างเคร่งครัด

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายศักดิ์ศิลป์ ตุลาธร)
รองอธิบดี ปฏิบัติราชการแทน
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน

กองความปลอดภัยแรงงาน
โทรศัพท์ ๐ ๒๔๔๘ ๙๑๒๘ - ๓๙ ต่อ ๗๐๖
ไปรษณีย์อิเล็กทรอนิกส์ Safetyofficer@labour.mail.go.th

รายการเครื่องมือ (เพิ่มเติม)
แนบท้ายใบอนุญาตเป็นนิติบุคคลผู้ให้บริการวิเคราะห์ระดับความเข้มข้นของสารเคมีอันตราย
ในบรรยากาศของสถานที่ทำงานและสถานที่เก็บรักษาสารเคมีอันตราย
ของบริษัท ซีคอท จำกัด
ใบอนุญาตเลขที่ ๐๒๐๒-๐๓-๒๕๖๕-๐๐๓๕

ลำดับที่	รายการเครื่องมือ	รายละเอียด		จำนวน (เครื่อง)
๓	CO Gas Detector	ยี่ห้อ	Q-Trak	๑
		รุ่น	7575	
		Serial No.	7575X2017002	

ทั้งนี้ ตั้งแต่วันที่ ๒๐ สิงหาคม พ.ศ. ๒๕๖๘ ถึงวันที่ ๑๓ มิถุนายน พ.ศ. ๒๕๗๑

ให้ไว้ ณ วันที่ ๒๐ สิงหาคม พ.ศ. ๒๕๖๘

(นายศักดิ์ศิลป์ ตุลาธร)
รองอธิบดี ปฏิบัติราชการแทน
อธิบดีกรมสวัสดิการและคุ้มครองแรงงาน

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